Great Yarmouth Third River Crossing

Application for Development Consent Order

Document 6.2: Environmental Statement Volume II: Technical Appendix 11B: Impact Assessment Criteria for Surface Water and Groundwater

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ("APFP")

APFP regulation Number: 5(2)(a)

Planning Inspectorate Reference Number: TR010043

Author: Norfolk County Council

Document Reference: 6.2 – Technical Appendix 11B

Version Number: 0 – Revision for Submission

Date: 30 April 2019

CONTENTS PAGE No.

Tables

1 Impact Assessment Criteria for Surface Water and Groundwater

Table 1.1: Receptor Importance / Sensitivity

Importance	Criteria	Example
Very High	Attribute has a high quality and rarity on regional or national scale	• Large or medium watercourses with pristine / near pristine water quality, i.e. Water Framework Directive (WFD) Class 'High'.
		• Site protected/designated under EU or UK habitat legislation: Special Areas of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interests (SSSI), Water Protection Zone (WPZ), Ramsar site, species protected by EU legislation.
		• Watercourses supporting a wide range of significant species and habitats sensitive to changes in suspended sediment concentrations and turbidity such as salmon or freshwater pearl mussels. Water dependent ecosystems of international/national biodiversity value.
		• Water feature sediment regime provides a diverse mosaic of habitat types.
		• Water feature includes varied morphological features (e.g. pools, riffles, bars, natural bank profiles) with no sign of channel modification.
		• A watercourse or groundwater body and associated abstraction boreholes used for public water supply or private water supply serving >10 properties.
		• Principal Aquifer providing a regionally important resource or supporting site protected under EC and UK habitat legislation.
		• Source Protection Zone (SPZ) 1.

Importance	Criteria	Example
		• Water body of high amenity value, including areas of bathing and where water emersion sports are regularly practised.
High	Attribute has a high quality and rarity on local scale	• Medium or small watercourses with minor degradation of water quality as a result of anthropogenic factors. Water body of good chemical and biological quality i.e. WFD Class 'Good'.
		• Species protected under UK legislation
		• Water dependent ecosystems of regional/county biodiversity value. Watercourses supporting some species and habitats sensitive to changes in suspended sediment concentrations and turbidity.
		• Water feature sediment regime provides habitats suitable for species sensitive to changes in sediment concentration and turbidity.
		• Water feature exhibiting a natural range of morphological features (e.g. pools, riffles, bars, varied natural river bank profiles), with limited signs of artificial modifications or morphological pressures.
		• A watercourse or groundwater body and associated abstraction boreholes supporting minor/non-critical public drinking water supplies, or private water supply serving 2-10 properties.
		• Principal Aquifer providing locally important resource or supporting river ecosystem.
		• SPZ 2.

Importance	Criteria	Example
		• Water body of a moderate amenity value including public parks, boating, non-contact water sports, popular footpaths adjacent to watercourses, or watercourses running through housing developments/town centres.
Medium	Attribute has a medium quality and rarity on local scale	• Small watercourses with degradation of water quality as a result of anthropogenic factors. WFD Class of 'Moderate'.
		• Water dependent ecosystems of county/district biodiversity value.
		• Watercourses supporting limited species and habitats sensitive to changes in suspended sediment concentrations and turbidity.
		• Water feature sediment regime provides some habitat suitable for species sensitive to change in suspended sediment concentrations or turbidity.
		• Water feature exhibiting some morphological features (e.g. pools, riffles and depositional bars). The channel cross-section is partially modified in places, with obvious signs of modification to the channel morphology.
		• A watercourse or groundwater body and associated abstraction boreholes supporting a private water supply serving a single property, or for agricultural/industrial use.
		• Aquifer with limited connection to surface water.
		• SPZ 3.
		• Water body of particular local social/cultural/educational interest. Water body of low amenity value with only casual access, e.g. along a road or bridge in a rural area.

Importance	Criteria	Example
Low	Attribute has a low quality and rarity on local scale	• Small, heavily modified watercourses or drains with poor water quality as a result of anthropogenic factors.
		• Water of poor or bad chemical or biological quality, i.e. WFD Class of 'Poor' or 'Bad'.
		• Water dependent ecosystems of local/less than local biodiversity value.
		• Watercourses which do not support any significant species and habitats sensitive to changes in suspended sediment concentrations and turbidity.
		• Water feature sediment regime which provides very limited physical habitat for species sensitive to changes in suspended solids concentration or turbidity.
		• Water feature that has been extensively modified (e.g. by culverting, addition of bank protection or impoundments) and exhibits limited-to-no morphological diversity. The water feature is likely to have uniform flow, uniform banks and absence of bars. Insufficient energy for morphological change.
		• Watercourses not supporting water abstractions.
		• Borehole without abstractions.
		• Non-Aquifer.
		• Water body of no amenity value, seldom used for amenity purposes, in a remote or inaccessible area.

