

Water Framework Directive Assessment (RAPID Gate Two)

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South Lincolnshire Reservoir

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Executive summary

This Water Framework Directive (WFD) assessment supports the Environmental Assessment Report (EAR) that accompanies the gate two submission to the Regulators' Alliance for Progressing Infrastructure Development (RAPID) for the South Lincolnshire Reservoir (SLR) Strategic Resource Option (SRO). This report presents the findings of the WFD assessment for all the scheme elements including: abstraction, conveyance including pumps, storage, treatment and distribution into supply and the reservoir. 1

The two-stage WFD assessment follows the approach outlined in the All Company Working Group (ACWG) framework for undertaking WFD assessments for SROs (ACWG, 2020).

Level 1 assessment identified 24 waterbodies which could potentially be affected by the scheme. Following the Level 1 assessment, seven of these waterbodies were identified as requiring further assessment, due to the potential effects on the WFD waterbodies.

The findings from the Level 2 assessment are:

- A potential major adverse risk (risk of deterioration) to the Swaton Drains (ID: GB105030056515) has been identified. Within the reservoir footprint over 2.5km of open channel would be lost, along with 28% of the catchment. The loss of open channel would impact on habitat, flow and hydromorphology in this waterbody.
- A potential minor localised risk (no risk of deterioration) to the South Beck (ID: GB105030056520) has been identified from the loss of open watercourse and loss of up to 4% of open watercourse within the catchment due to the presence of the reservoir. This loss of catchment and watercourses would impact on habitat, flow and hydromorphology in this waterbody.
- A potential major adverse risk (risk of deterioration) to the Trent from Soar to Beck (ID: GB104028053110) was identified as a result of the new surface water abstraction. Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. A potential adverse risk was also identified due to potential for changes in water quality due to the surface water abstraction.
- A potential major adverse risk (risk of deterioration) to the Witham conf Cringle Bk to conf Brant (ID: GB105030056780) has been identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the proposed transfer was conducted, it concludes there is an expected 69% increase in ammonia.
- A potential major adverse risk (risk of deterioration) to the Witham conf Brant to conf Catchwater Drain (ID: GB105030062370) and the Witham - conf Catchwater Drain to conf Bain (ID: GB205030062425) have been identified as a result of the discharge into the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780). A high-level water quality assessment concludes there is an expected 46% increase in phosphate by the time it reaches both catchments.
- A potential major adverse risk (risk of deterioration) to the Lower Witham conf Bain to Grand Sluice (ID: GB205030062426) has been identified as a result of the discharge from the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780). A high- level water quality assessment, concludes there is an expected 46% increase in phosphate by the time it reaches the catchment. A potential adverse effect (risk of deterioration) was also identified for biological status elements due to the transfer of water from

upstream and subsequent abstraction at this waterbody leading to changes in water velocity and level, which could impact on biological status elements.

Further WFD assessment will be required during the next stages of project development (i.e. for gate three and beyond) to improve the levels of certainty for the WFD related risks outlined in this assessment, and to identify mitigation where required.

1 Introduction

1.1 Overview

This report supports the Environmental Appraisal for the scheme as part of the South Lincolnshire Reservoir (SLR) Strategic Resource Option (SRO) gate two submission to the Regulators' Alliance for Progressing Infrastructure Development (RAPID). It presents the findings of the Water Framework Directive (WFD) assessment of the scheme.

1.2 South Lincolnshire Reservoir

A new strategic reservoir in Lincolnshire, referred to as the South Lincolnshire Reservoir (SLR), has been proposed for development as one of several nationally strategic water resource options required to address increasing deficits in public water supply. The scheme is being is promoted by Anglian Water and is being progressed through the fast-tracked delivery framework overseen by the Regulatory Alliance for Progressing Infrastructure Development (RAPID).

The SLR has previously progressed through gate one in 2021, the first opportunity to check progress on investigations and development of solutions in the gated process and is now at gate two. Gate two is intended to look at solutions in more detail, with focus on ensuring that funding for continued investigation and development of solutions is aligned to water resources planning.

This report presents a scheme wide WFD assessment including: abstraction, conveyance including pumps, storage, treatment and distribution into supply and the reservoir.

1.3 Scheme overview

The proposed reservoir site is located in the South Lincolnshire area. It is located approximately 7km southeast of the town of Sleaford, between the settlements of Swaton, Scredington and Helpringham in the North Kesteven District Council area. At its greatest dimensions the reservoir is approximately 2.6km wide and 3.2km long to the embankment toe. This is based on the initial concept design and is subject to further work at gate three.

It is proposed that water will be abstracted from the River Witham, from a location assumed to be between Chapel Hill and Langrick Bridge. It is proposed that flow in the River Witham will be supported via a transfer from the River Trent. The intake is currently assumed to be near Newark-on-Trent and transferred to River Witham near Claypole.

Further details on the scheme are set out in Section 2.

1.4 Methodology

1.4.1 Approach to WFD assessment for SROs

The Water Framework Directive (WFD) is transposed into law for England and Wales through *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003* and updated in 2017¹.

The WFD requires all waterbodies (both surface and groundwater) to achieve 'good status or potential'. The Directive also requires that waterbodies experience no deterioration in status or

¹ https://www.legislation.gov.uk/uksi/2017/407/made

potential. Good status/potential is a function of good ecological status/potential (biological, physico-chemical and hydromorphological elements and specific pollutants) and good chemical status (Priority Substances and Priority Hazardous Substances).

The All Company Working Group (ACWG)² has developed a consistent framework for undertaking WFD assessments for SROs to demonstrate that options will not cause deterioration in status/potential of any WFD waterbodies. The assessment considers mitigation that would need to be put in place to protect waterbody status/potential. The assessment also considers WFD future objectives to ensure the option would not preclude affected WFD waterbodies from reaching good status/potential.

Two stages of assessment are completed under the ACWG WFD approach, an initial Level 1 basic screening and a Level 2 detailed impact screening. These are conducted/reported using a spreadsheet assessment tool which is automated based on option information for Level 1 and expert judgment for Level 2.

This report includes the WFD assessment of the reservoir footprint, abstractions, discharges, and transfers associated with the potential reservoir.

1.4.2 Level 1 – basic screening

Level 1 assessment follows these steps:

- Identify affected waterbodies
- Review SRO option information
- Identify possible impacts
- Apply 'embedded' mitigation measures
- Calculate screening score (using a 6-point scale see Table 1.1) to 'screen out' waterbodies and options with no or minor localised (no risk of deterioration) potential impacts from further assessment (score of 1 or less).

The process involves the identification of all activities involved in construction, operation and decommissioning for the SRO and identification of all WFD waterbodies which these activities may affect.

Following this, each activity is automatically assigned an impact score using the predetermined scores, as outlined in Table 1.1. The scores assumes some basic embedded mitigation is applied. If these mitigation measures do not apply or further measures are included in the design, then the impact score can be reassessed and the score manually updated. The mean and maximum impact score is then calculated for each waterbody. If the maximum impact is 1 or less, then the waterbody is not to be considered further and no further action is needed. If the maximum impact score is greater than 1 (i.e. there is the potential for deterioration at a waterbody scale) then the waterbody is taken forward into the level 2 assessment.

The outcomes of the Level 1 assessment are summarised in Section 5.1 and Appendix A. Where waterbodies and option impacts were 'screened in', they have been taken forward to the Level 2 assessment.

² All Company Working Group (Nov 2020). Water Framework Directive: Consistent framework for undertaking no deterioration assessments

Impact	Score	Description
Very beneficial	-2	Impacts that, taken on their own, have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody.
Beneficial	-1	Impacts that, when taken on their own, have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements.
No/minimal	0	No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved.
Low	1	Impacts that, when taken on their own, have the potential to lead to a minor localised, short-term and fully reversible effects on one or more of the quality elements but would not result in the lowering of WFD status. Impacts would be very unlikely to prevent any target WFD objectives from being achieved.
Medium	2	Impacts that, when taken on their own, have the potential to lead to a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status. Impacts have the potential to prevent target WFD objectives from being achieved.
High	3	Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status. Potential for high impact on preventing target WFD objectives from being achieved.

Table 1.1: Impact scoring system used for WFD assessment

1.4.3 Level 2 – detailed impact assessment

The second stage of WFD assessment has been completed for waterbodies in the scheme that were screened in at Level 1, following the next steps:

- Waterbody scale detailed assessment of impacts to each WFD quality element (biological quality elements, hydromorphological supporting elements, physio-chemical quality elements, priority hazardous substances, priority substances and specific pollutants) of the footprint of the proposed site³.
- Assessment of data confidence level and design certainty confidence levels are assigned for each assessment, based on professional judgement of the quality and availability of both physical data and design information about the option at the time of assessment. Requirements for further investigations, data and/or design information required in order to raise the level of confidence for future gates is listed in the WFD assessment (Level 2 summary).
- Identification of further mitigation needs.
- Assessment of impacts after mitigation (scoring on a 6-point scale).
- Identification of activities to improve the certainty of assessment outcomes.

The outcomes of the Level 2 assessments are summarised in Section 5.2 and Appendix B.

1.4.4 WFD for gate three and beyond

Where waterbodies and option impacts have been identified, recommendations have been made for mitigation and increasing the confidence in the assessment. This is expected to be through increasing the level of detail available during later stages of the development of the scheme and for subsequent gateways if the option is progressed. Both the Level 1 and 2 WFD assessment will be updated at gate three following updated design information.

³ Gate one assessed all activities associated with the SLR SRO, however a change in scope has resulted in the WFD only assessing the reservoir footprint only.

It is noted that the Cycle 3 River Basin Management Plans (RBMPs) are due to be published in 2022, which may bring about changes in the baseline status and objectives for waterbodies. Where necessary, changes will need to be accounted for in updates to the WFD assessments.

1.5 Assumptions and limitations

Due to the level design information at this stage the WFD assessment has the following limitations and assumptions:

- The ACWG approach uses WFD 2015 data, as it is the current officially reported baseline in the Anglian region RBMP Cycle 2 (2015-2021)⁴. The RBMPs are anticipated to be updated in 2022, and 2019 WFD baseline data released in late 2020 would then become the new baseline. For consistency, the 2015 data has been used at Gate 1 and 2; but it is acknowledged that this will need to be updated to the 2019 status, once the RBMPs are published (proposed for gate three).
- Where there is no data available for the WFD element, this has not been assessed as part of the Level 2 WFD assessment.
- Decommissioning of the reservoir and transfers have not been assessed as part of the gate two assessment.
- It is assumed the Water Treatment Works (WTW) will only treat water from the reservoir and will not discharge to a local watercourse.
- It is assumed bund will contain a core of low permeability material, which will limit connection between the reservoir and local watercourses, excluding where formal discharges maybe present.
- If dewatering is required, a permit will need to be obtained from the EA. It is assumed the
 permit will cover water quality to ensure it is suitable to discharges into the
 watercourses.
- The geographical extent of the WFD assessment has been limited to waterbodies where construction activities are taking place.
- This assessment only takes into account the waterbody where the abstraction is located on the River Trent and River Witham. Consideration of the impacts on waterbodies downstream and the associated impacts of the abstraction will be included during the next stages of project development, following further investigation.
- This option includes a transfer of water between the River Trent and River Witham. Water is discharged into the River Witham, and then abstracted further downstream from the River Witham to supply the SLR. This assessment considers all the River Witham waterbodies between the abstraction and discharge locations.
- At the time of writing, the emergency draw down design has not been completed as multiple options are under consideration. The emergency draw down has therefore been excluded from this WFD assessment. It is expected that this will be included within the WFD assessment at the gate three once the design has been finalised.

⁴ Environment Agency (2016) Anglian RBMP. Available at: <u>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718327/Anglian_RBD_Part_1_riv</u> <u>er_basin_management_plan.pdf</u>

2 Scheme Description

2.1 Scheme overview

The SLR scheme includes the development of a new embanked raw water reservoir for water storage for public water supply. It also comprises abstractions from the River Witham and River Trent, raw water transfers, treatment works, and distribution into supply.

Key scheme parameters include:

•	River Trent maximum abstraction and transfer flow to River Witham: (Megalitres per day)	300MI/d
•	River Witham maximum abstraction and transfer flow to reservoir:	400MI/d
•	Reservoir total capacity:	55MCM
•	Reservoir usable volume:	50MCM
•	Treatment distribution flow ⁵ :	150Ml/d

2.1.1 Reservoir overview

The proposed reservoir site is shown in Figure 2.1, and is located approximately 7km southeast of the town of Sleaford, between the settlements of Swaton, Scredington and Helpringham in the North Kesteven District Council area. South Kesteven District Council's administrative boundary is approximately 100m south of the polygon, south of the A52 Holland Road. The Peterborough to Lincoln railway line runs along the north-eastern boundary with the North Beck watercourse situated just north of the site boundary.

An indicative concept plan has been developed for the scheme. This indicative concept has been established to provide reference for cost and carbon estimation in gate two. The summary provisional details are provided below, but much work is still required to develop the scheme and the final details will develop accordingly.

The provisional reservoir parameters are as follows:

- At its greatest dimensions the reservoir is 2.6km wide and 3.2km long to the embankment toe.
- The embankment crest is estimated at 26m AOD making the embankment an average of 14m above the existing ground level at the toe, a maximum of 15.1m and a minimum of 3.7m above existing ground levels.
- The total perimeter length of the crest is approximately 8.5km and the estimated reservoir surface area is 4.8km².

The reservoir would include key infrastructure necessary for its safe operation, including intake and outtake structures; drawdown facilities; a spillway and water sampling facilities. The reservoir will also be expected to provide benefits beyond public water supply. Opportunities to incorporate facilities to enable recreation (such as a visitor centre and parking), infrastructure to improve health and wellbeing (such as multi-use footpaths, quiet areas and leisure opportunities) and careful design to enhance and encourage biodiversity are planned and will be developed further, with the features that would deliver these wider benefits being subject to further assessment and consultation. Landscaping would be carefully designed surrounding the

⁵ The proposed capacity of the water treatment works and transfer pipelines has been updated since this assessment was completed. The figures quoted in the gate two report include a scheme deployable output of 166MI/d and works capacity up to 180MI/d. These changes are not anticipated to have any material impact on the completed assessments.

reservoir to minimise the visual impact of the reservoir whilst ensuring it sits within the existing landscape and delivers wider recreational and biodiversity benefits.

Figure 2.1: Site context map



2.1.2 Raw water abstraction and transfers

It is proposed that water will be abstracted from the River Witham. The abstraction location has currently been assumed, for indicative purposes, to be at an intake between Chapel Hill and Langrick Bridge. The precise abstraction location will be identified following further detailed work (including stakeholder engagement) for gate three. The current design includes the transfer of water into the reservoir by about 18km of 1600mm (millimetres) diameter steel pipeline.

However, the precise abstraction location will be identified following further detailed work (including stakeholder engagement) for gate three. The proposed abstraction rate from the River Witham is up to 400MI/d when flows allow. This is subject to further assessment undertaken in collaboration with the Environment Agency (EA) to develop an abstraction rate which is licensable. The associated abstraction licence is expected to stipulate a minimum flow and minimum water level requirement at the point of abstraction below which it would not be possible to abstract. Abstraction to fill the reservoir would only be possible during high flow periods.

It is proposed that flows in the River Witham would be supported via a transfer from the River Trent. Up to 300MI/d would be abstracted from the River Trent, with an intake currently assumed for indicative purposes to be located near Newark-on-Trent (although, as with the River Witham abstraction, the precise abstraction location will be identified following further detailed work for gate three) and transferred by about 10km of 1400mm diameter steel pipeline to the River Witham near Claypole. Without mitigation, there is a risk of INNS transferring between catchments (see EAR).

The current design includes the transfer of water into the reservoir by about 18km of 1600mm (millimetres) diameter steel pipeline. The potential for the raw water transfer to the reservoir from the River Witham into the South Forty Foot Drain (SFFD) and then into the reservoir, using open channel, to deliver additional benefits has been identified as an opportunity. This opportunity is being investigated further and will be confirmed during the next stage of project development.

Further work is planned for the next stage to confirm the locations of the abstraction points and routes for the transfers. This will involve landowner engagement, environmental surveys, and preliminary ground investigations. The information provided in this report and accompanying appendices are assumptions based on indicative locations only at this stage. The indicative transfer routes for are shown in Figure 2.2.

The abstraction facilities are expected to comprise an intake structure, a transfer pumping station (TPS) and pipeline.

2.1.3 Water treatment and potable transfers

Stored water will subsequently be abstracted from the reservoir and treated to a potable quality. It is proposed that a WTW is located on land adjacent to the reservoir with a peak throughput capacity of 180MI/d.

It is proposed that the treated water will be transferred by an approximate 37km 1100mm diameter steel pipeline into the potable supply network by an existing Anglian Water Service Reservoir. The reservoir is to supply over 500,000 homes in Lincolnshire and the south-west of the Anglian region.

Further work is planned for the next stage to confirm the routes for the transfers involving landowner engagement, environmental surveys, and preliminary ground investigations. The information provided in this report and accompanying appendices are assumptions based on indicative locations only at this stage.

See Figure 2.2 for an illustration of indicative proposed transfer corridor locations.

Figure 2.2 Proposed transfer corridors



2.1.4 Summary of operation and use

Development and operation of the reservoir will be subject to the Reservoirs Act 1975 (as amended by the Floods and Water Management Act 2010). The embankments and associated water retaining elements of the reservoir will need to be maintained and supervised in accordance with the Act to maintain public safety.

Provision of emergency drawdown must be designed in accordance with the Reservoirs Act. The proposed solution at this stage is to discharge to the SFFD, but this is to be further modelled and confirmed as part of the next stage of development. Although the risk of needing to fully drawdown the reservoir is very low, there is a need for regular testing and maintenance to confirm functionality. This will involve the opening and testing of relevant valves and gates. Test flows are envisaged to be held in a pond to avoid disruption and to enable water to be returned to the reservoir.

The operation and maintenance of the water treatment works and the distribution water supply system inclusive of distribution pump stations are expected to be in constant regular use according to water supply demand. The water supply components will need regular inspections and maintenance activities in accordance with the requirements of the respectively installed equipment.

2.1.5 Associated infrastructure and features

It is proposed that there will be a need for associated infrastructure and other features such as environmental mitigation to minimise the impacts of the reservoir, as well as enhancement opportunities. The location and design of the additional infrastructure has not been established and will therefore need to be confirmed at the next phase of scheme development.

3 Changes since gate one

A site selection process has been undertaken to determine the proposed site for the SLR SRO option, which has been put forward to the RAPID gate two submission. This process has identified and assessed potential site locations against the following criteria: planning, community, environmental, economic and technical criteria (constraints and opportunities). The iterative approach was aligned with relevant legislation and national and local planning policy, including the draft National Policy Statement for Water Resources Infrastructure. Local planning authorities and statutory stakeholders have been consulted on the methodology, and local stakeholders have been engaged through the South Lincolnshire Water Partnership.

Following completion of the gate one WFD assessment in 2021, the proposed reservoir location has been selected, and further design development work has continued. This has allowed the list of waterbodies requiring further WFD assessment to be refined for gate two.

Reservoir and transfers

- South Beck GB105030056520
- Swaton Drains GB105030056515

Transfers only

- Brook Drain (including Marholm Brook) GB105031050595
- The Fleet Upper Catchment (tributary of Trent) GB104028053430
- Black Sluice IDB draining to the South Forty Foot Drain GB205030051515
- Ousemere Lode GB105030056490
- Slough Dyke Catchment (tributary of Trent) GB104028053111
- Billingborough Lode GB105030056480
- Pointon Lode GB105030051555
- Old Beck GB105030051540
- Glen GB105031050720
- Vernatt's Drain GB205031050705
- Welland confluence of Gwash to confluence of Greatford Cut GB105031050600
- Welland confluence of Greatford Cut to tidal GB205031050685
- Maxey Cut GB205031050595
- Lower Trent Erewash (Secondary Combined) groundwater body GB40402G990300
- Witham Lias groundwater body GB40502G401400
- Cornbrash groundwater body GB40502G445000

Abstraction only

• Trent from Soar to The Beck - GB104028053110

Discharge only

• Witham - conf Cringle Bk to conf Brant- GB105030056780

Abstraction and transfer of discharged water from the abstraction at the River Trent

• Lower Witham - conf Bain to Grand Sluice - GB205030062426

Transfer of discharged water from the abstraction at the River Trent

- Witham conf Brant to conf Catchwater Drain GB105030062370
- Witham conf Catchwater Drain to conf Bain GB205030062425

4 Supporting Technical Assessment

This section summarises supporting technical assessments that have influenced the gate two assessment. Ongoing workstreams, baseline data collection and analysis during gate two include, but not limited to, selection of the proposed site (as stated in Section 3), and hydraulic and hydro-ecology survey, modelling and monitoring.

4.1 Gate one assessment

Mott MacDonald carried out a Level 1 and Level 2 WFD Assessment for gate one in 2021, which assessed the risk of deterioration or impeding achieving 'Good status' to a WFD waterbody based on various SLR options that were outlined in the optioneering phase. The findings indicated that there were precautionary WFD compliance risks associated with the abstractions and intakes.

4.2 Preferred site selection

In June 2022, strategic assessments were carried out on the short list of four location options to help identify the proposed site. These assessments considered only the reservoir footprints and were based on the preliminary design information available at the time. The assessment for the proposed site has been used as the basis for this latest proposed site assessment.