Table 1.2: Impact Magnitude

Magnitude	Criteria	Example
Major Adverse	Results in loss of attribute and / or quality and integrity of the attribute	• High risk of pollution to surface water during construction, significant temporary or long-term change in water quality, resulting in a permanent change in WFD status. Preventing attainment of target overall status of 'Good' in the absence of other factors unrelated to the scheme.
		• Failure of both soluble and sediment bound pollutants in Highways Agency Water Risk Assessment Tool (HAWRAT) and Environmental Quality Standard (EQS) routine runoff compliance failure.
		• Risk of pollution from accidental spillage during operation > 2% annually.
		• Results in loss of feature(s) and failure of hydromorphological elements (morphology, quantity and dynamics of flow). Loss or damage to existing habitats. Significant/extensive alteration to channel planform and/or cross section. Significant shift away from baseline conditions with potential to alter natural fluvial processes at the catchment scale.
		• Significant impacts on the water feature bed, banks and vegetated riparian corridor resulting in changes to sediment characteristics, transport processes, sediment load and turbidity.
		• Permanent loss of surface water supply.
		• Loss of, or extensive change to, an aquifer/groundwater supported designated wetlands.
		• Extensive change to pumping rate and water quality in abstraction wells.

Magnitude	Criteria	Example
		• Potential high risk of pollution to groundwater from routine runoff (Method C score >250).
		• High risk of pollution to groundwater during construction, significant temporary or long-term change in water quality, resulting in a permanent change in WFD status. Preventing attainment of target overall status of 'Good' in the absence of other factors unrelated to the scheme.
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute	• Moderate risk of pollution to surface water during construction, moderate temporary change in water quality, resulting in a temporary change of WFD status or contributing to preventing attainment of target overall status of 'Good'.
		• Failure of both soluble and sediment bound pollutants in HAWRAT routine runoff but compliance with EQS limits.
		• Risk of pollution from accidental spillage during operation > 1% annually.
		• Some changes and impacts on the water feature bed, banks and vegetated riparian corridor resulting in some changes to sediment characteristics, transport processes, sediment load and turbidity.
		• Some alteration to channel planform and/or cross section, including modification to bank profiles or the replacement of a natural bed. A shift away from baseline conditions with potential to alter natural fluvial processes.
		• Temporary loss of water supply.
		• Partial loss or change to an aquifer/groundwater supported designated wetlands.
		• Partial change to pumping rate and water quality in abstraction wells.

Magnitude	Criteria	Example
		• Potential medium risk of pollution to groundwater from routine runoff (Method C score 150 - 250).
		• Moderate risk of pollution to groundwater during construction, temporary or moderate long-term change in water quality, resulting in a temporary change in WFD status or contributing to preventing attainment of target overall status of 'Good'.
Minor Adverse	Results in some measurable change in attribute's quality or vulnerability	• Minor risk of pollution during construction to surface water, relatively minor temporary changes in water quality such that ecology is temporarily affected. Equivalent to a temporary minor, but measurable, change within WFD status class.
		• Failure of either soluble or sediment bound pollutants in HAWRAT routine runoff but compliance with EQS limits.
		• Risk of pollution from accidental spillage during operation > 0.5% annually.
		• Limited impacts on the water feature bed, banks and vegetated riparian corridor resulting in limited (but notable) changes to sediment characteristics, transport processes, sediment load and turbidity.
		• A small change or modification in the channel planform and/or cross section. Minimal shift away from natural fluvial baseline conditions with typically localised impacts.
		• Temporarily reduced quality of water supply.
		• Temporary change to pumping rate and water quality in abstraction wells.
		• Potential low risk of pollution to groundwater from routine runoff (Method C score <150).

Magnitude	Criteria	Example
		• Minor risk of pollution to groundwater during construction, temporary change in water quality with temporary effects on groundwater dependent systems. Equivalent to a temporary minor, but measurable, change within WFD status class.
Negligible Adverse	Results in effect on attribute, but of insufficient magnitude to affect the use of integrity	• Negligible risk of pollution to surface water during construction, very slight temporary change in water quality with no discernible effect on watercourse ecology or water supply.
		• All elements of HAWRAT and EQS routine runoff assessments passed.
		• Risk of pollution from accidental spillage during operation < 0.5% annually.
		• Minimal or no measurable change from baseline conditions in terms of sediment transport, channel morphology and natural fluvial processes. Any impacts are likely to be highly localised.
		• No measurable impact upon an aquifer.
		• Negligible risk of pollution to ground water during construction, very slight temporary change in water quality with no discernible effect on dependent systems or water supply.
		• No measurable change to pumping rate and water quality in abstraction wells.
No Change	Results in no change to the receptor	• No predicted adverse or beneficial impact to the receptor.
Negligible Beneficial	Results in beneficial effect on attribute, but of insufficient	• The scheme options may beneficially affect the integrity of the water environment, but this is not considered measurable.
		• No measurable impact upon an aquifer.

Magnitude	Criteria	Example
	magnitude to affect the use of integrity	
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring	• Potential for slight reduction in pollution to a surface water or groundwater body, but insufficient to cause noticeable benefit in quality, fishery productivity or biodiversity.
Moderate Beneficial	Results in moderate improvement of attribute quality	• Moderate improvement to a fishery/designated nature conservation site. Potential increase in the productivity of a fishery.
		• Reduced pollution of a receiving water body, but insufficient to change the environmental status/classification, including water quality classification.
Major Beneficial	Results in major improvement of attribute quality	• Significant improvement to a fishery/designated nature conservation site.
		• Removal of existing polluting discharge, or removing the likelihood of polluting discharges occurring.
		• Change to the environmental status/classification of a water feature, including water quality classification.