4.3 Level 1 WFD assessment for transfers

The transfers considered consists of:

- Construction of a pipeline, approximately 10km in length to transfer water from River Trent to River Witham
- Construction of a pipeline, approximately 18km in length, to transfer water from River Witham to South Lincolnshire reservoir
- Construction of a pipeline, approximately 37km in length to transfer water from South Lincolnshire reservoir to Water Treatment Works in Peterborough

The following assumptions were made in the assessment of this transfer route:

- Operation and maintenance of the transfers were omitted from this assessment as the design and operation of the transfers is yet to be determined. An assessment of which will be undertaken at a later design stage.
- Regarding the construction methods of the transfers, trenchless construction methods will be employed when crossing main rivers, watercourses, and watercourse links. The remaining lengths will be installed using trenching and laying methods.
- If the watercourse needs to be temporarily diverted, appropriate measures will be in put in
 place to protect ecology and watercourse will be returned to its natural state.
- It is assumed that appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column.

Based on these assumptions made, the transfers do not have the potential to cause deterioration to WFD status within waterbodies that interface with the transfer network. Therefore, none of the waterbody catchments required a Level 2 assessment, where the transfer is the sole design element (see Section 5.1).

4.4 Hydro-ecology

Mott MacDonald carried out an informal Stage 2 Habitat Regulations Assessment (HRA)⁶ in June 2022 and concluded that no residual effects remain on designated sites for the construction phase of the scheme at The Wash SPA/Ramsar Site and The Wash and Norfolk Coast SAC, assuming that all proposed mitigation is implemented. However, adverse effects for the operational phase cannot be ruled out, as the potential adverse effects of increased sedimentation and changes in water levels and flows and are currently unknown.

In June 2022, Mott MacDonald carried out a Hydro-ecology study to consider implications on aquatic habitats and species. This study concluded the following:

- The abstractions would only result in significant flow reduction during high-discharge
 periods in winter. Summer flows during high-discharge periods would not be
 significantly affected. On the basis of current modelled scenarios, water transfer from
 the River Trent would result in dramatic flow increases in the River Trent, throughout the
 year, with proportionately greater impact in the summer. The increase would be most
 pronounced at the point of transfer into the River Witham, and the effect would be
 reduced with distance downstream.
- Changes in flow because of the scheme have the potential to impact water depths and velocities at barriers along the watercourse, ultimately rendering barriers less passable for all of the fish species identified in this study.
- For aquatic communities, the impacts are pronounced at Claypole and gradually reducing in magnitude with distance from the discharge point. There is potential for a reduced impact on fish species further downstream of the discharge point as the results from the hydrological analysis suggest the increase in flow will be significantly reduced in comparison to the baseline.

4.5 Water quality modelling

Mott MacDonald conducted Soil and Water Assessment Tool (SWAT) modelling of phosphorus. This study concluded that:

- Transferring water from the River Trent to the River Witham to support flow and abstraction in the River Witham results in higher orthophosphate concentrations at the River Trent (Langrick Bridge) abstraction point.
- Transferring water from the River Trent to the River Witham during the summer results in a greater increase in phosphorus load at River Trent (Langrick Bridge) than transferring at the same rate during autumn and winter. This is a result of reduced dilution of phosphorus, mostly from point sources during the summer when flows are lower in both the River Trent and River Witham.

⁶ Mott MacDonald, 2022. SLR Reservoir Informal Habitats Regulations Assessment (HRA), June 2022.

5 WFD Assessment

5.1 Level 1 assessment

Table 5.1 provides the colour-coding matrix applied to identify if waterbodies are screened in or out of further assessment. Further information on WFD classification and the approach adopted can be found in *ACWG*, *WFD*: *Consistent framework for undertaking no deterioration* assessments, Nov 2020⁷.

Table 5.1: Level 1 WFD screening classification

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Green – Passes Level 1 WFD, no further assessment (score 1 or less)
Amber – Level 1 WFD score greater than 1, screened in for Level 2
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A WFD assessment has been produced for the scheme. Table 5.2 provides a summary of the gate two Level 1 WFD assessment and provides context relating to the waterbodies affected. Of the WFD waterbodies that have been identified, full details are included in Appendix A.

⁷ ACWG (2020). Water Framework Directive: Consistent framework for undertaking no deterioration assessments, November 2020.

Table 5.2: Level 1 WFD assessment summary (waterbody screening)

Waterbody ID	Maximum impact score / screening outcome	Comment
GB105030056515 - Swaton Drains	3	Headwaters of the main watercourse is located within the reservoir footprint, leading to the loss of a significant percentage of the catchment and several open channels. A new transfer will be located within this catchment. A new WTW will be located within this catchment.
GB105030056520 - South Beck	3	Reservoir located in this waterbody, leading to the loss of catchment and several open channels. Main watercourse located downstream of the reservoir. A new transfer will be located within this catchment.
GB104028053110 – Trent from Soar to Beck	3	A new surface abstraction, intake structure and pipeline will be located within this catchment, leading to reductions in flow in this water course
GB105030056780 – Witham – conf Cringle Bk to conf Brant	3	A new discharge and transfer will be located within this catchment, leading to the potential for changes in flow and water quality.
GB104028053111 – Slough Dyke Catchment (trib of Trent)	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105030062370- Witham conf Brant to conf Catchwater Drain	2	Discharge in upstream catchment, leading to the potential for changes in flow and water quality.
GB205030062425 – Witham – conf Catchwater Drain to conf Bain	2	Discharge in upstream catchment, leading to the potential for changes in flow and water quality.
GB205030062426 – Lower Witham – cont Bain to Grand Sluice	f 3	Discharge in upstream catchment, leading to the potential for changes in flow and water quality. A new surface water abstraction will also be located within this catchment.
GB104028053430 – The Fleet Upper Catchment (trib of Trent)	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB205030051515 – Black Sluice IDB draining to the South Forty Foot Drain	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105030056490 – Ousemere Lode	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105030056480 – Billingborough Lode	1	A new transfer will be located within this catchment. No significant impacts anticipated.

Waterbody ID	Maximum impact score / screening outcome	Comment
GB105030051555 – Pointon Lode	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105030051540 – Old Beck	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105031050720 - Glen	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB205031050705 – Vernatt's Drain	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB105031050600 – Welland – conf Greatford Cut	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB205031050595 – Maxey Cut	1	A new intake structure and transfer will be located within this catchment. No significant impacts anticipated.
GB105031050595 – Brook Drain (including Marholm Brook)	1	A new transfer and storage reservoir will be located within this catchment. No significant impacts anticipated.
GB205031050685 – Welland – conf Greatford Cut to tidal	1	A new transfer will be located within this catchment. No significant impacts anticipated.
GB40502G445000 – Cornbrash	1	A new transfer will be located within this groundwater body catchment. No significant impacts anticipated.
GB40402G990300 – Lower Trent Erewast – Secondary Combined	י 1	A new intake structure and transfer will be located within this groundwater body catchment. No significant impacts anticipated.
GB40502G401400 – Witham Lias	1	A new transfer will be located within this groundwater body catchment. No significant impacts anticipated.

Level 1 assessment identified 24 waterbodies which could potentially be affected by the scheme. Following the Level 1 assessment, seven of these waterbodies were identified as requiring further assessment, due to the potential effects on the WFD waterbodies.

The following WFD surface water bodies were assessed at Level 2:

- GB105030056515 Swaton Drains
- GB105030056520 South Beck
- GB104028053110 Trent from Soar to Beck
- GB105030056780 Witham conf Cringle Bk to conf Brant
- GB105030062370 Witham conf Brant to conf Catchwater Drain
- GB205030062425 Witham conf Catchwater Drain to conf Bain
- GB205030062426 Lower Witham conf Bain to Grand Sluice

5.2 Level 2 WFD Assessment

5.2.1 Assessment methodology

The second stage of the WFD assessment has been completed for the SLR scheme for waterbodies that were screened in at Level 1. Further information on WFD classification and the approach adopted can be found in *ACWG*, *WFD*: *Consistent framework for undertaking no deterioration assessments*, *Nov 2020*. This assessment will be updated as design progresses and a full WFD assessment will be completed for consenting.

Table 5.3 provides a summary of WFD confidence levels used to inform the Level 2 assessment.

Confidence Level	Description
Low	Gate one and two - Limited data and evidence available, based mainly or completely on expert judgement with many assumptions. Preliminary design information only, detailed information on location/routes, construction methods etc not yet available.
Medium	Gate two - Some data and evidence available, based partially on expert judgement with some assumptions. Design progressed but some assumptions made on construction methods etc.
High	Gate three and four - Lots of good data and evidence are available, minimal assumptions. Design advanced minimal assumptions needed.

Table 5.3: Explanation of WFD confidence levels, based on ACWG methodology

Table 5.4 provides a description of the risk of deterioration between status classes, compromising waterbody objectives, and assisting future attainment of waterbody objectives. Each WFD supporting element has been assessed against the potential risk as a result of the activity occurring.

Table 5.4: Description of WFD risk levels/outcomes

Deterioration between status classes	Compromises waterbody objectives	Assists attainment of waterbody objectives		
Yes = activities have a clear potential to cause deterioration of WFD status	Yes = activities clearly conflict with delivery of future improvements in WFD status	No = activities unlikely to contribute to achieving 'Good' status or potential		
Possible = activities could cause deterioration of WFD status but unclear extent/level of effect	Possible = activities conflict with future improvements in WFD status but unclear extent/level of effect	Possible = activities could contribute to achieving 'Good' status or potential but unclear extent/level of effect		
No = activities unlikely to pose any risk of deterioration in status	No = activities unlikely to pose any risk of deterioration in status	Yes = activities could directly contribute to achieving 'Good' status or potential		
Uncertain = insufficient information or evidence to assess				

Source: ACWG, 2020.

5.2.2 Standard mitigation and good practice

Construction activities will be managed by good practice construction measures to be included within an CEMP for the scheme in accordance with Construction Industry Research and Information Association (CIRIA) Guidelines. Guidance on good practice in relation to pollution prevention and water management is set out in CIRIA's 'Environmental good practice on site'⁸, CIRIA's 'Control of water pollution from linear construction projects; Technical Guidance'⁹ and the withdrawn EA's 'Protect groundwater and prevent groundwater pollution'¹⁰, Pollution Prevention Guidelines (PPG)5 'Works and maintenance in or near water', PPG6 'Working at Construction and Demolition Sites', PPG7 'The safe operation of refuelling facilities', and PPG13 'Vehicle washing and cleaning'¹¹. Whilst the EA PPGs were formally withdrawn in 2015, the information still provides useful guidance. It is assumed the reservoir will include adequate drainage to accommodate potential changes in surface water run-off and water control.

5.2.3 Summary of results/outcomes

The following WFD surface water bodies were assessed at Level 2:

- GB105030056515 Swaton Drains
- GB105030056520 South Beck
- GB104028053110 Trent from Soar to Beck
- GB105030056780 Witham conf Cringle Bk to conf Brant
- GB105030062370 Witham conf Brant to conf Catchwater Drain
- GB205030062425 Witham conf Catchwater Drain to conf Bain
- GB205030062426 Lower Witham conf Bain to Grand Sluice

The Level 2 WFD assessment for the two waterbodies which the reservoir will be located in: Swaton Drains and South Beck, identified deterioration risks to hydromorphological supporting elements, in addition to geomorphological conditions (not as assessed as part of the WFD). These are primarily due to potential risks associated with the loss of open watercourses, which could potentially be mitigated by the realignment of some watercourses and/or alternative

* Environment Agency (2017) Protect groundwater and precent groundwater pollution (prime) available at. https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protectgroundwater-and-prevent-groundwater-pollution (Last accessed March 2022)

groundwater-and-prevent-groundwater-pollution (Last accessed March 2022). ¹¹ The Environment Agency PPGs were formally withdrawn on 17 December 2015; however, they nonetheless provide clear and useful good practice advice. The archived PPGs are available at: https://webarchive.nationalarchives.gov.uk/20140328090931/http://www.environment-

agency.gov.uk/business/topics/pollution/39083.aspx.

⁸ Audus, Charles and Evans (2010) Environmental Good Practice on Site (Third Edition) (C692).

⁹ Murnane, Heap and Swain (2006) Control of water pollution from linear construction projects; Technical Guidance. ¹⁰ Environment Agency (2017) Protect groundwater and precent groundwater pollution [online] available at:

mitigation (e.g., in-channel improvements). However, further assessment and mitigation design would be required to confirm, and the assessment remains as at risk of deterioration until this work is complete.

The assessment for the remaining five waterbodies identified possible deterioration risks to flow, water quality and biological status elements due to the abstractions and discharges. However, further assessment would be required to confirm the impact and to identify appropriate WFD mitigation.

A summary of the Level 2 WFD assessment is included in Table 5.5. Detailed outputs are presented in Appendix B.

Impacts on downstream waterbodies, including the Wash and Humber estuaries have not been considered at this stage. They will be considered during the next stages of project development.

5.2.3.1 South Beck

The following elements are located within this catchment:

- Construction and operation of a new reservoir
- Construction and operation of new SLR treatment works to supply connection point flow conveyance

A potential minor localised risk (no risk of deterioration) to the South Beck was identified from the loss of open watercourse and loss of up to 4% of open watercourse within the catchment due to the presence of the reservoir. This loss of catchment and watercourses could impact on habitat, flow and hydromorphology within this waterbody catchment.

At this stage, it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.3.2 Swaton Drains

The following elements are located within this catchment:

- Construction and operation of a new reservoir
- Construction and operation of a new pipeline
- Construction and operation of a new Water Treatment Works (WTW), set back from the watercourse
- Construction and operation of a new small storage reservoir (set back from the watercourse)

A potential major adverse risk (risk of deterioration) to the Swaton Drains was identified, as a result of the reservoir footprint. This would result in loss of up to 2.5km of open channel, along with 28% of the catchment. The loss of catchment and open channel would lead to major adverse effects (risk of deterioration) on habitat, flow, hydromorphology and mitigation measures assessment in this waterbody. Mitigation could include realigning and diverting any substantial watercourses. Similarly, river restoration (in-channel and/or floodplain reconnection and riparian improvements/NFM) could also be considered to offset loss of habitat and impacts on hydromorphology. Consideration could be given to providing compensatory flows from the reservoir to Swaton Drains to support flows, though implications on water quality and INNS would need to be considered. However, until further assessment and design has included suitable mitigation a risk of deterioration remains.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to a watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

The new WTW will be set back from the watercourse, therefore the construction impacts are expected to be negligible.

5.2.3.3 Trent from Soar to Beck

The following elements are located within this catchment:

- Construction and operation of a new surface water abstraction
- Construction and operation of a new river intake structure
- Construction and operation of a new pipeline

An amber adverse risk (potential risk of deterioration) to the Trent from Soar to Beck was identified as a result of the new surface water abstraction. Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. An amber adverse risk (potential risk of deterioration) was also identified due to potential for changes in water quality due to the surface water abstraction. The abstraction could result in a change in the physio-chemical conditions due to reduced dilution downstream.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.3.4 Witham – conf Cringle Bk to conf Brant

The following elements are located within this catchment:

- Construction and operation of a new discharge and outfall structure
- Construction and operation of a new inter river flow conveyance, Trent to Witham transfer

A potential major adverse risk (risk of deterioration) to the Witham – conf Cringle Bk to conf Brant was identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the indicative transfer was conducted, it concludes there is an expected 69% increase in ammonia concentrations. The RBMP Cycle 2 status of ammonia is currently 'High'. The expected increase in ammonia concentration has the potential to lead to a major adverse risk (risk of deterioration) on the water quality. There is an expected increase 17% in phosphate concentrations, with a Cycle 2 classification of 'High' and 'Moderate'. This is expected to have an amber adverse risk (potential risk of deterioration). It is recommended additional water quality modelling analysis should be undertaken to assist in determining the appropriate mitigation measures.

An amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecology analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements.

The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river. At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse.

Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

The INNS treatment planned on the abstraction from the River Trent will ensure there is no risk for transfer of INNS into the River Witham from the River Trent.

5.2.3.5 Witham - conf Brant to conf Catchwater Drain

The following elements are located within this catchment:

• Transfer of discharged water from the River Trent abstraction

A potential major adverse risk (risk of deterioration) to the Witham – conf Brant to conf Catchwater Drain was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high- level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Witham - conf Brant to conf Catchwater Drain catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

- Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)
- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in Dissolved Oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

Finally, an amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements. The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river.

5.2.3.6 Witham - conf Catchwater Drain to conf Bain

The following elements are located within this catchment:

• Transfer of discharged water down River Witham from the River Trent abstraction

A potential major adverse risk (risk of deterioration) to the Witham - conf Catchwater Drain to conf Bain was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high-level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Witham - conf Catchwater Drain to conf Bain catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

• Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)

- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in Dissolved Oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

Finally, an amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements. The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river.

5.2.3.7 Lower Witham - conf Bain to Grand Sluice

The following elements are located within this catchment:

- Transfer of discharged water down River Witham from the River Trent abstraction
- Construction and operation of a new surface water abstraction on the River Witham
- Construction and operation of a new river intake structure
- Construction and operation of a new River Witham to SLR flow conveyance pipeline

A potential major adverse risk (risk of deterioration) to the Lower Witham - conf Bain to Grand Sluice was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high-level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Lower Witham - conf Bain to Grand Sluice catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

- Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)
- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in dissolved oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

An amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge and subsequent abstraction at this waterbody will lead to changes in water velocity and level, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge and abstraction on flow velocity and levels, and therefore on biological status elements.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities. Therefore, the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.4 Summary

Table 5.5 provides a summary of all the WFD waterbodies screened in at Level 1 and 2 of the WFD Assessment.

Table 5.5: Summary of WFD waterbodies affected

Waterbody ID	Maximum Impact Score (Level 1)	Maximum Impact Score (Level 2)	Deterioration between status classes	Impediments to GES/GEP	Compromises waterbody objectives	Assists attainment of water body objectives
GB105030056515 - Swaton Drains	3	3	Yes	Yes	Yes	No
GB105030056520 - South Beck	3	1	No	No	No	No
GB104028053110 – Trent from Soar to Beck	3	2	No	No	No	No
GB105030056780 – Witham – conf Cringle Bk to conf Brant	3	3	Yes	Yes	Yes	No
GB105030062370 - Witham conf Brant to conf Catchwater Drain	3	3	Yes	Yes	Yes	No
GB205030062425 – Witham – conf Catchwater Drain to conf Bain	3	3	Yes	Yes	Yes	No
GB205030062426 – Lower Witham – conf Bain to Grand Sluice	3	3	Yes	Yes	Yes	No
GB104028053111 - Slough Dyke Catchment (trib of Trent)	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB104028053430 - The Fleet Upper Catchment (trib of Trent)	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB205030051515 - Black Sluice IDB draining to the South Forty Foot Drain	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105030056490 - Ousemere Lode	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105030056480-Billingborough Lode	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105030051555 - Pointon Lode	1	Level 2 assessment not required	N/A	N/A	N/A	N/A

GB105030051540 -Old BeckGB105030051540Old Beck	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105031050720 - Glen	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB205031050705 - Vernatt's Drain	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105031050600 - Welland - conf Gwash to conf Greatford Cut	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB205031050595 - Maxey Cut	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB105031050595 - Brook Drain (including Marholm Brook)	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB205031050685 - Welland - conf Greatford Cut to tidal	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB40502G445000 - Cornbrash	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB40402G990300 - Lower Trent Erewash - Secondary Combined	1	Level 2 assessment not required	N/A	N/A	N/A	N/A
GB40502G401400 - Witham Lias	1	Level 2 assessment not required	N/A	N/A	N/A	N/A

5.3 Risk of deterioration

A major adverse risk (risk of deterioration) to the Swaton Drains (ID: GB105030056515) has been identified. Within the reservoir footprint over 2.5km of open channel would be lost, along with 28% of the catchment. The loss of open channel would impact on habitat, flow and hydromorphology in this waterbody. Mitigation would include provision of new open water channels and providing compensatory flows from the reservoir to Swaton Drains. However, implications on water quality and INNS would to be considered. Similarly, river restoration (inchannel and/or floodplain reconnection and riparian improvements/NFM) could also be considered to offset loss of habitat and impacts on hydromorphology.

An amber adverse risk (potential risk of deterioration) to the Trent from Soar to Beck was identified as a result of the new surface water abstraction. Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. An amber adverse risk (potential risk of deterioration) was also identified due to potential for changes in water quality due to the surface water abstraction. The abstraction could result in a change in the physico-chemical conditions due to reduced dilution downstream.

A major adverse risk (risk of deterioration) to the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780) has been identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the indicative transfer was conducted, it concludes there is an expected 69% increase in ammonia. As of the RBMP Cycle 2 the status of ammonia is 'High', this increase in ammonia has the potential to cause a significant effect on the water quality. In combination with an increase in the other physico-chemicals, this has the potential to decrease the chemical status from 'Moderate' to 'Poor'. It is recommended additional water quality modelling analysis should be undertaken to assist in determining proportionate mitigation measures.

Major adverse risk (risk of deterioration) to the Witham – conf Brant to conf Catchwater Drain (ID: GB105030062370) and the Witham - conf Catchwater Drain to conf Bain (ID: GB205030062425) have been identified as a result of the discharge from the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780). A high-level water quality assessment concludes an expected 46% increase in phosphate by the time it reaches both catchments. Within the catchments, phosphate levels are expected to be lower. However, further investigation is required to determine the predicted percentage change. It is recommended additional water quality modelling analysis should be undertaken to assist in determining the proportionate mitigation measures.

If this scheme is taken forward, it is possible that an exemption would need to be sought under Regulation 19 of the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 (WFD Regulations 2017) in respect of potential deterioration in status of one or more waterbodies. Further investigation is required to fully quantify the impacts and identify possible mitigation.

5.4 In-combination effects

An initial in-combination effects assessment has been undertaken as part of the gate two WFD report. The SLR SRO is being considered as a major supply-side option in the Water Resources East (WRE) Regional Plan and Anglian Water's draft Water Resources Management Plan 2024 (dWRMP24). If the scheme is selected, it will be subject to further in-combination and incombination effects assessment with the other selected options, neighbouring water company plans and neighbouring regional plans. Until the WRE Best Value Regional Plan has been developed, it is not known when the scheme would be implemented, and therefore which other developments it could act in-combination with.

There is the potential for in-combination impacts on The Wash as a result of the SLR and Fens reservoir schemes. Further work will be undertaken during the next stages of project development to determine the extent of potential in-combination effects on The Wash, following the outcome of the ongoing hydrological assessments. Similarly, there are potential in-combination effects as a result of SLR and Minworth SRO on the River Trent. Further work will be undertaken at during the next stages of project development to identify the potential in-combination effects, based on the ongoing hydrological assessments (assuming Minworth SRO is taken forward to gate three).

For the purpose of this assessment only Local Development Frameworks, Development Consent Orders (DCOs) for Nationally Significant Infrastructure Projects, Hybrid Bills, Relevant Transport and Works Act Orders and relevant planning applications or allocations have been considered.

A search of the committed developments identified 24 within the search radius of 10km. The search concluded no committed developments would be impacted as a result of the SLR scheme, due to their locations not being hydrologically connected.

A search of major planning applications identified 17 within the search radius of relevance to WFD. The search concluded one major planning application had the potential of being impacted by the scheme. The development¹² is to facilitate the Viking Link electrical interconnecter with an approximate capacity of 1400 megawatts (MW) extending from Revising, Jutland (Denmark) to Bicker Fen, Lincolnshire (United Kingdom). Works include installations of up to six onshore high voltage cables, link pillars along the cable rout, drainage mitigation and fibre optic cable. In relation to the SLR scheme, the cables intersect the River Witham between the SLR abstraction and discharge locations. The cables also intersect the transfer route between the River Witham and the A17. The Environmental Impact Assessment for this project states the construction of the cables will involve trenchless activities (i.e. Horizontal Directional Drilling) of the watercourse crossings. The activities associated with this construction method could lead to an increase in turbid run-off and spillages/leaks of fuel, oil or other pollutants; with the potential to impact on the water quality in the receiving the watercourses. Additionally, there could be an increase in soil erosion, along the exposed cable trenches. This has the potential to turbid (sediment laden) runoff affecting the nearby watercourses. Mitigation for The Viking Link Project includes areas of risk of spillage to be bunded or otherwise isolated to minimise the risk of hazardous substances entering the local watercourses, any surface water flowing into the trenches, will be pumped via settling tanks to remove sediment and potential contaminants before being discharged back into the watercourse, as well Environment Agency (EA) standard good practice measures (such as PPGs). Use of this mitigation would lead to minor adverse effects that are not significant. It is anticipated with effective mitigation from both the SLR scheme and the development, this will have a minor localised risk (no risk of deterioration) on the affected watercourses.

In addition, 3 mineral allocations were identified within the same waterbodies as SLR (see Table 5.6). SLR involves the installation of new transfers, with associated below ground structures for crossings in these waterbodies. Each of the mineral extraction sites may require dewatering to allow extraction of sand and gravel. Therefore, for all three of these projects there is the potential for in-combination effects due to impacts on river flows, from reduced baseflow from groundwater. However, the scale of works associated with SLR is likely to be small and temporary. Within suitable mitigation in place (such as the discharge of dewatering into local watercourses), is it anticipated that construction of SLR will not increase the risk of deterioration

¹² National Grid (2017) Viking Link. Available at: <u>viewDocument (sholland.gov.uk)</u>

in the water bodies associated with these mineral allocation projects. Further information is required on each of the mineral allocation projects to confirm this.

Project name	Description	Waterbody impacted
Baston No.2 Quarry Phase 2, Langtoft	Hanson Aggregates Quarry with proposed 2025 extension of existing site for 37 additional hectares of sand and gravel extraction	GB205031050705: Vernatt's Drain
Land off Main Road, Maxey	Potential sand and gravel at site across 33 hectares of land in Maxey	GB205031050595: Maxey Cut
West Deeping Development Brief	36.1 hectare extension to existing King Street Quarry for 2027	GB105031050600: Welland – conf Gwash to conf Greatford Cut

Overall, it is assessed that there will be no in-combination effects due to the SLR project and other committed developments or major planning applications.

5.5 Requirements to improve confidence

The following requirements have been identified in the WFD assessment to improve confidence in the assessment of the surface water bodies:

- On-going refinement of the design in consultation with a WFD specialist.
- Land drainage and site drainage design, to understand which watercourses will be diverted/realigned and which are lost.
- Request for further specific details of mitigation measures assessment and RBMP measures (including HWMB measures where relevant) from the EA to understand the impact of the scheme, and to identify opportunities to improve the water body as part of the scheme.
- Update to WFD baseline data to include 2019 status in line with Cycle 3 2021-2027 RBMPs, once published.
- It is recommended that a hydrology study is undertaken to understand the potential reduction in catchment area, impacts on flow and therefore biological status elements for South Beck and Swaton Drains waterbodies.
- A hydrology study is recommended to understand potential impacts of reduced flow in the Trent from Sour to The Beck catchment on the hydrological regime and water quality (including both continuous and spot sample water quality monitoring).
- It is recommended additional water quality monitoring (both continuous and spot monitoring) is carried out on the four Witham waterbodies. This data should then be used in further water quality analysis to determine the effects of the discharge from the River Trent on water quality and therefore biology.
- It is recommended hydraulic modelling analysis is undertaken to determine the effects of the increase in flow volume and velocity on the four Witham waterbodies as a result of the discharge.
- Development of WFD mitigation to offset impacts of the scheme.
- Completion of full WFD assessment for consenting stage.

5.6 Mitigation measures

Potential mitigation measures have been suggested for each individual waterbody and scheme activity based on the risk that it poses. The potential mitigation measures should be considered further as design progresses.

Potential mitigation measures for the surface water bodies are set out below:

- Watercourses should be realigned around the reservoir footprint, where reasonably practicable, to re-provide lost habitat and flow into the main rivers.
- Channel modifications should seek to offer the change to incorporate environmental gain by widening drains to allow fringe vegetation to be retained or berms to be constructed, subjection to financial burdens during construction, land take and maintenance.¹³
- Considerations to avoid deterioration to hydromorphological determinants including how the flow and quantity of water changes over time.
- Intake structures should be fitted with appropriate fish / eel screens.
- INNS treatment for the transfer from the River Trent to the River Witham.
- If required, consideration of potential water quality treatment of water from River Trent before discharge to River Witham, if additional investigation into nutrient loads indicates a risk of WFD deterioration in water quality.
- Potential low flow releases from the reservoir into local watercourses to help maintain flow (if further investigation suggest this is needed).
- Industry good practice measures including PPG's.¹⁴
- Ensure all works carried out in accordance with guidance provided by the regulator, the EA, for working on/or near water.¹⁵
- Consideration of mitigation options in line with guidance provided in 'A Guide to Management Strategies and Mitigation Measures for Achieving Good Ecological Potential in Fenland Waterbodies'.¹⁶

A geomorphological walkover should be undertaken at future project stages to understand the status of each watercourse and identify potential suitable mitigation.

This environmental appraisal has highlighted that some uncertainties and risks remain that will need resolving. For WFD, a detailed strategy to develop a robust evidence base to inform subsequent assessments, and potentially derogation tests, will need to be developed in consultation with the regulators.

¹³ https://www.wlma.org.uk/uploads/Guide_GEP_Fenland_Water_Bodies_web.pdf

¹⁴ Although PPG's are considered to be out of date, they remain good practices for the industry and should be used as embedded mitigation when applicable.

¹⁵ Environment Agency, Protecting and improving the water environment. Water Framework Directive compliance of physical works on or near rivers

¹⁶ Mayer, L., Moodie, I., Carson, C., Vines, K., Nunns, M., Hall, K., Redding, M., Sharman, P. & Bonney, S. (2017) Good Ecological Potential in Fenland Waterbodies: A Guide to Management Strategies and Mitigation Measures for achieving Good Ecological Potential in Fenland Waterbodies. Association of Drainage Authorities & Environment Agency

6 Conclusions

6.1 Conclusion

For the assessment of the SLR scheme, a WFD assessment has been developed to assess the potential for WFD risks as a result of the scheme. The Level 1 assessment indicated that 24 surface waterbodies, with seven of them requiring further assessment.

Level 2 WFD assessments were completed for seven waterbodies and the findings indicate that there are precautionary WFD compliance risks associated with all seven of these waterbodies are set out in Table 6.1 below.

Waterbody name	Waterbody ID	Maximum impact score (Level 2)	Potential impact score post mitigation (Level 2)
Swaton Drains	GB105030056515	3 (major adverse)	3 (major adverse)
South Beck	GB105030056520	2 (amber adverse)	2 (amber adverse)
Trent from Soar to Beck	GB104028053110	2 (amber adverse)	2 (amber adverse)
Witham – conf Cringle Bk to conf Brant	GB105030056780	3 (major adverse)	3 (major adverse)
Witham conf Brant to conf Catchwater Drain	GB105030062370	2 (amber adverse)	3 (major adverse)
Witham – conf Catchwater Drain to conf Bain	GB205030062425	2 (amber adverse)	3 (major adverse)
Lower Witham – conf Bain to Grand Sluice	GB205030062426	3 (major adverse)	3 (major adverse)

Table 6.1: Summary of Level 2 WFD assessment results

The risks identified with the surface water bodies are due to the loss of catchment area and open watercourses, particularly associated with larger channel and decrease in the water quality. Mitigation could include realignment/diversion of the watercourses around the reservoir, but further assessment and design is needed to finalise mitigation needs.

It is possible that an exemption would need to be sought under Regulation 19 of the Water Environment (WFD) (England & Wales) Regulations 2017 (WFD Regulations 2017) in respect of potential deterioration in status of one or more waterbodies. Further investigation will be required to fully quantify the impact, identify possible mitigation and determine the need for any potential exemption.

6.2 Recommendations

Area for future focus include:

- Consultation with the EA to present and discuss key WFD risks and proposed approach to improving certainty of assessment.
- Collation and review of Heavily Modified Waterbody (HMWB) and mitigation measures information from the EA to understand impact of the scheme and also to identify opportunities to improve the water body as part of the scheme.
- Update to WFD baseline data to include 2019 status in line with Cycle 3 2021-2027 RBMPs, once published.

- Land drainage and site drainage design to understand which watercourses will be diverted/realigned and which are lost.
- A hydrology study to understand potential impacts of reduced flow in the Trent from Sour to The Beck catchment on the hydrological regime and water quality (including both continuous and spot sample water quality monitoring).
- Additional water quality monitoring (both continuous and spot monitoring) is carried out on the four Witham waterbodies. This data should then be used in further water quality analysis to determine the effects of the discharge from the River Trent on water quality and therefore biology.
- It is recommended additional water quality modelling analysis should be undertaken to assist in determining the appropriate mitigation measures.
- It is recommended hydraulic modelling analysis is undertaken to determine the effects of the increase in flow volume and velocity on the four Witham waterbodies as a result of the discharge.
- Development of WFD mitigation to offset impacts of the scheme.
- Identify further work or modelling required to demonstrate compliance into during the next stages of project development.
- Completion of full WFD assessment for consenting stage.

A. Level 1 WFD assessment

Impacted Waterbody ID	Impacted Waterbody Name	Waterbody type	Overall waterbody Classification	Overall waterbody Objective	Number of activities assessed	Count of activities scoring major benefit score	Count of activities scoring minor benefit score	Count of activities scoring minimal impact score	Count of activities scoring minor local impact score	Count of activities scoring medium impact score	Count of activities scoring high impact score	Level 1 max score	Level 1 mean score	Carry through to level 2 assessment?
GB105030056520	South Beck	River	Poor in 2015	Moderate by 2027	13	0	0	2	8	1	2	3	1.23	YES
GB105030056515	Swaton Drains	River	Moderate in 201	5 Good by 2027	12	0	0	2	7	1	2	3	1.25	YES
GB104028053110	Trent from Soar to The Beck	River	Moderate in 201	5 Moderate by 2015	9	0	0	1	6	1	1	3	1.22	YES
GB105030056780	Witham - conf Cringle Bk to conf Brant	River	Moderate in 201	5 Moderate by 2015	9	0	0	2	6	0	1	3	1.00	YES
GB104028053111	Slough Dyke Catchment (trib of Trent)	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB104028053430	The Fleet Upper Catchment (trib of Trent)	River	Bad in 2015	Poor by 2027	5	0	0	1	4	0	0	1	0.80	NO
GB205030051515	Black Sluice IDB draining to the South Forty Foot Drain	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB105030056490	Ousemere Lode	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB105030056480	Billingborough Lode	River	Moderate in 201	5 Good by 2027	5	0	0	1	4	0	0	1	0.80	NO
GB105030051555	Pointon Lode	River	Moderate in 201	5 Good by 2027	5	0	0	1	4	0	0	1	0.80	NO
GB105030051540	Old Beck	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB105031050720	Glen	River	Moderate in 201	5 Good by 2027	5	0	0	1	4	0	0	1	0.80	NO
GB205031050705	Vernatt's Drain	River	Moderate in 201	5 Good by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB105031050600	Welland - conf Gwash to conf Greatford Cut	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB205031050595	Maxey Cut	River	Moderate in 201	5 Moderate by 2015	6	0	0	1	5	0	0	1	0.83	NO
GB105031050595	Brook Drain (including Marholm Brook)	River	Moderate in 201	5 Moderate by 2015	6	0	0	2	4	0	0	1	0.67	NO
GB205031050685	Welland - conf Greatford Cut to tidal	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	4	0	0	1	0.80	NO
GB40502G445000	Cornbrash	GroundWate	er Poor in 2015	Poor in 2015	2	0	0	0	2	0	0	1	1.00	NO
GB40402G990300	Lower Trent Erewash - Secondary Combined	GroundWate	er Poor in 2015	Good by 2027	3	0	0	0	3	0	0	1	1.00	NO
GB40502G401400	Witham Lias U	GroundWate	er Good by 2015	Good by 2027	3	0	0	0	3	0	0	1	1.00	NO
GB105030062370	Witham - conf Brant to conf Catchwater Drain	River	Moderate in 201	5 Moderate by 2015	1	0	0	0	0	0	1	3	3.00	YES
GB205030062425	Witham - conf Catchwater Drain to conf Bain	River	Moderate in 201	5 Moderate by 2015	1	0	0	0	0	0	1	3	3.00	YES
GB205030062426	Lower Witham – conf Bain to Grand Sluice	River	Moderate in 201	5 Moderate by 2015	5	0	0	1	2	0	2	3	1.60	YES

							Trent from Soar	Witham - conf Cringle Bk to	Slough Dyke Catchment (trib	The Fleet Upper Catchment (trib	Black Sluice IDB draining to the South Forty Foot		Billingborough				V	Velland - conf wash to conf		Brook Drain (including	Welland - conf Greatford Cut to	0 mm h mm h	Lower Trent Erewash - Secondary		Witham - conf Brant to conf Catchwater	Witham 1st and 3rd IDBs draining to the River	3
Component	Activity	Construction, Operation or Decommissioning	Assumptions / Mitigations assumed to be in place	Comments	Score GB10503005	Swaton Drain	15 GB104028053110	GB105030056780	of Irent)	of Irent)	GB205030051515	Jusemere Lode	GB105030056480	Pointon Lode	GB105030051540	Slen	GB205031050705	B105031050600	Maxey Cut GB205031050595	GB105031050595	tidal GB205031050685	GB40502G445000	GB40402G990300	GB40502G401400	GB105030062370	GB205030062425	GB205030062421
Below ground	Construction/repair of new tunnels and conduits	Construction	Tunnels and conduits will be constructed such that they will not form a preferential pathway for the flow of monochrometers	The specific below ground activities should affect the groundwater only and not surface water	1 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A
Below ground	Construction of below ground structures (shaft/retaining wall) with associated dewatering, with no sensitive groundwater feature within 500m	Construction	Risk assessments will be undertaken for excavation wor and dewatering to ensure no adverse impact on watercourses, wetland habitats or abstractions.	surface waters Ks The specific below ground activities should affect the aroundwater only and not surface water	1 1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Below ground	Presence of new underground structure (tunnel/shaft/retaining wall), with no.	Operation	Dewatering discharge will be treated before discharge. Land drainage will be provided on the upgradient side of the scheme such that they will not cause an increase in groundwater flooding risk. This drainage will be discharge	The specific below ground activities should affect the ad groundwater only and not surface water	1 N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Below ground	Construction of below ground structures (shalt/retaining wall) with associated dewatering, within 500m of a sensitive groundwater feature	Construction	into local watercourses to maintain flow. Risk assessments will be undertaken for excavation wor and dewatering to ensure no adverse impact on watercourses, wetland habitats or abstractions. If impact	ks The specific below ground activities should affect the aroundwater only and not surface water	2 N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Below ground	Presence of new underground structure (tunnel/shaft/retaining wall) within 500m	Operation	likely appropriate mitigation to be put in place Dewatering discharge will be treated before discharge. Land drainage will be provided on the upgradient side of the scheme such that they will not cause an increase in	The specific below ground activities should affect the	2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-	Construction of new cutting with external dewatering with no sensitive		groundwater flooding risk. This drainage will be discharge into local watercourses to maintain flow.	The specific below around activities should affect the																							4
Below ground Below ground	Construction of new cutting/below ground excavation with external dewatering within 500m of a sensitive groundwater feature	Construction	N/A Risk assessments will be undertaken for excavation wor and dewatering to ensure no adverse impact on watercourses, welland habitats or abstractions. If impact likely appropriate miteriation to be any in place	The specific below ground activities should affect the groundwater only and not surface water.	1 N/A	N/A 2	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Below ground	Construction of new cultert	Construction	Deviceing discharge wire be treated before discharge. Appropriate procession will be taken when working of the channels of a diplacet to watercourse, provide a few appropriate procession of the taken of the potential for deposition of all or release of other forms of supendial material or political within the water of the potential for the inline with the requerements set out within the Environment Approxy. PPGR (PPGS: Violas and maintenance contention of Pfullace, PPGS: Violas and maintenance of the period of the period of the period of the period period of the period of the period of the period of the period period of the period of the period of the period of the period period of the period of the period of the period of the period period of the period of the period of the period of the period of the period period of the period	e The specific below ground activities should affect the groundwater only and not surface water in	1 N/A	N/A	NA	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	N/A	N/A	N/A	N/A
Catchment management	Knowledge exchange or education programme	Operation	N/A The impact of the scheme will be felt in the long term. The	N/A se	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catchment management	Changes to land management practices to reduce pesticides, nutrients, sediment or flooding relating to a groundwater source	Operation	scheme will be focused around the SPZ1 and 2 areas of the groundwater source of interest. These schemes are smaller scale than surface water. An immediate change may be seen in the water quality	NA	-1 N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catchment management	Changes to land management practices to reduce pesticides, nutrients, sediment or flooding relating to a surface water source	Operation	downstream of the changes to land management. It is assumed there is a high level of engagement from those relevant for reducing the parameter of interest. There may be minor short term impacts during the	N/A	-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catalana inanagement			construction phase River restorations will be selected in line with WINEP		NVA	10/5	NVA																				
Catchment management	Kiver restoration - after construction	Operation	criteria. The restorations are to improve hydrological flow in the local area		-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A
Catchment management	Terrestrial habitat creation/management - creation	Construction	N/A	N/A	1 N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Catchment management	Terrestrial habitat creation/management - management Natural water retention measures (including NFM and wetland creation) -	Operation	N/A	N/A	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A	N/A N/A	N/A N/A	N/A	N/A N/A	N/A N/A	N/A N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A	N/A	N/A	N/A
Catchment management	construction Natural water retention measures (including NFM and wetland creation)	Operation	N/A	N/A	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catchment management	Fisheries management	Operation	Assumed to be in place due to WINEP driver or similar criteria to improve ecological status of the river.	N/A	-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catchment management		Construction	N/A	SuDS should be employed to manage flooding during construction phase. SuDS may also be required to control	x 1 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A
Catchment management	Sustainable Urban Drainage Systems (SUDS) - construction Sustainable Urban Drainage Systems (SUDS) - after construction	Operation	Assumed to presented as an option at local scale.	and treat surface water runoff during constrution N/A	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catchment management	Integrated catchment management	Operation	This assumes a short term benefit to WFD as imposed usage reduction should allow for recovery in the river or aquiler which may improve WFD status from pre restricti erative	on N/A	-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Culvert	Construction of new inverted siphon or drop intel cullent	Construction	Appopriate precations will be taken when working in the channels of or adjacent to watercourse, providing new culvents and or extending culvents, if required, to appropriately manage flood risk and the potential for deposition of all or release of other forms of supended material or polition within the water column. All measure will be in line with the requirements set out within the Environment Approv/1 PPGE (PPGS): Works and maintenance	e es NA	1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	NA
-			water) Appropriate improvements to local babitat to offset the	8																							4
Culvert	Presence of new culvert, in headwaters or on drainage ditches Presence of new culvert, mid or inwer catchment	Operation	presence of the culvert	N/A N/A	1 N/A	N/A	N/A	N/A	N/A N/A	N/A	N/A N/A	N/A	N/A N/A	N/A	N/A N/A	N/A N/A	N/A	N/A N/A	N/A	N/A	N/A N/A	N/A N/A	N/A N/A	N/A	N/A N/A	N/A	N/A
Culvert	Presence of new cover mid or lower carcillerit	Operation	No assumed mitigations	N/A	3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Culvert Culvert	Removal of existing culverts or other in channel watercourse structure	Decommissioning Decommissioning	No assumed mitigations No assumed mitigations	N/A N/A	-2 N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Discharge	High volume discharge of water with a quality element of higher WFD status that the receiving water body	an Operation	No assumed mitigations	N/A	-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	High volume discharge of water with a quality element of a lower WFD status than the receiving water body	Operation	No assumed mitigations	N/A	3 N/A	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	3	3
Discharge	Low volume discharge of water with a quality element of the same or higher WFD status than the receiving water body	Operation	No assumed mitigations	N/A	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	Low volume discharge of water with a quality element of a lower WFD status than the receiving water body	Operation	No assumed mitigations	N/A	2 N/A	N/A	N/A	N/A	N/A	N/A	N∕A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	Low volume discharge of water with a quality element of the same WFD status as the receiving water body	Operation	No assumed mitigations	N/A	0 N/A	N/A	N/A	N/A	N/A	N/A	N∕A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	High volume discharge of water with a quality element of the same WFD status as the receiving water body	Operation	No assumed mitigations	Discharges from the abstraction and discharge catchments are at Moderate chemical status	1 1	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	New WTW discharge to watercourse	Operation	No assumed mitigations	N/A The discharged water will be transfer through 3	1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	New discharge of highly saline water to a coastal or transitional waterbody	v Operation	No assumed mitigations	catchments before being abstracted N/A	2 N/A	N/A N/A	2 N/A	N/A N/A	N/A	N/A N/A	N/A	N/A	N/A N/A	N/A N/A	N/A	N/A N/A	N/A	N/A N/A	N/A	N/A	N/A N/A	N/A N/A	N/A N/A	N/A	N/A N/A	N/A N/A	N/A N/A
Discharge	New discharge of highly saline water to a surface waterbody or	Operation	No assumed mitigations	N/A	3 N/A	N/A	N/A	N/A	N∕A	N/A	N∕A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Discharge	Construction of a new outfail structure to a watercourse, coastal waters, transitional waters or reservoir	Construction	papagitate precursors with or taken when working in its channels of watercourses, to appropriately manage flood lisk and the potential for deposition of all or release of other forms of suspended material or pollution within the water column. All measures will be in line with the inequirements and out within the Environment Agency's PPGS. Works and maintenances in or new water!	Outfall structures will be constructed for the discharges	1 1	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A
-monarge	int or extenting uncertainge to a watercourse		Appropriate precautions will be taken when working in th	e	- N/A	N/A	IN/A	Tex	IVA	NWA.	IVA	NYA.	IWA	N/A	IVA .	an	.wn	NA.	DVA	TeA	DVA	TRA.	IVA	DVA	TUA.	1970	IVA
Discharge	Maintenance and use of river, coastal or transitional water outfall	Operation	risk and the potential for deposition of sits in to release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution	Assumes there will be maintanence needed	0 0	N/A	N/A	0	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N⁄A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Groundwater	Construction of a new abstraction borehole headworks and associated	Construction	PPG5: Works and maintenance in or near water). No assumed mitigations	N/A	0 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Groundwater	Intrastructure Refurbishment of existing boreholes	Construction	Work will be carried out under appropriate consent from	N/A	0 N/A	N/A	N/A	N/A	N/A	N/A	N/A.	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Groundwater	Drilling new abstraction boreholes	Construction	the EA Work will be carried out under appropriate consent from	N/A	0 N/A	N/A	N/A	N/A	NA	N/A	N/A.	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A
Groundwater	Maintenance and use of abstraction borehole infrastructure	Operation	Ine EA No assumed mitigations	N/A	0 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Habitat	Creation of significant areas of riparian habitats	Construction	Appropriate precautions will be taken when working in th channels of or adjacent to watercourses, to appropriately manage flood risk and the potential for deposition of silt release of other forms of suspended material or pollution within the water column. All measures will be in line with the remulaments set out within the Fundament Aneoco-	e r xr NVA	-2 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Habitat	Minor habitat creation	Construction	PPGs (PPG1: General Guide to Prevention Pollution; PPGS: Works and maintenance in or near water). Appropriate precautions will be taken when working in th channels of or adjacent to watercourses, to appropriately manage food risks and the potential for deposition of sill; release of other forms of suspended material or pollution	e r x' NA	-1 N/A	N/A	N/A	N/A	NA	N/A	N/A.	N/A	N/A	N/A.	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A
			wmm the water column. All measures will be in line with the requirements set out within the Environment Agency PPGs (PPG1: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water). Appropriate precautions will be taken when working in th channels of or adjacent to watercourses, to appropriately manage flood right and the notential for advances in a drift	s e r																							
Habitat	Daylighting of existing culverts	Construction	release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency PPGs (PPG1: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water) Appropriate precautions will be taken when working in th	s N/A	-1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A
Habitat	Channel realignment with natural bed substrate and good riparian connections	Operation	unarries or watercourses, to appropriately manage flood risk and the potential for deposition of sit or release of other forms of suspended material or pollution within the water column. All measures will be in line with the tequirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water).	NA	-1 N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	N/A	N/A	N/A	N/A
Habitat	Channel realignment with antificial banks/base	Operation	Appropriate pre-calitors will be taken when working in the channels of watercourses, to appropriately marage fload risk and the potential for deposition of all or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements end out within the Environment Approx/s PPGS (PPG1: General Guide to Prevention of Pollution: PPGS) (PPG3: and maintenance) in or pervision	e NA	1 1	1	N/A	N/A	N∕A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A	N∕A	N/A	N/A	N/A	N/A

				1										-														
Intake	Construction or modification of a new pumping station and/or intake from raw water (river or coastal waters)	Construction	Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood fisk and the potential for deposition of sill or release of other forms of ouspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water).	New inlet structure will impact existing water body.	1	N/A	N/A	1	N/A	NA	N/A	NA	N/A	N/A	N⁄A	N/A	N/A	N/A	N/A	1	N⁄A	N/A	N⁄A	1	N/A	N/A	N⁄A	N/A
Intake	Maintenance and use of river intakes	Operation	Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of sill or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPGS, Works and maintenance in or near water).	Maintenance of new intet structures	1	N/A	N/A	1	N/A	NA	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A										
Intake	Maintenance and use of coastal intakes	Operation	Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of sill or release of other forms of suspended material or pollution within the water column. All measures will be in line with the lequirements set out within the Environment Agency's PPGS (PPG1: General Guide to Prevention of Pollution; PPGS works and maintenance in or near water)	NA	1	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	N⁄A	N/A	N/A	NA	N/A	N/A	N⁄A	N/A							
Licence	Use of existing ground and surface water abstraction licences, within licence conditions and recent abstraction patterns	Operation	No assumed mitigations	N/A	0	N/A																						
Licence	Use of existing surface water and groundwater abstraction licences, within existing licence conditions but outside of the recent actual rates	Operation	No assumed mitigations	N/A	2	N/A																						
Licence	Emergency or drought use of existing surface water or groundwater abstraction outside of licence conditions	Operation	No assumed mitigations	N/A	2	N/A																						
Licence	New or increased surface water abstraction New or increased groundwater abstraction	Operation Operation	No assumed mitigations No assumed mitigations	New abstraction within these catchments N/A	3	N/A N/A	N/A N/A	N/A	N/A N/A	N/A 3																		
Licence Licence	New coastal or transitional waterbody abstraction licence Reduction of coastal or transitional waterbody abstraction licence	Operation Operation	No assumed mitigations No assumed mitigations	N/A N/A	-1	N/A N/A																						
Licence	Increase of coastal or transitional waterbody abstraction licence	Operation	No assumed mitigations	N/A Dracume tranching and laving will be used for most	2	N/A																						
Pipelines	Trenching and laying of pipe lines within the interfluves of a catchment (no watercourse crossings)	Construction	constructed such that they do not form preferential	lengths of pipe. Sites should look to capture runoff from pipe and tract hofers discharge	0	N/A																						
Pipelines	Trenching and laying of pipe lines involving watercourse crossings	Construction	pathways for plaunkhader flow, for pipelines will be constructed actual that they are not form preferential pathways for graunkhader flow. Assumed that watercourse crossings will be cartied out using directional drilling or if the watercourse needs to be temporarily divertid, appropriate measures will be in place to protect accopy and watercourse will be returned back to its natural state.	sites and treat before discharge. Trenchiess activities used in locations for rivers, watercourses and watercourse links. Smaller land drains crossed using trenching and laying.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	N/A	NA	N/A	N/A	N/A	1
Pipelines	Trenching and laying of pipe lines involving large watercourse crossings with in	Construction	Flood risk assessment will be carried out to ensure that new in channel features will not adversely impact on flood	Only trenchless activities are designed when there is a water crossing	2	N/A																						
Pipelines	Maintenance of pipe lines	Operation	risk No assumed mitigations	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	0
Pipelines	Draining of pipelines for maintenance	Operation	If water is drained to local watercourse, this will be short term and temporary impacts only	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	1
Pipelines	removal / decommissioning of existing pipeline (no watercourse crossings)	Decommissioning	No assumed mitigations Appropriate precautions will be taken when working in the	Suneys not yet completed, so have presumed construction work to remove exisiting infrastructure is possible. Included for worst-case scenario.	0	N/A	N/A	N/A	N/A	NA	N/A																	
Pipelines	removal / decommissioning of existing pipeline (involving watercourse crossings)	Decommissioning	chaines of watercourses, to appropriately manage hold risk and the potential for deposition of situ or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution;	Surveys not yet completed, so have presumed construction work to remove exisiting infrastructure is possible. Included for worst-case scenario.	0	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A															
Pipelines	New above ground pipelines (crossing watercourse)	Construction	PPG5: Works and maintenance in or near water). N/A	N/A	2	N/A																						
Pipelines	New above ground pipelines (not crossing watercourse) Temporary pipelines to support network upgrades or changes	Operation	N/A N/A	N/A N/A	0	N/A N/A																						
reservoir	Construction of reservoir (set back from watercourse)	Construction	No assumed mitigations	N/A	0	N/A																						
reservoir	Construction of new storage reservoir (in line/next to watercourse - within 500m)	Construction	channels of watercourses, to appropriately manage flood channels of watercourses, to appropriately manage flood risk and the potential for deposition of sill or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution;	Construction of new reservoir within the catchment	3	3	3	N/A																				
reservoir	Modification of an existing storage resencir	Construction	Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of sill or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPols (PPC): General Guide to Prevention of Pollution;	NA	3	N/A	N/A	NA	N⁄A	NA	N/A	NA	N/A	N/A	N⁄A	N/A	N∕A	N/A	N∕A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N⁄A
reservoir	Presence of new or modified existing storage resenoir	Operation	Appropriate preclautions will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of all or release of other forms of suspender dimetrical or pollution within the water column. All measures will be in line with the inguirements and out within the Enforcement Approx/s IPPOR (IPPG): Centeral Guide to Prevention of Pollution; IPPOR (IPPG): Centeral Guide to Prevention of Pollution;	NA	3	3	3	NA	N/A	NA	N/A	NA	N/A	N/A	N⁄A	N⁄A	N∕A	N/A	N∕A	N/A	N/A	N/A	N⁄A	NA	N/A	N/A	N/A	N/A
reservoir	Modification of an existing service reservoir adjacent in close proximity to watercourse	Construction	Appropriate precatations will be taken when working close to channels of watercourses, to appropriately manage flood risk and the potential for discharge of chlorinated water rinto the watercourse. All measures will be in index with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution- PG5: Works and maintenance in or near	NA	1	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A										
reservoir	Presence of new reservoir or modified existing service reservoir in close proximity to watercourse	Operation	Appropriate precautions will be taken when working close to channels of watercourses, to appropriately immage food risk and the potential for discharge of chlorinated water into the watercourse. All measures will be in line with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution.PPG5; Works and maintenance in or near	N/A	1	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A	NA	N/A	N/A	N/A	N/A										
reservoir	Presence of new reservoir or modified existing service reservoir not in close	Operation	No assumed mitigations	N/A	0	N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	N/A N/A	N/A	N/A	N/A N/A	N/A N/A	N/A							
reservoir	Floating or constructed shade for the reservoir to reduce evaporation	Operation	N/A	N/A	2	N/A																						
reservoir	Floating or constructed shade for the reservoir to reduce evaporation New or continuation of contractual agreement between companies to	Construction	N/A	N/A	1	N/A																						
ransrer agreement	continue providing transfer with no change to abstraction licence	Operation	IV/A	NVA.	0	N/A	NA	N/A																				
Transfer agreement	with decrease in abstraction licence associated	Operation	N/A	N/A	-1	N/A																						
Transfer agreement	Contractual agreement between companies to continue providing transfer with increase in abstraction licence associated	Operation	N/A	N/A	2	N/A																						
Usage channes and			This assumes a short term benefit to WFD as imposed usage reduction should allow for recommunity the st																									
abstraction management	Impose water usage restriction under emergency drought orders to business and/or household	Operation	aquifer which may improve WFD status from pre restriction	N/A	-1	N/A																						
Usage changes and	Communication with business or households to reduce water use in times of	Operation	N/A	N/A	0	N/A																						
abstraction management	arougn		For treated water transfer, there is likely to be no WFD																									
Usage changes and abstraction management	Reduce transfer of water between water companies	Operation	impact. For raw water transfer this may have a short term impact changing local habitast at either end of the transfe should the raw water be transferred from river to river. Any changes to transfers are assumed to be in place in the short term.	r N/A	1	N/A	N/A	N/A	N/A	NA	N/A	NA	N/A															
Usage changes and	sources in times of drought and using more resilient sources more frequently.	Operation	This assumes a single abstraction management event is a	a N/A	1	N/A																						
abstraction management Usage changes and abstraction management	This could include switching from GW to surface water or reservoir sources. This could include resting some sources to all for recovery of supply.	Operation	regularly to allow for recovery. This assumes water being tankered is treated and will be input into the network at either treatment works or into a	N/A	0	N/A	N/A	N/A	N/A	NA	N/A	NA	NA	N/A	NA	N/A	N/A	N/A	NA	NA	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A
Usage changes and	rankeinig ifeated water between wikz	Operation	main. This should not have any WFD impact. Assumes use of water would not be for drinking unless	N/A		N/A																						
abstraction management WTW	Tankening raw water or treated effluent Modification of an existing WTW or pumping station relating to treated water	Construction	sent to WTW for full treatment. No assumed mitigations	N/A	0	N/A	0	N/A																				
WTW	Construction of a new WTW or pumping station relating to treated water	Construction	No assumed mitigations	Construction of a new WTW set back from the watercourse	0	N/A																						
WTW	Construction of a new WTW or pumping station relating to raw water	Construction	No assumed mitigations	It is assumed maintenance will be required for the new	1	N/A	1	N/A																				
WTW	Maintenance and use of pumping stations and WTW	Operation	No assumed mitigations	N/A	0	N/A	0	N/A																				
WTW	Removal of existing WTW and associated discharge	Decommissioning	repropriate precations will be taken when working in the channels of watercourses, to appropriately manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGG (PPG1: General Guide to Prevention of Pollution; PPGG (PPG1: General Guide to Prevention of Pollution;	NA	- A	N/A	N/A	NA	N/A	NA	N/A	NA	N/A	N/A	N⁄A	N⁄A	₩A	N/A	₩A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A	N/A
WTW	Small desalination temporary unit	Operation	Assumes no construction is required below ground. Unit	N/A	0	N/A																						
WTW	Construction or modification of a desalination plant	Construction	No assumed mitigations	N/A	1	N/A																						
NATEN/	Maintenance and use of desalination plant	Operation	No sesumed mitigations	N/A	0	NI/A	N/A	NI/A	N/A	N/A	NI/A	N/A	NI/A	N/A	NI/A	N/A	N/A	NI/A	N/A	NI/A	N/A	N/A	N/A	N/A	NI/A	N/A	N/A	N/A

Each activity has been predefined an impact score. The maximum impact score for each waterbody determines if the waterbody requires further assessment or not. Any waterbodies containing activities that score a 2 or a will require a level assessment where mitigation must be demonstrated and POM, RNAGs and the data will be considered.

Level 1 assessment	Impact	Impact Score	Description
	Very beneficial	-2	Impacts that, taken on their own, have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody
	Beneficial	-1	Impacts that, when taken on their own, have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements
Waterbody passes Level 1 WFD assessment	No/minimal	0	No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved.
	Low	1	Impacts that, when taken on their own, have the potential to lead to a minor localised, short-term and fully reversible effects on one or more of the quality elements but would not result in the lowering of WFD status. Impacts would be very unlikely to prevent any target WFD objectives from

Waterbody requires level 2 WFD assessment	Medium	2	Impacts that, when taken on their own, have the potential to lead to a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status. Impacts have the potential to orecent target WFD objectives from being achieved.
	High	3	Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status. Potential for high impact on preventing target WFD objectives from being achieved.

B. Level 2 WFD assessments

Strategic Resource Option WFD assessment for: SLR 41

Waterbody ID	Waterbody name	Waterbody type	Maximum Impact score level 1	Maximum Impact score level 2	Maximum post mitigation impact score level 2	Deterioration between status classes	Impediments to GES/GEP	Compromises water body objectives	Assists attainment of water body objectives
GB105030056520	South Beck	River	3	1	1	No	No	No	No
GB105030056515	Swaton Drains	River	3	3	3	Yes	Yes	Yes	No
GB104028053110	Trent from Soar to The Beck	River	3	2	2	No	No	No	no
GB104028053111	Slough Dyke Catchment (trib of Trent)	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB104028053430	The Fleet Upper Catchment (trib of Trent)	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB205030051515	Black Sluice IDB draining to the South Forty Fo	oo River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105030056490	Ousemere Lode	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105030056480	Billingborough Lode	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105030051555	Pointon Lode	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105030051540	Old Beck	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105031050720	Glen	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB205031050705	Vernatt's Drain	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105031050600	Welland - conf Gwash to conf Greatford Cut	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB205031050595	Maxey Cut	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB105031050595	Brook Drain (including Marholm Brook)	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB205031050685	Welland - conf Greatford Cut to tidal	River	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required
GB40502G445000	Cornbrash	GroundWaterBody	1	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required	Level 2 assessment not required

				Lough 2 accordment	Lough 2 accordment	Level 2	Level 2	Level 2	
			1	Level 2 dssessifient	Level 2 dssessifient	assessment not	assessment not	assessment not	Level 2 assessment
GB40402G990300	Lower Trent Erewash - Secondary Combined	GroundWaterBody		not required	not required	required	required	required	not required
				Loval 2 accossment	Lovel 2 assessment	Level 2	Level 2	Level 2	
			1	Level 2 assessment	Level 2 assessment	assessment not	assessment not	assessment not	Level 2 assessment
GB40502G401400	Witham Lias U	GroundWaterBody		notrequired	notrequired	required	required	required	not required
GB105030056780	Witham - conf Cringle Bk to conf Brant	River	3	3	3	Yes	Yes	Yes	No
GB105030062370	Witham - conf Brant to conf Catchwater Drain	River	3	3	3	Yes	Yes	Yes	No
GB205030062425	Witham - conf Catchwater Drain to conf Bain	River	3	3	3	Yes	Yes	Yes	No
GB205030062426	Lower Witham - conf Bain to Grand Sluice	River	3	3	3	Yes	Yes	Yes	No

Workbook name	SLR 41 - Level 2 WFD assessment Combined.xlsm										
Waterbody ID	Level 2 sheet Waterbody Name created?	Maximum Level 2 Impact score		Confidence in option design			Post mitigation impact score	Deterioration between status classes	Impediments to Good Ecological Status (GES) or Good Ecological Potential (GEP)	Compromises water body objectives	Assists attainment of water Further comments body objectives
GB105030054520	TRUE South Beck	1	Low	Low	 On-painting refinement of the dissign. Cland draimage and Sile draimage design to understand which watercourses will be diverted/refraighted and which are lost. Hydrology study to understand potential reduction in catchment area (and impacts on forlow) Request for further specific details of mitigation measures assessment and BRM measures. (Includin ATHMM measures where relevant) from EA Si gudate to VM beavier data to chained 20% status. 	Any large watercourses should be realigned to provide lost habitat and flow into the main rives. Further details on itigation measures assessment from AA to identify a gopertunities to inprove the water body as part of the schem as	o 1	No	No	No	No
GB105030054515	TRUE Swaton Drains	3	Low	Low	 Drag with Cybin Joseph and Cybin Ghrag drag have publicly of the Second S	The reservoir will lead to the loss of approximately 28% of the cathment and therefore a reduction in flows in both channel lowed to offset loss of in-channel haldbard and/or watercourse length. Flow support these of in-channel haldbard and/or watercourse in the loss of loss of loss of the loss of loss	f 3	Yes	Yes	Yes	No
GB104028053110	TRUE Trent from Soar to The Beck	2	Low	Low	11 Dragning China and China dana Xina juan Sharing China and Xina Juan Sharing China and Xina Xina Xina Xina Xina Xina Xina Xina	Inglementation of best practice mitigation measures for the initials structure. Further valer quality modelling and monitoring (both continuous and spot sampling) is required to determine the extent of impacts on the tological quality g elements. This will help determine appropriate mitigation measures.	° 2	No	No	No	по
GB105030056780	TRUE Witham - conf Cringle Bk to conf Brz	nt 3	Low	Low	 On-going refinement of the design. Jeydrology study to understand the impact of increased flow in the cathement on hydrologial regrim and biologial status elements. Water quality modelling and monitoring (both continuous and system) and the understand the impact of changes in water quality and therefore biology due to the clicknarge. Request for further specific details of mitigation measures assessment and RBMP measures (includin AFHMMB measures where relevant) from FA S judget to WTD bearlies data to funde 2009 statu in line with Cycle 3 2021-2027 RBMPs conce published 0- Hydraulic modelling to understand the impact on 0- Hydraulic modelling to understand the impact on 	INIS treatment has been provided between the River Trent abstraction and the transfer to the River Witham Further water quality modelling (both continuous and spot sampling) is required to determine the extent of impacts witt gives catchment. This will help determine appropriate mitigat measures. 1	bin on	Yes	Yes	Yes	No
GB105030062370	Witham - conf Brant to conf Catchw Drain	ter 3	Low	Low	Iter and velocity as a result of the abstraction 10 or again grantment of the dosity of the abstraction of the strain of the strain of the strain of the strain of the regime and bolgical status: elements. 30 Water quality modelling and monitoring both continuous and sol sampling) to understand the impact of changes in water quality and therefore biology due to the discharge, 4) expects for further specific details of mitigation measures assessment and BMP measures (includin AFHMM measures where relevant) from EA 3) update to VMD boseline data to chande 2005 status 0) update to VMD boseline data to chande 2005 status 0) update to VMD assessment and BMP measures (includin 4) Hymail: modelling to understand the impact on 4)	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham Further water quality modelling (both continuous and spot sampling) is required to determine the extent of impacts with griss catchment. This will help determine appropriate mitigat measures.	hin on	Yes	Yes	Yes	No
GB205030062425	TRUE Wilham - conf Calchwater Drain to c Bain	onf 3	Low	Low	1) On-going orthorement of the disign. 2) hydrolog study to understand the impact of increased flow in the cathement on hydrologial regime and biologial status elements. 3) Water quality modelling and monitoring (both continuous and so sharping) to understand the impact of charges in water quality and therefore biology due to the charbary. 4) expanses for further specific due tails of mitigation ArHVMB measure where relevant (from 6). 5) ArHVMB measure where relevant (from 6). 5) ArHVMB measure where relevant (from 6). 5) ArHVMB measure where relevant (from 6). 6) Hydraulic modelling to understand the impact of 6) Hydraulic modelling to understand the impact on flow and velocity as a result of the battraction	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham Further water quality modelling (both continuous and spot sampling) is required to determine the extent of impacts with the cathement. This will help determine appropriate mitigat measures.	1 hin on	Yes	Yes	Yes	No
GB205030062426	TRUE Lower Witham - conf Bain to Grand	Stuice 3	Low	Low	 On-going refinement of the design. J-bydrology study to understand the impact of increased flow in the cathement on hydrologial regime and biologial status elements. Water quality modelling and monitoring (both continuus and system) and the understand the impact of changes in water quality and therefore biology due to the dischange. Market and therefore and the second system and the second monstress and second systems and the second monstress and second systems and the second monstress and second second second systems and ArMWdB measures where relevand if rom 5A Si update to WFD baseline data to include 2019 status in lines with circles 2021-2027 BBWS are second the impact on Bow and velocity as a result of the bastration 	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham Implementation of best practice mitigation measures for the intale structure. Further water quality modiling tooth continuous and spot sampling is required to determine the determine appropriate mitigation measures.	3	Yes	Yes	Yes	Assumes that abstraction from this waterbody will be timed to coincide No with the discharges into the upstream waterbody (08/19500056780) to ensure no net loss in flow downstream of abstraction point

Image: state in the state	Option	SLR41	Go to RNAG/PoM table at bottom of the page																					
And bit is an interview of the second se	Waterbody ID	GB105030056520								Activity			Now in	spounding reservoir (in line/next to watercourse, or la	arge compared to watercourse) - excluding abstract	xn/discharge		м	intenance of pipe lines (including draining pipe	fine)		New pipe lines involving watercours	se crossings with no in channel modifications	Below ground structures (shaft/retaining wall) with associated dewatering
victor victor victor <td>Waterbody name</td> <td>South Beck</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Constru</td> <td>ruction, Operation or Decommissioning activity</td> <td>ÿ</td> <td></td> <td>Constructio</td> <td>n and operation</td> <td></td> <td></td> <td></td> <td>Operation</td> <td></td> <td></td> <td>Construct</td> <td>tion and operation</td> <td>Operation</td>	Waterbody name	South Beck								Constru	ruction, Operation or Decommissioning activity	ÿ		Constructio	n and operation				Operation			Construct	tion and operation	Operation
Note in the second s	Waterbody type	Rver								Potent embed	itial Impacts of asset (following consideration o idded mitigation)	of	Changes to channel footprint	Noise and vibration	Changes in flow velocity and volume (increase o decrease)	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Noise and vibration	Changes in flow velocity and volume (increase or decrease)	Changes in sedimentation deposition	Change in water quality due to new or chang to existing discharge of surface water into surface water body	ges Change in INNS present in surface wat body	er Changes in sedimentation deposition	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Change in water quality due to discharge of groundwate to a surface water body
N <th< td=""><td>Hydromorphological designation</td><td>Heavily Modified</td><td>Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM table.</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Biologi</td><td>gical Effects</td><td></td><td>×</td><td>1</td><td>~</td><td>1</td><td>1</td><td>~</td><td>~</td><td>1</td><td>~</td><td>1</td><td>4</td><td>J.</td></th<>	Hydromorphological designation	Heavily Modified	Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM table.							Biologi	gical Effects		×	1	~	1	1	~	~	1	~	1	4	J.
Normal problem Nore	Overall status	Poor								Hydron	omorphological supporting elements		1	1	~	1	×	×	×	×	×	1	4	·
	Overall status objective	Moderate by 2027								Physics	cochemical Effects		×	×	×	×	×	1	1	1	1	×	×	V
Appendix Appendix <t< td=""><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td>Does t</td><td>he component comply with W (nost mitination)</td><td>/FD objectives Chemic</td><td>ical effects</td><td></td><td>×</td><td>×</td><td>×</td><td>x</td><td>×</td><td>1</td><td>4</td><td>1</td><td>4</td><td>×</td><td>×</td><td>×</td></t<>				-				Does t	he component comply with W (nost mitination)	/FD objectives Chemic	ical effects		×	×	×	x	×	1	4	1	4	×	×	×
And a	WFD status Component	WFD quality diement	M othod of chooking compliance	Classification	Objective		Impat sore Descriftere	Design certainty Deer tor atom between saturchisers	Imp odmo ms to CES/ CEP	Campranises water body dbjecitives E	ation applied	Postmiligalianimpact score	Comment of the Impact of "Changes to channel footprint" on each element	Comment of the impact of 'Noise and vibration' or each element	Comment of the impact of 'Changes in flow velocity and volume (Increase or discrease)' on each element	Comment of the Impact of 'Changes towater body hydromorphology leading to changes in inver processes and habitats upobleam and downstream' on each element	Comment of the impact of 'Naise and vibration's each element	in Comment of the impact of 'Dhanges in flow velocity and volume (Increase or decrease)' on each element	Comment of the impact of 'Changes in sedimentation deposition' on each elemen	Comment of the impact of "Dhange in water quality due to new or changes to existing dischange of variance water into surface wate body' on each element	Comment of the impact of 'Drange in INMS present in sufface weber body' or each element	Comment of the impact of 'Changes in sedimentation deposition' on each element	Comment of the impact of "changes to watter body hydromorphology isaafing to changes in niver processes a habitats upstream and downstream" on each element	Commont of the impact of 'Change in water quality due nd discharge of groundwater to a surface water body' on each element
Image: space s	Biological quality elements	Fish	Guidance document available	Paar in 2015 Good in 2015	Moderate by 2027		1 Lo 1 Lo	v Low No	No	No Furtho determ No	er water quality modelling is required to mine the eatent of impacts within this ment	1	The reserveir footprint will result in a loss of some small field darinage channols. This will lead to the local-tock for a dhabitat. Since all the channels locat are maintained field discher, regular diredging an maintainers are Niedly to alwady impact on the habitat value and thendrone this is encrement has provide to failed field of an and thendrone this is encrement has provide to failed field of an and thendrone this is encrement has provide to failed field for an and thendrone this is encrement has provide to failed field for an and thendrone this is encrement has provide to failed field for an and thendrone the local sectors of the provide to the sector of the field for an and thendrone the local sectors of the provide to the sectors of the se	Noise and vibration may impact the biological quality elements within this watartody as a rocult of the construction of of the reservoir. Potential temporary distubance during construction, though fish are likely to move away from the one and incorrective accilement/herbit.	The reserveir footprint will result in a loss of approximately -4% of the catchment and the loss some small field drainage channels. This loss will lead to small reduction in flow and velocity, while end the source to be identicat an antipic demonth.	The insurvier hostprint will result in loss of some small field damage dithes, which could lead to a sight reduction in the file of and velocity into the South Bock which these channels damines the scale of the southcrin in flow is lawly to be mirror compared to the cathermost site for these webscurses, but could lead to enter twink on during on the south body and and and the south of th	Noise and vibration may impact the biological op elements within this waterbody as a result of the construction of the pipelines. Potential temporar disturbance during construction, though fish are Rickly to move away from the area and macroph	ality y No measurable offects anticipated as result of changes in flow and velocity ytos	Nomeasurable effects anticipated as a res of changes in sedimentation deposition	No measurable offects anticipated as a result of changes in water quality due to new change existing discharge of surface water into surf water body	It of No measurable effects anticipated as result of changes in 11MS present in the surface water body.	No measurable effects anticipated as a result of changes sodimentation disposition on the biological quality eleme At this stage it is assumed contruction will involve tennihoss activities.	in No measurable effects antispated as a result of changes i res. Hydernerphology on the biological quality elements. Att stage it is assumed costruction will involve trenchless activities.	Bicharge of groundwater to surface water during Kicharge of groundwater to surface water during Kich could had to temporary minor localised effects o biclogial quality elements
n n		Macrophytes and Phytobenthos Combined	Calculator available	Poprin 2015	Moderate by 2015		1 Lo	v Low No	No	No		1	biological quality elements.	unlikely to be sensitive to impact	s could impact of biological quality services.	changes in hydromorphology	and intvertebrate unlikely to be sensitive to imp	et					/	
Image: serie	Hydromosphological Supporting Elements	Hydrological Rogime		Doos Not Support Good in 2015	Does Not Support Good by 2015		1 Lo	v Low No	No	No Assum Implan	nes best practice measures will be mented	1	No measurable effects anticipated as a result of change in channel footprint	No measurable effects anticipated as a result of noise and vibration	The size of the reservoir footprint will result in a loss of approximately 4% of the california and to loss of some small field drainage channels. This loss will lead to small reduction in flow and veloci in an antertody where hydrological regime alread does not support good	e No maxumble effects enficipated y is a result of change in hydromorphology y						No measurable effects anticipated as a result of changes sodimentation disposition on the hydrological regime and mitigation measure assessment. At this stage it is assur- construction will involve transforms activities.	in No measurable effects anticipated as a result of changes i hydromorphology on the hydrological regime and miligat med measures assessment. At this stage it is assumed construction will involve transforms activities.	Dicharge of groundester to surface water during construction has the potential to impact the hydrological megime and therefore is assessed to be a minor localised exercical effect.
Apprint Apprint <t< td=""><td></td><td>Mitgation Measures Assessment</td><td></td><td>Moderate or less in 2015</td><td>Good by 2027</td><td></td><td>1 Lo</td><td>v Low No</td><td>No</td><td>No Further assess</td><td>er specific details of mitigation measures sment will be requested at the next stage.</td><td>1</td><td>The size of the reservoir footprint will result in a loss of some small field drainage channels, which could impact on the millination measures assessment.</td><td>No measurable effects anticipated as a result of noise and vibration</td><td>Minor localised impacts are expected to the mitigation measures assessment due to the inmasse in physical modification</td><td>Minor localised impacts are expected to the mitigation measure assessment due to the increase in physical modification</td><td>s</td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>No measurable effects anticipated as a result of changes in water quality</td></t<>		Mitgation Measures Assessment		Moderate or less in 2015	Good by 2027		1 Lo	v Low No	No	No Further assess	er specific details of mitigation measures sment will be requested at the next stage.	1	The size of the reservoir footprint will result in a loss of some small field drainage channels, which could impact on the millination measures assessment.	No measurable effects anticipated as a result of noise and vibration	Minor localised impacts are expected to the mitigation measures assessment due to the inmasse in physical modification	Minor localised impacts are expected to the mitigation measure assessment due to the increase in physical modification	s						1	No measurable effects anticipated as a result of changes in water quality
opport opp	Physico-chemical quality elements	Ammonia (total as N) Excelored corgion gH Phosphate Temporture	Namerical limits for classes Catisator available Namerical limits for classes	High in 2015 High in 2015 High in 2015 Paorin 2015 High in 2015	Cood by 2015 Cood by 2015 Cood by 2015 Modurate by 2027 Cood by 2015		1 Lo 1 Lo 1 Lo 1 Lo 1 Lo	v Low No	No No No No	No No No No No	her water quality modelling is required to lamine the extent of impacts within this catchment	1 1 1 1 1						No measurable offects anticipated as result of changes in flow and velocity	Nomeasurable effects anticipated as a res of changes in sedimentation deposition	No measurable effects anticipated as a result at changes in water quality due to new change existing discharge of surface water into surf water body	It of S in result of changes in INVS present in the surface water body			Clicitarge of groundwater to surface water during construction has the potential to have a temporary impa the physics-chemical elements and therefore is assesses to be a minor localise of fict. No measurable effects anticipated
Automatical Automatica	Specific pollutarits	Mecoprop		High in 2015	High		0 10	v Low Possibl	le Possible	Possible		0												as a result of changes in water quality
Analysic Andres	Return to top of the page	ы	Rolevant WPD Guality Elamont (IRNAQ / Museur e catagory 1 (PoM)	Category (FINAC)/Load organisation (FINI)	National Svimi Hoader (BNAG) / Title (PoM)	is this measure potential impacted by the scheme? (Viss/No)	assasment Dots confidence	Does 1 2- Assists 2- A	the component comply with W ent Impediment to GES/GEP es	VFD objectives Compromi ses water body objectives	Ation applied in 2 to	st mitigation pact score (- o 3)	Note: Morge columns if activity appears multiple times New impounding reservoir (in line/next to watercours, or larg compared to watercours) – excluding abstraction/dicharge	a										
Austral Paral Magnetic Magnetic<	Reasons for Not Achieving Good (RNAG)	486198	Phosphate	No sector responsible		No																		
Lander for LanderMarchM	Reasons for Not Achieving Good (RNAG)	486196	Phosphate	Water Industry	Pollution from waste water	No								_										
Appendix of Max Appendix Appendix of Max Appendix	Reasons for Not Achieving Good (RNAG)	520646	Macrophyles and Phylobenthes Combined	Water Industry	Pollution from waste water	No																		
	Reasons for Not Achieving Good (RNAG)	520790	Fih	Agriculture and rural land management	Physical modifications	Yes	0 Lo	v Low No	No	No None		0	Presence of a new physical modification (reservoir) is largely located away from the watercourse and is not expected to											
	Reasons for Not Achieving Good (RNAG)	520642	Macrophytes and Phytobenthos Combined	Agriculture and rural land management	Physical modifications	Yes	0 6	v Low No	No	No None		0	conflict with waterbody scale measures to reduce modification	5										

9	ption	SIR 41	Co to RNAC/Pold table at bottom of the page	1																		
	laterbody ID	GB105030056515		1					^	divity	New impo	nding revervair (in line/next to watercourse, or	r large compared to watercourse) - excluding abstraction/disch	n.5e		Maintenance of pipe lines	Including draining pipeline)		New pipe lines involving watercoary	e crossings with no in channel modifications	New W7W (set 1	ack from a watercourse]
	laterbody name	Swaton Drains							0	onstruction, Operation or Decommissioning activity		Construct	tion and operation	Janon 12 water body five proceduater materia to	0	Opr	ation Change in water quarts que to new or changes to	I	Contracti	ion and operation	6	nitution
	laterbody type	Ruer								stential impacts of asset (following consideration of mbedded mitigation)	Changes to channel footprint	Noive and vibration	Changes in flow velocity and volume (increase or decrease)	changes in river processes and habitats upstream an downstream	nd Changes in flow velocity and volume (increase or decrease)	Noise and vibration	existing discharge of surface water into surface water body	Change in INNS present in surface water body	Changes in sedimentation deposition	changes in river processes and habitats upstream are downstream	Noise and vibration	Change in water quality due to new or changes to existin
-	ydromorphological designat k	on Heavily Modified	Action: Obtain HMWR measures information from the Environment Agency to add to the RMAG/PdM table.							idogical Effects	~	~	~	1	4	~	4	~	~	×	4	×
0	actete llerov	Maderate							-	ydromorphological supporting elements	~	1	1	~	x	x	×	×	1	×	x	x
0	vetali status objective	Good by 2027							21	tysicachemical Effects	×	x	×	x	4	×	~	1	×	×	×	×
_							Does the	component comply with ((post mitigation)	WFD objectives	ternical effects	×	×	×	x	×	v	~	~	×	x	~	×
	FD status Component	187D quality element	Method of decking compliances	Constitution	Objective	Input some	Designeentainty Deericration between status diasees	Periodic sector to CL 5/0 FF	Compromises writter book objectives	Trigation applied (1) 2000	Comment of the impact of 'Dranges to channel footprint' on eac element	Comment of the impact of Noise and elocation: on each element	Comment of the impact of 'Ohanges in flow velocity and volume (increase or discresse)' on-each element	Comment of the impact of 'Oranges to vaster body hydromorphology isading to sharpes in river process and habitats spatnam and downetream' on each element	ue Comment of the impact of 'Damps-in flow velocity and volume (increase of docrase)' on-such-element	Comment of the impact of Yildise and vibration' on each element	Comment of the impact of 'Drange in water quality due to new or changes to existing discharge of surface water into surface water body' on each element	Commonit of the impact of 'Change in MMG present is surface water body' on each element	n Camment of the impact of 'Changes in sudmentation deposition' on each element	Communit of the legact of 'Danges to water body tydomorphilogy leading to danges in river process and habitats updream and downfream' on each element	Comment of the Impact of Wolke and vibration' on each element	Comment of the impact of Change is water quality due t new or changes to existing discharge of surface water int surface water body' on each element
	Biological quality element	¹ Insertidization	Suldena document available	Good in 2015	Gened by 2015	2 600	Low Yes	bes	Yes 7	ny valotanisi extensionev vhadd be aligned where agergetate.	De rearest logation will easil as a loss of approximation 2.5m of ages subsequences and will effectively user the Readerst or of the one main Sector Carlow and reasons have been ages or advances to good ages and the sector and loss ages of advances to good ages and a sector and loss ages of advances of the loss areas of the region where effects	Noise and vibration may inpact the biological quality elements within this workership as a result of the contraction of the reservoir- elemental temporary distutance during contraction, through investibutions unlikely to be weaklive to impact	Sournair will be contracted over the happent of the anteresting, effectively avaining the happents from the four results of the activities (b) will reall in the line (or activities) of the activities (b) will reall in the four results of the matching categories of the appendix of the the second of the activities of the result of the the second of the activities of the activities of the second of the activities of the activities of the second of the activities of the result of the biological guilty denereis.	Remote will be continued over the todgeted of watermane, effectively evening the basebasies in the lower reaches of the activities. The will result in low of approximativity 20% of the waterbady activates directly are basebased in the temperature additionation are regardless in the the watercome, which acculatings cont the watercome, which acculatings cont the watercome, which acculatings cont the watercome, which containings cont adjustment phology and in turn on the todgeted qualit alterets.	No mon control No meaurable effects anticipated to biological qualit elements as a neutral of temporary and holmquert durage inflow due to pipeline draking	to muutable effects anticipaned to bioingicit quality elements us a read; of lengoary and elements and elements due to glotten d'along lever detators Redy to be intensitive to change	No measurable effects anticipated to biological quality elements was result of temporary and interpart change invasiter quality due to positive chaning	No micaunable effects anticipated to biological quat elements as a result of temporary and inhequent dictorarys due to pipeline draining	Is resurable effects anticipated as a result of theory is underwraition deposition on the biological gaility elevents. At this stopp it is assumed construction will involve trenchless activities.	Somewarble effects antigated as a result of decays in hydromorphilog on the biological quality and elements. At this stage it is assumed construction wit involve trenchine activities.	Non-manurable effects anticipated to biological quality elements to a securit of mole and elaration during construction of the new WWW low-relates likely to be intensible to change	No measurable effects anticipated to biological quality elements as a result of construction of the new WWW
		Hydrologial Rogime		Ngh in 2015	Supports Good by 2015	2 1.04	kow Yes	Yes	Yes	ny substantial watersources should be aligned schere appropriate.	Nervoir will be canatustical over the florightst of the externance, and will reach in the loca of approximately 20% of the austeriody joingh withis the autoinment. This available tast loca is not architecter and the unversion of the headwards in the lower catability within the unversion of the major adverse impact on the hydrological regime.	No measurable effects art logated as a result of noise and vibration	Americal wall be constructed over the footprint of the watercourse, effectively evening the backwater, then is lower reactive of the activities. The visit in wall is the low 20% of the waterbody cathement directly low beneating the reservoir. The watercourse, which would impact on the hyphological regime.	to maxable effects anticipated as a result of hydromorphology changes	No measurable effects anticipated as a result of temporary and inhequent change in for due to pipeline draining	×			No meanarable effects anticipated as a result of	No measurable effects antigated as a result of		
	Hydromorphological Support Elements	long Miligation Measures Assessment		Maderate or leve in 2015	Good by 2027	3 Low	Low Yes	Yes	Yes.	ny substantial vaterosaries should be aligned where appropriate.	Reversal' will be constructed over the bodypist of the watercoares, and will result in the loss of approximately 20% of the scalarbody length with the achiever. The social loss in a rule radown bit of gene channel, which Body to load to a deception in the mitigation measures sourcewat	No measurable effects and Expansed as a result of noise and vibration	Reservoir will be annehraded over the bodgetet of the watermane, efficiency average the baddwaters have be also anneae and the addwaters baddwaters have the the baddwaters and the baddwaters baddwater baddwater proportionality 25% of the sum and badd to an engine baddwater barward in the manyon. This wald badd to an engine baddwater induction in these and therefore dranges to the regime in the addwaters. Sime or indigated measure due to flow changes may accord	Reservoir will be constructed over the loopprint of the externary, otherwise yourship the headswares he beliaver radees of the authorism of New UP next the loss of approximative 20% of the externary authorism of encyclic particular sectors and authorism of encyclic particular sectors and harders and approximative and approximation of the authorism in the cathernest. Some impacts on mitigation measures due to be dimensional to encyclicate approximation and approximation and particular approximation and approximation and in the cathernest. Some impacts on mitigation measures due to be dimensional theory may approximate the source approximation of the approximation and approximation and the approximation of the approximation approximation and approximation approximat	ne nor n n n				shaqay in sudimentation deposition on the hydrological regime and mitigation measures assessment. At this staqui it is assumed construction will involve transform activities.	througes in hydromorphology on the hydrologial regions and religion measure, assessment. At this stage it is assumed construction will involve twenthis activities.		
		Anmonia (Islai av.N)		High In 2015	Good by 2015	1 Low	Low No	No	No	,												
		Discolund oxygen	Namerical limits for classes	Maderate in 2015	Good by 3015	1 Low	Low No	No	No	,												
P	hysico-chemical quality elem	arek (#4		46gh in 2015	Good by 3015	1 Low	low No	No	No	,					No measurable effects anticipated as a result of the changes in flow velocity and volume	No measurable effects anticipated as a results of the noise and vibration	No measurable impact anticipated as a result of now or changes to existing discharge of surface water into surface scalar body	No measurable impact anticipated as a result of r change in NNS present in the surface scatter body			No measurable impact anticipated on the physico- chemolalizers a result of noise and vibration	No measurable impacts anticipated on the physico-them as a neuth of changes to water quality.
		Proghete	Calculator available	Maderate in 2015	Good by 3027	1 Low	low No	No	No	,												
		Temperature	haverial limits for classes	Maderate in 2015	Count by 2015	1 Low	low No	No	No													
5	eturn to top of the p	100					Does the	component comply with 1	WFD objectives		Note: Merge columns if activity appears multiple times.											
						÷	in the second		1													

	-								Does the c	component comply with WFI	cbjectives			Note: Morgo columns if activity appears multiple times.
RNAG POM ANNAM	ы	Rolovant WED Quality Element (KMAG) / Measure category 1 (Pold)	Category (19442). Anad organisation (Pohl)	National Sumi Header (RNAG) / Title (PoM)	is this measure potential impacted by the scheme? [/es/Nc]	In put sore assessment	Data corridente	Designationalisty	Assists attainmen t of water body objectives	Impedment to GES.GEP	Compram ses water body objectives	Mitigation applied	Post mitigatio impact score (2 to 2)	New impounding reservoir (in line/heat to waterzourse, or large compared to waterzourse) - excluding abstraction/discharge
Reasons for Not Achieving Good (RNAG)	\$22164	Hydrological Regime	No sector responsible	No further action (Flow is below the EFI but NOT causing an ecological billure)	Yes		Low	Low	No	Yes	Yes	Any substantial watercourses should be	2	Flow in both channels likely to be reduced by this option leading
Reasons for Not Achieving Good (RNAG)	\$32166	Hydrological Regime	No sector responsible	No further action (Flow is below the EFI but NOT causing an ecological billure)	Yes		Low	Low	No	Yes	Yes	realigned where appropriate.	2	to a reduction in the improvements that can be made.
Reasons for Not Achieving Good (RNAG)	531336	Macrophytes and Phytoberthos Combined	Agriculture and rural land management	Physical modifications	Yes	2	Low	Low	No	Yes	Yes		2	Reservoir will be constructed over the footprint of the watercourse, introducing new physical modifications to the waterbody, leading to a reduction in the improvements that can be made.
Reasons for Not Achieving Good (RNAG)	523024	Macophytes and Phytobenthos Combined	Water industry	Pollution from warde water	Yes	2	Low	Low	No	Yes	Yes		2	
Reasons for Not Achieving Good (RNAG)	\$31035	Macophytes and Phytobenthos Combined	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Yes	Yes		2	Reserval: will be constructed over the footprint of the statercourse, effectively severing the headwaters from the
Reasons for Not Achieving Good (RNAG)	\$29820	Macophytes and Phytobenthos Combined	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Yes	Yes	realigned where appropriate. Flow support	2	ower reaches of the catchment. This will result in the loss of approximately 28% of the waterbody catchment directly lost
Reasons for Not Achieving Good (RUAG)	\$29606	Phosphale	Water Industry	Pollution from waste water	Yes	2	Low	low	No	Nes	Yes	considered to support flows, but would need	2	beneath the reservoir. This would lead to an major adverse reduction in flow in the watercourse, leading to less dilution of
Reasons for Not Achieving Good (REAG)	\$29607	Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	low	No	Yes	Yes	quarty.	2	pollution, potentially leading to a reduction in the mprovements that can be made.
Reasons for Not Achieving Good (RNAG)	\$31033	Phophate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Nes	Yes		2	

	Below ground structures (shaft/retaining wall) with
	Construction
	Change in water quality due to dicharge of
2	proundwarser to a surface water body
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	1
	×
	Comment of the Impact of 'Change in water quality due to distharge of groundwater to a surface water body' on each element
	Decharge of grandealter is autors water during contraction to the potential to impact the potential statist for indegras guality elements and investors this is amount to be a mitter localised effect.
	Discharge of groundwater to surface water during contruction has the potential to impact the hydrological regime and therefore is assessed to be a minor localised effect.
	Dicharge of groundwater is surface water during contraction, is unlikely to impact the mitgation futurates assessment.
	Talagnat genation is a fee on our airs man an an an an an an an a

Upton	SLR 41	Go to RMAG/PoM table at bottom of the page	_							1	1	1		1	1	Minus alon Boos (month from	· · · · · ·				1	1	1	
Waterbody ID	GB104028053110							Activity	New or modified pumping station and/or river inteko	New or increased surface water abstraction	New or modified pumping station and/or river intake	Maintenance of pipe lines (including draining pipeline)	New or increased surface water abstraction	New or modified pumping station and/or river intake	Maintenance of pipe lines (includie draining pipeline)	were peperanes involving watercourse crossings with no in channel modifications	New or increased surface water abstraction	New or modified purview station section	Maintenance of pipe lines (including draining pipeline)	New or modified pumping station and/or river intok-	New pipe lines involving watercourse crossings with n in channel modifications	Maintenance of pipe lines (including draining pipeline)	New or increased surface water abstractive	Maintenance of pipe lines (including draining pipeline)
Waterbody name	Trent from Soar to The Beck		-					Construction, Operation or Decommissioning activity	Construction	Operation	Construction	Operation	Operation	Construction	Operation	Construction and operation	Operation	new or mourne partying ration and of	diaming province	new of incomes party of antionand of their make		population of the second s		anni g pponto
	-		-					Potential Impacts of asset (following consideration of embedded										Construction	Operation	Construction Changes to water body hydromorphology leading to	Construction and operation Changes to water body hydromorphology leading to	Operation Change in water quality due to new or changes	Operation Change in water quality due to new or changes to	Operation
Waterbody type	Hever							migation	Changes to channel footprint	Changes to channel footprint	(increase or decrease)	(increase or decrease)	Changes in flow velocity and volume (increase or decrease)	Charges in sedimentation deposition	changes in sedmentation deposition	changes in sedimentation deposition	Changes in sedimentation deposition	Noise and vibration	Noise and vibration	changes in river processes and habitats upstream and downstream	changes in river processes and habitats upstream and downstream	to existing discharge of surface water into surface water body	eesting discharge of surface water into surface water body	thange in INNS present in surface water body
Hydromorphological designation	Heavily Modified	Action: Obtain HM/WBmeasures information from the Environment Agency to add to the RMAC/PoM table.						Biological Effects	4	4	×	1	J	×	4	~	~	~	4	1	~	×	4	~
Overall status	Moderate							Hydromorphological supporting elements	4	4	~	1	J	~	×	4	1	~	×	1	4	×	4	×
Overall status objective	Moderate by 2015		-					Physicochemical Effects	×	4	×	1	×	×	1	×	1	×	1	×	×	1	4	4
						Does the	component comply with WFD objec	Clivis (hospiral/flottr	×	×	×	,	~	×	,		×	*	1	~	~	1	~	×
			-	1		-	(post mitigation)	Childrent Childr	,	*	,	,	*	,	3	,	,	,		,	,	ÿ	^	,
					8	anty botwee	a solution	8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9			Comment of the innert of 'Chanaes infine	Comment of the impact of "Changes in from			Comment of the impact of "Dhamu	s Comment of the impart of Vibarra	es Comment of the impact of 'Channes in			Comment of the impact of "Changes to water body	Comment of the impact of 'Changes to water body	Comment of the impact of 'Change in water	Comment of the impact of "Change in water	Comment of the impact of 17hanne in
WFD status Component	WFD quality element	Method of checking compliance	Classification	Objective	pact so	gnost as day	ents to	Mitigation applied	Comment of the impact of 'Changes channel footprint' on each element	to Comment of the impact of 'Changes to channe footprint 'on each element	I velocity and volume (increase or decrease) on each element	 velocity and volume (increase or decrease) on each element 	Comment of the impact of 'Changes in flow velocity and volume (increa- or decrease)' on each element	se Comment of the impact of 'Changes in sedimentation deposition' on each element	in sedimentation deposition' on each element	in sedimentation deposition' on earth element	sedimentation deposition' on each	Comment of the impact of 'Noise and vibration' on each element	Comment of the impact of 'Noise and vibration' on each element	hydromorphology leading to changes in river processes and habitats upstream and downstream' on	hydromorphology leading to changes in river processes and habitats upstream and downstream' or	quality due to new or changes to existing discharge of surface water into surface water	quality due to new or changes to existing discharge of surface water into surface water	INIS present in surface water body' on each element
					E	Deta Deta sta	mipedu	and a second sec								Call Contraction				each element	each eikment	body' on each element	body' on each element	
						_	5 5	3					Changes in flow and velocity caused by the new abstraction may have			No measurable effects anticipated								
									New intake structure anticipated to	New abstraction anticipated to have limited	Localised changes to flow velocity around	Temporary infrequent localised changes to	impacts downstream. It should be noted that intake is located downstream from new outfall / discharge into the River Witham and it is	Changes in flow volume and velocity as a result of new intake could lead to localised	Temporary infrequent localised changes to flow unlikely to effect	as a result of changes in sedimentation deposition on the	Changes in flow volume and velocity could change sedimentation pattern,	Potential temporary disturbance during		New structure not anticipated to affect	No measurable effects anticipated as a result of changes in changes to the hydromorphology on the	Temporary infrequent localised changes to	Changes in water quality could occur due to the	Temporary infrequent discharges from pipeline maintenance unlikely to impact
	Invertebrates	Guidance document available	Good in 2015	Good by 2015	2	Low Low Possible	Possible Po	could be added a set of impacts within this catchment	have limited footprint, minimal effe on biological quality elements	ct footprint, minimal effect on biological quality elements	intake expected to have minimal effect on invertebrates	flow velocity expected to have minimal effect on invertebrates	assumed that it will adstruct the same if not similar amount of water as i discharged upstream. Despite this supporting flow, changes in local	changes in sediment deposition which is anticipated to have minimal effect on the	sedimentation and expected to have minimal effect on	biological quality elements. At this stage it is assumed construction	downstream of the abstraction, this could lead to changes in habitat	construction, though invertebrates likely to insensitive to noise	remporary intrequent localised noise unlikely to effect invertebrates	hydromorphology up and downstream, minimal effect on biological quality elements	biological quality elements. At this stage it is assumed construction methods will comprise of trenchless	water quality unikely to as pipeline would contain raw water from this waterbody. No	new abstraction due to changes in daution. Further investigation is required to determine the	on INNS as pipeline would contain raw water from this waterbody. No impact
													impact on biological quality elements, but to an uncertain extent. Furthe investmation is received	tiological quality elements	invertebrates	methods will comprise of trenchies actitivies.	effecting invertebrates.				activities.	impact anticaption on inversionalists	potential impacts of biological quality demants.	anticapted on invertebrates
Biological quality elements													Phonese in flow and watering caused by the new abstraction may base											
													impacts downstream. It should be noted that intake is located downstream from new or shall / discharge into the River Witham and it is	Changes in flow volume and velocity as a	Temporary infrequent localised	No measurable effects anticipated as a result of changes in	Changes in flow volume and velocity				No measurable effects anticipated as a result of	Tommrary informent localised channes to	Channes in water maility could arrun due to the	Temporary infrequent discharges from
	Macrophytes and Phytobenthos Combined	Calcolator available	Moderate in 2015	Good by 2027	2	Low Low Possible	Possible Po	ssible Further water quality modelling is required to 2	New intake structure anticipated to have limited footprint, minimal effe	New abstraction anticipated to have limited to footprint, minimal effect on biological quality	Localised changes to flow velocity around intake expected to have minimal effect on	Temporary infrequent localised changes to flow velocity expected to have minimal	assumed that it will abstract the same if not similar amount of water as i discharged upstream. Despite this supporting flow, changes in local	result of new intake could lead to localised changes in sediment deposition which is	changes to flow unlikely to effect sedimentation and expected to	sedimentation deposition on the biological quality elements. At this	could change sedimentation pattern, downstream of the abstraction, this	Potential temporary disturbance during construction, though invertebrates likely	Temporary infrequent localised noise unlikely to effect invertebrates	New structure not anticipated to affect hydromorphology up and downstream, minimal effect	changes in changes to the hydromorphology on the biological quality elements. At this stage it is assumed	water quality unlikely to as pipeline would contain raw water from this waterbody. No	new abstraction due to changes in dilution. Further investigation is required to determine the	pipeline maintenance unlikely to impact on INNS as pipeline would contain raw
									on biological quality elements	coements	invertebrates	effect on invertebrates	velocity and flow between the discharge and abstraction may still have impact on biological quality elements, but to an uncertain extent. Further	anticipated to have minimal effect on the tiological quality elements	have minimal effect on invertebrates	stage it is assumed construction methods will comprise of trenchler	could lead to changes in habitat	to insensitive to noise		on biological quality elements	construction methods will comprise of trenchess activities.	impact anticapted on invertebrates	potential impacts of biological quality elements.	anticapted on invertebrates
													investigation is required.			actiones.								
	A destant of Partices		Comment Constanting Dates	Connector Connection 2001			Durble Dr	It is assumed best practice design will be implemented	It anticipated there will be minimal	It anticipated there will be minimal effects on	Minor localised impacts are expected on the hydrological regime due to the change in flo	Temporary infrequent discharges are	Minorimpacts are expected on the hydrological regime due to the chan	Potential increased sedimentation due to		No measurable effects anticipated as a result of changes in	d Potential increased sedimentation due to abstraction not expected to have	No measurable impact anticpated on the		New structure not anticipated to affect	No more mable effects anticipated as a result of		No measurable impact anticipated on the	
Hydromorphological Supporting	nyatokajitai nagima		supports caudin zons	supports cloudly 2015		LOW LOW POSSES	POISEN	required to determine the extent of impacts.	effects on the hydrological regime.	the hydrological regime.	 velocity and volume rates as a result of the intake 	hydrological regime.	in flow velocity and volume rates as a result of the abstraction.	effect on the hydrological regime	•	sedimentation deposition on the hydrological regime and mitigation	significant effect on the hydrological regime	hydrological regime		hydrological regime	changes in changes to the hydromorphology on the budrological cosines and millipating measurer		hydrological regime	
Elements			Andreas active in MAT	Co. 45- 2022				It is assumed best practice design will be implemented for the intake structure. At the next stage, the	Minor localised impacts are anticipated, due to the intake	Minor localised impacts are anticipated, due to	Changes in flow and velocity unlikely to		Changes in flow and velocity unlikely to significantly affect physical	Potential increased sedimentation due to		measures assessment. At this sta it is assumed construction method	ge Potential increased sedimentation due is to abstraction not expected to have	No measurable impact anticpated on the		New structure not anticipated to affect	assessment. At this stage it is assumed construction motionle will comore of transition activities		No measurable impact anticipated on the	
	Neigation Measures Posissment		MODELER OF RES IN 2015	6668 by 2427		LOW LOW NO	NE	mitigation measures assessment will need to be requested.	structure increasing the physical modification pressures.	modification pressures.	pressure		modifications pressure	effect on mitigation measures		will comprise of trenchless actilityies.	significant effect on mitigation measures	mitigation measures assessment		the mitigation measures assessment.	internative comptite or tenanese accretes.		mitigation measures assessments	
	Ammonia (total as N)		High in 2015	Good by 2015	2	Low Low Uncertain	Uncertain Un	cartain 2																
	Biochemical oxygen demand	Numerical limits for classes	Good in 2015	No data available	2	Low Low Uncertain	Uncertain Un	certain 2								No measurable effects anticipate as a result of changes in the	a							
	Disselved revenen	Na marinal limits for classes	Contin 2015	Continu 2015	2	Inv Invertain	Uncertain Un	rotain 2							No measurable effects anticipated	sedimentation deposition on the					No measurable effects anticipated as a result of		Changes in water quality due to new abstraction has potential to affect physics chemical	
Physico-chemical quality elemen	s							Further water quality modelling is required to determine the extent of impacts within this catchment		It anticipated there will be minimal effects on the physico-chemical elements		result of changes in flow velocity and			as a result of changes in the sedimentation deposition on the		result of changes in the sedimentation		a result of changes in the noise and		changes to the hydromolphology on the physico- chemical elements. At this stage it is assumed	changes to water quality on the physico-	conditions, effects uncertain and would be subje- to further assessment	et result of changes in INNS present on the
	pH		High in 2015	Good by 2015	2	Low Low Uncertain	Uncertain Un	cortain 2				vourre on the physics-chamicals			phylisco-chemicals		depositor or the physics-one means		vidiation on the physico-orientais		activities.	Chittican		prysco-criemical elements
	Phosphate	Calculator available	Poor in 2015	Moderate by 2027	2	Low Low Uncertain	Uncertain Une	certain 2																
	Temperature	Numerical limits for classes	Moderate in 2015	Good by 2015	0	Low Low No	No	No															No measurable effects anticipated	
	Acid Neutralising Capacity	Numerical limits for classes	High in 2015	Good by 2015	0	Low Low No	No	No None required. 0																
	Anthenance	EDE deution	Constitu 2015	Good		In In No	No.	No. Non-maind																
	Personal		000112013					The Transit Traperty.																
	Benzo (b) and (k) fluoranthene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No measurable offerts anticipated as a			No measurable effects anticipate	d			No measurable effects anticipated as			No measurable efforts anticipated as a rosult of		
	Benzo (ghi) perelyene and indeno (123-cd) pyrene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				result of changes in flow velocity and volume on priority hazardous substances			as a result of changes in sedimentation deposition on priori	9			a result of changes in noise and vibration on priority hazardous			changes in water quality on priority hazardous substances		
	Berati(a)pyrene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0							hazandous substances				substances					
	Brominated diphonylisther (BDPE) Calc	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0																
Priority hazandous substances	Codmism and its Compounds	EDE deution	Constitu 2015	Good		In In No	No.	No. Non-maind																
			000112013					The Transit Traperty.																
	Hexachlorobenzene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0																
	Hexachlorobutadiene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0							No measurable effects anticipate	a			No measurable effects anticipated as					
	Hexachlorocyclohesane	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No measurable effects anticipated as a result of changes in flow velocity and			as a result of changes in sedimentation deposition on priori				a result of changes in noise and vibration on priority hazardous			No measurable effects antiopated as a result of changes in water quality on priority hazardous		
	Mentury and its Compounds	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				Volume on promy nazardods subsantors			hazardous substances				substances			SUBSTITUS		
	Nanviohenol	EQS directive	Good in 2015	Good	0	Law Law No	No	No None required. 0																
												No measurable effects anticipated as a			No measurable effects anticipate as a result of changes in	đ			No measurable effects anticipated as			No measurable effects anticipated as a result of		
	1,2-dicticity in the	EUS DIVENV	0000112015	600	Ŭ	LOW LOW NO	ND	None regarda. U				volumne on priority substances			sedimentation deposition on priori substances	9			vibration on priority substances			changes in water quality on priority substances		
												No measurable effects anticipated as a			No measurable effects anticipate	d			No measurable effects anticipated as			No measurable effects anticipated as a result of		
	bertweine	cus urêdinê	6660 m 2015	CCC .	0	LOW LOW NO	ND	None required. 0				result of changes in flow velocity and No measurable effects an established as a			as a result of changes in Submettation demotics and priori	8			a result of changes in noise and womensurate effects anteleated a			changes in water quality on priority substances		
	Chicopyrifes	EQS directive	Good in 2015	Good	0	Low No	No	No None required. 0				result of changes in flow velocity and webstrees on glothy substances			as a result of changes in sedimentation deposition on priori				a result of changes in noise and siltration on opicitie substances			changes in water quality on priority substances		
	Dichloromethane	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				result of changes in flow velocity and			as a result of changes in				a result of changes in noise and witration on price and			No measurable effects anticipated as a result of changes in water quality on priority substances		
Priority substances	Fluoranthene	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No measurable effects anticipation as a result of changes in flow velocity and			as a result of changes in	0			No measurable effects anticipated as a result of changes in noise and			No measurable effects anticipated as a result of charges in water quality on priority substances		
	Lead and its Compounds	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required.				No MERCENSION AND A CONTRACT OF AN ADDRESS AND A CONTRACT OF A CONTRACT			as a result of changes in	3			No WESTORIES STREET ANTERPORT AN a result of charges in noise and			No measurable effects anticipated as a result of		
	Adventure of the Process and	POT develop	County Date	0								No webstrate of offerty substances as a			sedimentation deposition on priori	8			wittation on priority antegance an			counges in water quality on priority substances No measurable effects anticipated as a result of		
	record and the Composition	Los within	add fr 2015		0	LOW NO	10	recrear requirida.		_		No website of changes in flow velocity and			as a result of changes in Submediation draveling any point	8			antesiant or changes in noise and nonitration on officity antidepotes a			changes in water quality on priority substances		
	Pentachlorophenol	EQS directive	Good in 2015	Good	٥	Low Low No	No	No None required. 0				result of charges in flow velocity and with more on reliable substances			as a result of changes in serimentation deposition on priori				a result of changes in noise and silitration on rejority substances			no measurable eneces anticipation as a result of changes in water quality on priority substances		
	Trichlorobenzenes	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No measurable effects anticipated as a result of changes in flow velocity and			No measurable effects anticipate as a result of changes in	a			No measurable effects anticipated as a result of changes in noise and			No measurable effects anticipated as a result of changes in water quality on priority substances		
	Trichioromethane	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No Missiurable effects anticipated as a result of changes in flow velocity and			No measurable effects antropate as a result of changes in	a la			Nomeasurable effects anticipated as a result of changes in noise and			No measurable effects anticipated as a result of charges in white quality, on priority or defente		
	Records.		LENE IN 2015	Veb		In In No	No	No. Non-maind				No Webstation of other and other and a			Not measuring depreciation of the provided of	3			witration on priority substances and a most of charges in price and			No measurable effects anticipated as a result of		
												No moderable article article article as a			No inclusionation description on	5			vibration on specific polygants no measurable effects anticipated an			changes shwater quality on specific pollutants. No measurable effects anticipated as a result of		
	Copper		High #12015	hýn	0	LOW LOW NO	No	None required. 0				result of changes in flow velocity and			as a result of changes in No intersectation description co.	2			a result of changes in noise and withting on smooth anti-tests			changes in water quality on specific pollutants		
Specific pollutants	iron		High in 2015	High	0	Low No	No	No None required. 0				result of changes in flow velocity and			as a result of changes in softmostation disposition on				a result of changes in noise and vitration on specific only to the			No measurable effects anticipated as a result of changes in water quality on specific pollutants		
	Marganese		High in 2015	High	0	Low Low No	No	No None required. 0				to measurable effects anticipated as a result of changes in flow velocity and			no measurable effects anticipate as a result of changes in				to measurable effects anticipated as a result of changes in noise and			No measurable effects anticipated as a result of changes in water quality on specific politions.		
	Tetrachioroethylene		Good in 2015	Good	0	Low Low No	No	No None required. 0				No meterative arrests and parts as a result of changes in flow velocity and			no intercontation deer all toppes as a result of changes in	2			No MERCINE OF STREET AND STREET AND A RESULT OF CHARDES IN DOISE AND			No measurable effects anticipated as a result of		
	Time		Mark in 2016	100		In In In		No. Non-				No measurable effects anticipated as a			No measurable effects anticipate	4			vitration on specific poly dants No measurable defects anticipated as			usanges ensurable effects anticipated as a result of		
	A88.		ngini zuis	191	U	LOW NO	10	reame receptified. 0				volume on other chemicals no measurable checks anticipation as a			as a result of changes in sedimentation deposition on other No measurable effects antiopass	5			vibration on other chemicals No measurable effects antropated at			changes in water quality on other chemicals		
	Aldrin, Dielidrin, Endrin & Isodrin	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				result of changes in flow velocity and no most make on their chemicals			as a result of changes in sedimentation deposition pointer				a result of changes in noise and no mitigation of the changes			changes in water quality on other chemicals		
Other chemicals	Carbon Tetrachloride	EQS directive	Good in 2015	Good	0	Low No	No	No None required. 0				result of changes in flow velocity and welvinge on other chemicals			as a result of changes in sedimentation depending on other				a result of changes in noise and subration on other changes?			No measurable effects anticipated as a result of changes in water quality on other chemicals		
	DDT Total	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required. 0				No measurable effects anticipated as a result of changes in flow velocity and			No measurable effects anticipate as a result of changes in	1			No measurable effects anticipated as a result of changes in noise and			No measurable effects anticipated as a result of changes in water quality on other chamicsis		
	Trichloroethykne	EQS directive	Good in 2015	Good	0	Low Low No	No	No None required.				No machinese contex sheepado as a result of changes in flow volveity and			ANT THE STATE AND A CONTRACT OF A CONTRACT O	5			No mitabligger offer determination and			No measurable effects anticipated as a result of		
												whence on other chemicals			sedimentation deposition on other				vitration on other chemicals			chariges in water quality on other chemicals		

Return to top of the page	1								Does the	component comply with WFD	objectives			Note: Merge columns if activity appea	rs multiple times
RNAG/POM/HHWMM	ы	Rolevant WFD Quality Element (RNAG) / Measure category 1 (PoM)	Category (RNAC)/Load organisation (PoM)	National Swmi Header (RNAG) / Title (PoM)	Is this measure potential impacted by the scheme? (Yes/No)	Impact score e assessment	Data confidence	Design con tainity	Assists attainment of water body objectives	Impediment to GES/GEP	Compromi ses water body objectives	Miligation applied	Post mitigation impact score (- 2 to 3)	New or modified pumping station and/or river intake	New or increased surface water abstraction
Reasons for Not Achieving Good (ov 53116	Miligation Masours Assonant	Nevigation	Physical modifications	No										
Reasons for Not Achieving Good (i	av 53318	6 Miligation Measures Assessment	Urban and transport	Physical modifications	Yes	1	Low	Low	No	No	No		1	New intake structure will be constructed in the footprint of the watercourse, introducing new physical modifications to the waterbody.	
Reasons for Not Achieving Good (I	INU 53103	6 Miligation Measures Assessment	Local and Contral Government	Physical modifications	Yes	1	Low	Low	No	No	No		1	However, this is a minor change to the physical structure with minor potential to affect other scheme to improve modification status	
Reasons for Not Achieving Good (I	RN 53103	4 Macrophytes and Phytobenthos Combined	Water industry	Pollution from waste water	Yes	2	Low	Low	No	Uncertain	Uncertain		2		Reduction in flow from new abstraction could lead to changes in water quality in the river, leading to a reduction in the improvements that
					Yes	2	Low	Low	No	Uncertain	Uncertain		2		can be made to water quality. Further Investigation needed to understand impacts on water quality.

Option		SLR 41	Go to RNAG/PoM table at bottom of t	the page																					
Waterbody ID		GB105030056780		7						Activity			Ma	aintenance of	of pipe lines (including drain	ing pipeline)				New discharge/transfer to a watercour	se or reservoir			New pipe lines involving watercourse crossi	ings with no in channel modifications
Waterbody nar	ne	Witham - conf Cringle Bk to co	onf Brant							Construction, Operation or Decommissioning acti	tivity	Operation	Operation	Oper	eration	Operation	Operation	Operation	Operation	Operation	Operation	Operation	Operation	Construction and operation	Construction and operation
Waterbody typ	2	River								Potential Impacts of asset (following consideration of mitigation)	embedded	Changes in flow velocity and	Changes in sedimentation			Change in water quality due to new or changes to existing discharge of	Change in INNS present in	Changes to water body hydromorphology leading to changes in river processes and habitats upstream	Change in water quality due to new or changes to existing discharge of surface water into surface			Changes in flow velocity and volume		Changes to water body hydromorphology leadi to changes in river processes and habitats	Changes in sedimentation
Hydromorphole	igical designatio	HeavilyModified	Action: Obtain HMWB measures information from the Environment							Biological Effects		volume (increase or decrease)	deposition	Nois	se and vibration	surface water into surface water	surface water body ✓	and downstream	water body	Change in INNS present in surface water bo	dy Changes in sedimentation deposition	(increase or decrease)	Changes to channel footprint	upstream and downstream	deposition
Overall status		Moderate	Anency to add to the RN&G/PoM							Hydromorphological supporting elements		~	×		×	×	×	4	×	x	1	4	1	~	J
Overall status	objective	Moderate by 2015		-						Physicochemical Effects		4	J		1	1	×	4	J	×	~	×	×	×	×
				-			E	loes the compone	nt comply with WFD object	V ^{es} Chemical effects		×	×		×	1	×	×	J	×	×	×	×	×	×
								(p	ost mitigation)																
WFD status Co	nponent	WFD quality element	Method of checking compliance	Classification	Objective	Impact scirre	Data confidence Design certainty	Deterocration between status classes	Impediments to GES/GEP Compromises wat	Mitigation applied	Postmitgation impact scire	Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element	Comment of the impact of 'Ch in sedimentation deposition each element	hanges n' on and	nment of the impact of 'Noise I vibration' on each element	Comment of the impact of 'Change in water quality due to new or changes to existing discharge of surface water into surface water body' on each element	Comment of the impact of 'Change in INNS present in surface water body' on each element	Comment of the impact of "Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream on each element	Comment of the impact of "Change in water quality due to new or changes to existing discharge of surface water into surface water body" on each element	Comment of the impact of 'Change in INNS present in surface water body' on each element	Comment of the impact of 'Changes in sedimentation deposition' on each element	Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element	Comment of the impact of 'Chan; to channel footprint' on each element	Comment of the impact of 'Changes to water by hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element	ody Comment of the impact of 'Changes in sedimentation deposition' on each element
Biological qu	ality elements	Fish		Good in 2015	Good by 2015	2 L	ow Low F	ossible	Possible Poss	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham. Def Further water quality modelling is required to determine the satent of impacts within this catchment	2	Temporary infrequent localised changes to flow velocity expecte to have minimal effect on fish	Temporary infrequent localis d changes to flow unlikely to el sedimentation and expected have minimal effect on fish	sed Tem effect nois- i to they sour	nporary infrequent localised se unlikely to effect fish as y will move away from the urce of the noise	Temporary infrequent localised changes to water quality unlikely to impact on fish	Temporary infrequent discharges from pipeline maintenance could lead to introduction of INNS as pipeline would contain raw water from another weiterbody	d Discharge of water into River Witham may lead to localised changes in sedimentation patterns and pathymetry This could be impactful to fish and	The source of the water from the River Trent is expected to decrease the water quality into the River Witham. It is anticpated there will be an amber adverse impact to fish and invertebrates. Further	The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer into the River Withom	Discharge of water into River Witham m lead to localised changes in sedimentation patterns and bathymetry. This could lead to changes in habitat in	Changes in flow and velocity caused by the new discharge may have impacts downstream. Changes in local velocity and flow between the discharge and abstraction may still have an impact or the biological quality elements, but to an uncertain extend. Further	Impacts are expected to fish and invertebrates as a result of a ne	No measurable effects anticipated as a result changes in the hydromorphology on the biological quality elements. At this stage it is avrauged one trution methods will comprise	No measurable effects anticipated as a result of changes in sedimentation deposition on the biological quality elements. At this of states it is assumed construction
		Invertebrates	Guidance document available	High in 2015	Good by 2015	2 L	ow Low F	ossible	Possible Poss	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham. Further water quality modelling is required to determine the extent of impacts within this matchered.	2	Temporary infrequent localised changes to flow velocity expecte to have minimal effect on invertebrates	Temporary infrequent local is changes to flow unlikely to et sedimentation and expected have minimal effect on invertebrates	sed effect Temj d to nois- inver	nporary infrequent localised se unlikely to effect ertebrates	Temporary infrequent local ised changes to water quality unlikely to impact on invertebrates	See INVS assessment for more details	invertebrates due to changes in habitat	imestigation is required to fully understand the water quality in the discharge area.		the watercourse impacting on invertebrates and fish	investigation is required. Hydroecology studysuggests that increased flow could make barriers less passablefor fish species.		trenchless actitives.	methods will comprise of trenchless actitives.
		Hydrological Regime		Supports Good in 2015	Supports Good by 2015	2 L	ow Low F	ossible	Possible Poss	It is assumed best practice design will be implemented for the intake structure. Hydraulic modelling required to understand the impact of increased flow.	2	Temporary infrequent discharge are anticipated to have minimal effects on the hydrological regime.	5					No effects are anticipated on the hydrological regime		No effects are anticipated on the hydrologi regime	cal No effects are anticipated on the hydrological regime	Changes to flow velocity and volume: hydromorphology of the channel would be changed by additional flow in channel, altering channel processes and conditions such as water depth an	No effects are anticipated on the hydrological regime	No measurable effects anticipated as a result sedimentation on the hydrological regime. At methods will comprise of trenchless actitivies	of changes in hydromorphology or this stage it is assumed construction i.
Hyaromorpholi Elei	igical supporting nents	Mitigation Measures Assessment		Moderate or less in 2015	Good by 2027	2 L	ow Low F	ossible	Possible Poss	It is assumed best practice design will be implemented for the intake structure. At the next stage, the mitigation measures assessment will need to be requested.	2							Changes in hydromorphology could lead to impacts on mitigation measures assessment		No effects are anticipated on the mitigatio measure assessment	Changes in sedimentation could lead to impacts on mitigation measures assessment	Changes in flow and velocity unlikely to significantly affect physical modifications pressure	witigation measures assessment include assessment of physical modification (water industry). The new discharge outfall structure could potentially increase the physical modification pressures this waterbody.	No measurable effects anticipated as a result e changes in hydromorphology on the mitigation measures assessment. At this stage it is assumed construction methods will comprise trenchless actitivies.	No measurative effects anticipated of as a result of changes in sedimentation deposition on the mitigation measures assessment. of At this stage it is assumed construction methods will comprise of frenchless actitives.
		Ammonia (total as N)		High in 2015	Good by 2015	з г	ow Low	Yes	Yes Ye										A high level value quality assessment of the methods of the second set of the secon						
		Blochemical oxygen demand	Numerical limits for classes	High in 2015	No data available	1 L	ow Low	No	No N		1								A high level water quality assessment of the proposed transfer from the River Tent to the River Witham, suggests that BOD could decrease by 13%. Further investigation is required to fully understand the impacts the discharge will have on the cathtment, but a reduction in BOD is especied to have no impact.						
		Dissolved oxygen	Numerical limits for classes	High in 2015	Good by 2015	1 1	ow Low	No	No N	Further water quality modelling is required to	1	No measurable effects	No measurable effects antici	ipated Norr	measurable effects	No measurable effects anticipated		No measurable effects anticipated as a result of	A high level water quality assessment of the proposed transfer from the River Trent to the River Witham, concludes there is an expected 1% decrease in dissolved oxygen by the time it reaches the Lower Witham- conf Oringle Bk to conf Brant extrement. Further investigation is required to fully understand the impacts the discharge will have on the constant of the second sec	No measurable effects anticipated as a res	uit Minor local Lead impacts are expected				
nysico-chemica	l quality elemen	рH		High in 2015	Good by 2015	1 L	ow Low	No	No N	determine the extent of impacts within this catchment	1	changes in flow and velocity on the physico-chemical elements	sedimentation deposition on physico-chemical elements	n the in no phys	ioise and vibration on the sico-chemical elements	quality on the physico-chemical elements		changes in hydromorphology on the physico- chemical elements	Calculations of a precadional y users and regrigute A high level water quality assessment of the proposed transfer from the River Trent to the River Witham, concludes there is an expected % increase in pH by the time it reaches the Lower Witham.conf Oringle Bix to conferent cathement. Further investigation is required to fully understand the impacts the discharge will have on the cathement.	et changes in to the INN's on the physico chemical elements	the physico-chemicals				
		Phosphate	Calculator available	Moderate in 2015	Moderate by 2015	а (ow Low F	ossible	Possible Poss	Me									proposed structure from the filter fromt to the biose- thanse, modeled where is an expected 7%. When, modeled where is an expected 7% bioset with the structure of the structu						
		Temperature	Numerical limits for classes	Good in 2015	Good by 2015	1 1	ow Low	No	No N		1								A high level water quality assessment of the proposed manifer from the River Trent to the River Witham, concludes there is an expected 1% increase in temperature by the time it treaches the Lower Witham - conf Oringle Bk to conf Brant at Lohment. Further investigation is required to fully understand the impacts the discharge will have on the catternet. One aprecautionary basis an neoligible						
Priori ty hazar	lous substances	Acid Neutralising Capacity	Numerical limits for classes	High in 2015	Good by 2015	0 L	ow Low	No	No N	None required.	0					as a result of changes from			changes from temporary infrequent localised						
		Nonylphenol	EQS directive	Good in 2015	Good	0 L	ow Low	No	No N	None required.	0					as a result of changes from temporary infrequent localised			changes from temporary infrequent localised pineline discharges						
Prioritys	ubstances	Diuron	EQS directive	Good in 2015	Good	0 L	ow Low	No	No N	None required.	0					as a result of changes from temporary infrequent localized			changes from temporary infrequent localised						
Specific	nollutantr	Copper		High in 2015	High	0 L	ow Low	No	No N	None required.	0					no measurable effects anticipated as a result of changes from temporary infraquent localized			no measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges						
specific	ponalalits	Iron		High in 2015	High	0 L	ow Low	No	No N	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised			No measurable effects anticipated as a result of changes from temporary infrequent localised nineline discharges						
Other	hemicals	Zinc		High in 2015	High	0 L	ow Low	No	No N	None required.	0					as a result of changes from temporary infrequent localised			No measurable effects an ucipated as a result of changes from temporary infrequent localised nineline discharges						

Return to top of the page									Does the	component comply with WFI) objectives			
RNAG/PoM/HHWMM	ld	Relevant WFD Quality Element (RNAG) . Measure category 1 (PoM)	Category (RNAG)/Lead organisation (PoM)	National Swmi Header (RNAG) / Title (PoM)	Is this measure potential impacted by the scheme? (Yes/No)	Impact some assessment	Data confidence	Design orrhinty	Assists attainmen t of water body objectives	Impediment to GES/GEP	Compromi ses water body objectives	Mitigation applied	Post mitigation impact score (- 2 to 3)	New discharge
Reasons for Not Achieving Good (RNAG)	53318/	6 Mitigation Measures Assessment	Agriculture and rural land management	Physical modifications	Yes	1	Low	Low	No	No	No		1	New intake structure will be constructed over the footprint of the watercourse, introducing new
Reasons for Not Achieving Good (RNAG)	53103	6 Mitigation Measures Assessment	Local and Central Government	Physical modifications	Yes	1	Low	Low	No	No	No		1	waterbody, affecting other scheme to improve modification status
Reasons for Not Achieving Good (RNAG)	53318	4 Phosphate	Water Industry	Pollution from waste water	Yes	2	Low	Low	No	Possible	Possible		2	A high level water quality review suggests that the new discharge into this waterbody will increase
Reasons for Not Achieving Good (RNAG)	531034	4 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible		2	the phosphate concentration, potentially leading to a reduction in the improvements
Reasons for Not Achieving Good (RNAG)	53103	5 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible		2	that can be made to water quality. Further investigation into water quality needed
Reasons for Not Achieving Good (RNAG)	52882	To control or manage point source 0 inputs		P limit at Long Bennington STW	No									

Option	SLR 41	Go to RNAG/PoM table at botton	n of the page													
Waterbody ID	GB105030062370								Activity				New transfer in	the watercourse		
Waterbody name	Witham - conf Brant to co	onf Catchwater Drain							Construction, Operation or Decommissioning ac	tivity	Description .			0	0	0
Waterbody type	Piwor		-						Potential Impacts of asset (following considerat	tion of	operation	Operation	Operation	Changes to water body hydromorphology leading to changes in river processor and babitate unchange and	Change in water quality due to new or changes t existing discharge of surface water into surface	operation
waterbody type	NVCI	Action: Obtain HMWB measures							embedded mitigation)		Changes to channel footprint	Changes in flow velocity and volume (increase or decrease)	Changes in sedimentation deposition	downstream	water body	Change in INNS present in surface water body
Hydromorphological designatio	n Heavily Modified	information from the Environment Agency to add to							Biological Effects		1	<i>J</i>	1	√	4	√
Overall status	Moderate		_						Hydromorphological supporting elements		1	<i>J</i>	1	√	~	√
Overall status objective	Moderate by 2015								Physicochemical Effects		1	×	√	<i>v</i>	~	√
	1	T	1				Does the o WFD obje	component comply w ctives (post mitigation	th n)		×	×	×	×	~	×
WFD status Component	WFD quality element	Method of checking compliance	Classification	Objective	Impact score	Data confidence Destin certainty	Deterioration between status classes	Impediments to GES/GEP Compromises water	Mitigation applied	Post mitigation impact score	Comment of the impact of 'Changes to channel footprint' on each element	Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element	Comment of the impact of 'Changes in sedimentation deposition' on each element	Comment of the impact of 'Changes to water body hydromorphology leading to changes in river process and habitats upstream and downstream' on each element	Comment of the impact of 'Change in water es quality due to new or changes to existing discharge of surface water into surface water body' on each element	Comment of the impact of 'Change in INNS present in surface water body' on each element
	Fish		Poor in 2015	Good by 2027	2	Low Lo	v Possible	Possible Poss	INNS treatment has been provided between the River Trent abstraction and the transfer to the	e 2					Changes in water quality as a result of the discharge, has the potential for impacts on fish and impacted rates already impacted by poor	
Biological quality elements									River Witham.		No effects are anticipated as a result of a channel in footprint	Changes in local velocity and flow in this waterbody may have an impact on biological quality elements, further investigation is required to	change sedimentation pattern. This could affect biological guality elements. further	sedimentation pattern. This could affect biological guality elements, further investigation would be	water quality	The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer
	Invertebrates	Guidance document available	Good in 2015	Good by 2015	1	Low Lo	v No	No N	Further water quality modelling is required to determine the extent of impacts within this catchment	1		determine this.	investigation would be required.	required.	Changes in water quality as a result of the discharge, has the potential for impacts on invertebrates	into the River Witham.
Hydromorphological Supporting Flements	Hydrological Regime		Supports Good in 2015	Supports Good by 2015	2	Low Lo	v Possible	Possible Poss	Hydraulic modelling required to understand the impact of additional flow on watercourse	2	No effects are anticipated on the hydrological regime	Changes to flow velocity and volume: hydromorphology of the channel would be changed by additional flow in channel, altering channel processes and conditions such as water depth and flow velocity	Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime.	Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime.	 No effects are anticipated on the hydrological regime 	No effects are anticipated on the hydrological regime
	Mitigation Measures Assessment		Moderate or less in 2015	Good by 2027	0	Low Lo	v No	No No	None required	0	No effects are anticipated on the mitigation measure assessment	Changes in flow velocity and volume will unlikely significantly affect the mitigation measures assessment	Potential increase in sedimentation is not expected to have a significant effect on the mitigation measures assessment	Potential increase in sedimentation is not expected to have a significant effect on the mitigation measures assessment	No effects are anticipated on the mitigation measure assessment	No effects are anticipated on the mitigation measure assessment
hysico-chemical quality elemen	Ammonia (total as N) Biochemical oxygen demand Dissolved oxygen	Numerical limits for classes	Hgh In 2015 Hgh In 2015 Hgh In 2015	Cood by 2015 No data available Cood by 2015 Cood by 2015	3		v Possible v Possible v No	Possible Poss	Further water quality modelling is required to determine the extent of impacts within this catchment	3	No measurable impact anticipated on the physics chematic sar areault in the change in channel forchmit		No measurable impact anticipated on the physico-chemoiats as a result in the change i addiment deposition	No masurable impact anticipated on the physicochemical as a result in the change in pytoromorphology	A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be an increase in ammonia of 7% due to the discharge from the River Trent into the upstream Witham (2016)20205780, Bengalantin (1) of Scheline 2, Uhi wellenbody is catagoried as a paper 7 wire for ammonia standards (ammonia concentration of ammonia standards (ammonia deterioration from high to good standards (ammonia be higher, however 1 uther investigation is required to determine the predicted %. On a proposed transfer from the River Trent to the decrease in Dissolved Oxygen of 2% due to the tokever (furtham suggests that there will be a decrease in Dissolved Oxygen of 2% due to the tokever (furtham suggests that there will be a decrease in Dissolved Oxygen of 2% due to the tokever (furtham ruspess). Within this catchment, BOI levels are expected to be lower tokever (furtham ruspess) there there will be a decrease in Dissolved Oxygen of 2% due to the proposed transfer from the River Trent to the proposed tra	s d No measurable effects anticipated as a result of changes in to the INNS on the physico-chemical elements
	pH Phosphate Temperature	Calculator available	High In 2015 Poor In 2015 High In 2015	Cood by 2015	3	Low Low	v No v Yes v No	NO N		1 3					Increase in professional and a second	
															catchment, temperature is expected to be lower however further investigation is required to determine the predicted %. On a precautionary basis a negligible impact is expected	r.
	Acid Neutralising Capacity	Numerical limits for classes	High in 2015	Good by 2015	0	Low Lo	v No	No N	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised	
	Benzo (b) and (k) fluoranthene	EQS directive	Good in 2015	Good	0	Low Lo	v No	No N	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised	
	Benzo (ghi) perelyene and indent (12	3-0 #N/A	#N/A	#N/A	0	Low Lo	v No	No No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised	
	Benzo(a)pyrene	EQS directive	Good in 2015	Good	0	Low Lo	v No	No N	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised	
Priority hazardous substances	Prominated diphered they (PDC) or	Ic EOS diractiva	Coord in 2015	Cond		Low L	u Na	No	None remained						nine line discharges No measurable effects anticipated as a result of	
	Cadmium and Its Community	EQS directive	Condin 2015	Good	0	Low Lo	NO NO	No No	None required.	0					vianges from temporary infrequent tocalised pinoline discharges No measurable effects anticipated as a result of the measurable effects anticipated as a result of	
	Manual and its compounds	EGS GREENVE	0 - 11 - 2015		0	Low	NU		None required.						nanges nom temporary intrequent tocalised pinoline discharges No measurable effects anticipated as a result of	
	Mercury and Its Compounds	EUS directive	Good in 2015	Good	0	Low Lo	No	No No	None required.	0					changes from temporary infrequent localised pipeline discharges No measurable effects anticipated as a result of	
	Nonylphenol	EQS directive	Good in 2015	Good	0	Low Lo	v No	No No	None required.	0					changes from temporary infrequent localised nine line discharges	
Specific pollutants	Triclosan		High in 2015	High	0	Low Lo	NO NO	No N	None required.	0					changes from temporary infrequent localised pipeline discharges	

Return to top of the page	2								Does the	component co WFD objective	mply with s			
RNAG/PoM/HHWMM	ld	Relevant WFD Quality Element (RNAG) / Measure category 1 (PoM)	Category (RNAG)/Lead organisation (PoM)	National Swmi Header (RNAG) / Title (PoM)	Is this measure potential impacted by the scheme? (Yes/No)	Impact score assessment	Data confidence	Design certainty	attainme nt of water body objective	Impediment to GES/GEP	Comprom ises water body objective s	Mitigation applied	Post mitigation impact score (2 to 3)	New transfer in the watercourse
Reasons for Not Achieving Goo (RNAG)	d 53318	4 Mitigation Measures Assessment	Agriculture and rural land management	Physical modifications	No									
Reasons for Not Achieving Goo (RNAG)	d 53318	6 Mitigation Measures Assessment	Local and Central Government	Physical modifications	No									
Reasons for Not Achieving Goo (RNAG)	d 53103	6 Phosphate	Water Industry	Pollution from waste water	Yes	2	Low	Low	No	Possible	Possible		2	A high level water quality review
Reasons for Not Achieving Goo (RNAG)	d 53103	4 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible	Further units modelling is consisted to	2	suggests that the new discharge into this waterbody will increase the
Reasons for Not Achieving Goo (RNAG)	d 53103	5 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible	determine the extent of impacts within this	2	phosphate concentration, potentially leading to a reduction in the
Reasons for Not Achieving Goo (RNAG)	d 48623	9 Phosphate	Urban and transport	Pollution from towns, cities and transport	Yes	2	Low	Low	No	Possible	Possible	cacciment	2	improvements that can be made to water quality. Further investigation

Reasons for Not Achieving Good (RNAG)	528607	Fish	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible	2	into water quality needed
Reasons for Not Achieving Good (RNAG)	528820	Fish	No sector responsible	Non-native invasive species	No								
Reasons for Not Achieving Good (RNAG)	528606	Fish	No sector responsible	Non-native invasive species	No								
Reasons for Not Achieving Good (RNAG)	531033	Fish	Agriculture and rural land management	Physical modifications	No								

Option	SLR 41	Go to RNAG/PoM table at bottom of the page							_								
Waterbody ID	GB205030062425									Activity					New transfer within the watercourse		
Waterbody name	Witham - conf Catchwater Drain to conf Bain									Construction, Operation or Decommissioning activ	ity	Operation	Operation	Operation	Onoration	Operation	Operation
Waterbody type	River									Potential Impacts of asset (following consideration	n of	Operation	Changes in flow velocity and volume (increase or		changes in river processes and habitats upstream and	Change in water quality due to new or changes to existing discharge of	operation
Hydromorphological designatio	n Heavily Modified	Action: Obtain HMWB measures information from the								Biological Effects		Changes to channel rootprint	decrease)	changes in sedimentation deposition	downstream	surrace water into surrace water body	change in INNS present in surface water body ✓
Overall status	Moderate	Environment Agency to add to the RivAG/Polvi table.								Hydromorphological supporting elements		~	~	v	√		1
Overall status objective	Moderate by 2015		-							Physicochemical Effects		1	x	1	1	4	4
,,,,,,,,,,,,,						Г	Does the co	nponent comply with	WFD	Chemical effects		, , , , , , , , , , , , , , , , , , ,	Y Y	, ,	×		×
							object	ives (post mitigation)	a.		pg	P.	P	F	P	·	<i></i>
WFD status Component	WFD quality element	Method of checking compliance	Classification	Objective	Impact score Data confidence	Design certainty	Deterioration betwee status classes	Impediments to GES/GEP	Compromises wate body objectives	Mitigation applied	Post mitigation impu score	Comment of the impact of 'Changes to channel footprint' on each element	Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element	Comment of the impact of 'Changes in sedimentation deposition' on each element	Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element	Comment of the impact of 'Change in water quality due to new or changes to existing discharge of surface water into surface water body' on each element	Comment of the impact of 'Change in INNS present in surface water body' on each element
Biological quality elements	Fish		Moderate in 2015	Good by 2027	1 Lov	v Low	No	No	No	INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham. Further water quality modelling is required to	1	No effects are anticipated as a result of a channel in footprint	Changes in local velocity and flow due to the transfer of water may still have an impact on biological quality elements, further investigation is required to	Changes in flow volume and velocity could change sedimentation pattern. This could affect biological quality elements, further investigation	Changes in flow volume and velocity could change hydromorphology. This could affect biological quality elements further investigation would be required	Changes in water quality as a result of the abstraction, has the potential for minor localised impacts on fish and invertebrates	The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer into the River Witham
	Invertebrates	Guidance document available	Good in 2015	Good by 2015	1 Lov	v Low	No	No	No	determine the extent of impacts within this catchment	1		determine this.	would be required.			
Hydromorphological Supportin Elements	Hydrological Regime g		Supports Good in 2015	Supports Good by 2015	2 Lov	v Low	No	No	No	Hydraulic modelling required to understand the impact of additional flow on watercourse	2	No effects are anticipated as a result of a channel in footprint	Changes to How velocity and volume: hydromorphology of the channel would be changed b additional flow in channel, altering channel processes and conditions such as water depth and flow velocity	Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime.	Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime.	No effects are anticipated on the hydrological regime	No effects are anticipated on the hydrological regime
	Mitigation Measures Assessment		Moderate or less in 2015	Good by 2027	0 Lov	v Low	No	No	No	None required	0	No effects are anticipated as a result of a channel in footprint	significantly affect the mitigation measures assessment	expected to have a significant effect on the mitigation measures assessment.	to have a significant effect on the mitigation measures assessment.	No effects are anticipated on the mitigation measure assessment	No effects are anticipated on the mitigation measure assessment
	Ammonia (total as N)		Good in 2015	Good by 2015	3 Lov	v Low P	ossible	Possible	Possible		3					A high level water quality assessment of the proposed transfer from the River Trent to the River Withma suggests that there will be an increase in animosia of 7% due to the discharge from the River Trent into the upstream Witham (Cdi 05/03006780). Within this cathment, Ammonia required to delormize the predicted %. On a precautionary basis an ambér advene Impact is expected.	
	Biochemical oxygen demand	Numerical limits for classes	High in 2015	No data available	0 Lov	v Low	No	No	No		0	_		-		In light new tensors quarity assessment of the groups of an activity of the decrease line 1000 of 2% due to the discharge from the River Trent Into the lippersam Withman (GISG00506780) Within this cathematic, BOD levels are expected to be lower, however further investigation is required to determine the predicted %. On a processitianty basis are applied impacts as expected A. highly assessment of the proposed transfer from the	
	Dissolved oxygen	Numerical limits for classes	Good in 2015	Good by 2015	0 Lov	v Low	No	No	No	5	0					River Trent to the River Witham suggests that there will be a docrease in Dissolved Oxypan of 2% due to the discharge from the River Trent into the upstream Witham (GB105030056780). Within this catchment, BOD levels are expected to be lower, however further investigation is required to determine the precided %. On a precautionary basis a negligible impact is expected.	
Physico-chemical quality elemen	nt pH		High in 2015	Good by 2015	1 Lov	v Low	No	No	No	Further water quarty modelling is required to determine the extent of impacts within this catchment	1	No effects are antilopated on the physico-chemicals as a result of a channel in footprint		No effects are anticipated on the physico- chemicals as a result of a changes to the hydromorphology	ivo measutable impact anticipated on the physico- chemicals as arsus li ti the change in hydromorphology	A high level water quality assessment of the proposed transfer from the beer Trent to be fore: Withow augusts that there will be an increase in pHo f 4% due to the discharge from the River Trent into the upstream Mitham (GB 165006598). Within this schement, pH levels are expected to be lower, however further investigation is required to determine the predicted %. On a precautionary basis a minor localised impact is expected.	no measurative effects anticipated as a result of changes in to the NNS on the physico-chemical elements
	Phosphate	Calculator available	Moderate in 2015	Moderate by 2015	3 Lov	v Low	Yes	Yes	Yes		3			_		A high level water quality assessment of the proposed transfer from the keep level water quality assessment of the proposed transfer loop the in phosphate of 46% due to the discharge from the Biver Trent into the quartaram Witham (dis 0050005696%) within this cathema. Phosphate levels are expected to be lower, however further investigation is required to delimine the predicted N. On a preclutionary basis a major advense impact is expected.	
	Temperature	Numerical limits for classes	High in 2015	Good by 2015	1 Lov	v Low	No	No	No		1					A high level water quality assessment of the proposed transfer from the fover Trent to the Newr Witham suggests that three will be an increase in temprature of 1% due to the discharge from the River Trent into the upstram Witham (dis 050005678) within this cathement, temporature is expected to be lower, however further investigation is negligible impact is expected.	
	Acid Neutralising Capacity	Numerical limits for classes	High in 2015	Good by 2015	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Benzo (b) and (k) fluoranthene	EOS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Benzo (ghi) perelyene and indeno (123-cd) pyrene	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Benzo(a)pyrene	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Brominated diphenylether (BDPE) Calc	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
Priority hazardous substances	Cadmium and Its Compounds	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Endosulfan	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Hexachlorocyclohexane	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised intelline discharges	
	Mercury and Its Compounds	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised intelline discharges	
	Nonylphenol	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised nineline discharges	
Priority substances	Nickel and Its Compounds	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges	
	Chlorothalonil		High in 2015	High	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrement localised pipeline discharges	
	Copper		High in 2015	High	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infraguent localized minutes findness.	
Specific pollutants	Mecoprop		High in 2015	High	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from tomocray infrauent location distributed as a result of changes from	
	Pendimethalin		High in 2015	High	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from	
Other chemicals	Aldrin, Dieldrin, Endrin & Isodrin	EQS directive	Good in 2015	Good	0 Lov	v Low	No	No	No	None required.	0					No measurable effects anticipated as a result of changes from temporary infrequent localised minuting discharges	
																camporary introductivitoralised pipeline discharges	

Return to top of the page									Does	the component comply will objectives	h WFD				
RNAG/PoM/HHWMM	ld	Relevant WFD Quality Element (RNAG) / Measure category 1 (PoM)	Category (RNAG)/Lead organisation (PoM)	National Swmi Header (RNAG) / Title (PoM)	Is this measure potential impacted by the scheme? (Yes/No)	Impact score assessment	Data confide nce	Design certainty	attainme nt of water body objective	Impediment to GES/GEP	Comprom ises water body objective s	Mitigation applied	Post mitigati impact s 2 to 3)	ion score (-	New transfer within the watercourse
Reasons for Not Achieving Good (RNAG)	51784	3 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible		2	2	A high level water quality review
Reasons for Not Achieving Good (RNAG)	52920	7 Phosphate	No sector responsible		Yes	2	Low	Low	No	Possible	Possible	Further water quality modelling is required to	2	2	suggests that the new discharge into this waterbody will increase the phosphate concentration,
Reasons for Not Achieving Good (RNAG)	51784	5 Phosphate	Agriculture and rural land management	Pollution from rural areas	Yes	2	Low	Low	No	Possible	Possible	due to the transfer within this catchment	2	2	the improvements that can be made to water quality. Further
Reasons for Not Achieving Good (RNAG)	48184	4 Phosphate	Water Industry	Pollution from waste water	Yes	2	Low	Low	No	Possible	Possible		2	2	needed

Reasons for Not Achieving Good								
(RNAG) 530	485 Fish	No sector responsible	Non-native invasive species	No				
Reasons for Not Achieving Good								
(RNAG) 530	486 Fish	Other	Physical modifications	No				
Reasons for Not Achieving Good								
(RNAG) 520	881 Fish	Agriculture and rural land management	Physical modifications	No				

Dation.	16R 41		to to REACTED TIME at LOTION of the same	٦										Add the pipelines into this one															
Wate-Body ID	GB2050	30062426		-					Activity.		1	New or increased surface water abstract	San	i.				New transfer within the watercourse	ir.	1		the	rttenance of pipe lines. Sincluding drains	ng pipetine)		New	ipe lines involving watercourse stocking	with to in channel modifications.	· · · · · · · · · · · · · · · · · · ·
statebody name	Lower V	/itham - conf Bain to Grand Sluice							Construction, diperation or becommissioning activity	Operation	Operation	Specifice	Operation	Operation	Operation	Operation	Operation	Operation	dpeation	Operation	bperation .	Operation	Operation	Operation	Operation	Construction and operation	Construction	Construction	Construction
Watebody type	li wr								Potential Impacts of asset (following consideration of embed mitigation)	Changes to channel footprint	(hange in flow wincity and volume (increase or decrease)	Changes in addimentation-deposition	drange in name body repairinophology maning in dranges in river processes and habitats upstream and downstream	Change in water quality due to new or changes to existing deschage of surface water into surface water body.	Changes to channel footprint	Changes in flow-velocity and volume (increase or decrease)	Change in sudmentation deposition	to changes in niver processes and habitats openant and downstream	Change in water quality due to new or changes to existing discharge of writke water into surface water body.	Charge in 1995 present in surface-water body	Changes in flow velocity and volume (increase or decrease)	Charge in undimentation deposition	Noise and vibration	widing discharge of surface water into surface body	and Change in Militigeneers in surface water body	changes in river processes and habitats up channy of down-channes	Changes in flow velocity and volume (nonsee or docraes)	Changes in sudimentation deposition	Noise and vibration
Hydomoshological de	vignation Readly Mod	fiel	Action: Obtain: Multill measure information from the Environment Ages to add to the Hold/Post table.	9					Rotogical Block	~	~	×	4	×	4	4	4	×	4	×	1	1	4	×	×	×	4	4	· ·
Overall status	Maderate								eydomoshological supporting elements	~	1	1	1	~	4	~	~	~	~	×	1	×	×	×	x	×	1	1	·
Ownall status objective	Madwate by	2015							Physicochemical Sthem	~	x	~	1	~	~	*	~	~	1	*	1	~	~	~		×	*	×	*
							Opes the car	nponent.comply with WFD objectives mitigation)	pera Den kal effects	x	×	×	×	4	*	*	8	×	4	*	×	×	×	~	x	×	*	×	*
							te para	C6-CE		1								Comment of the impact of "Changes to water boo						Comment of the impact of "Change in water or	en.				í
BFD status Component	WD quality	ianat	Method of chedding compliance	Constitution	Objective	pat so	iprorfa caller b tis theo	ar the fe	Mitigation applied	S S Comment of the impact of 'Change.	Se Comment of the impact of 'Changes in flow wiscity and volume (increase decrease)' on wath element	or Comment of the impact of 1Changes in administration deposition" on each element	Comment of the impact of "Changes to water body hydromorphology leading to changes in niver processe and habitats upsthem and downstream" on each view	Comment of the impact of "change in water quality due to n changes to minimigidiocharge of surface water into surface water wett body" on each viewent	the of Comment of the impact of 'Change than in footprint' on each element	Sommer of the impact of "changes in flow wiscity and volume (increase or decrease)" on each demost.	Comment of the impact of 'Changes in redimentation deposition' on each element	hydomorphology leading to changes in river processor and habitatt upstham and downstream	comment of the impact of "Change's water quality due to new or change to existing discharge of ourface water into surface water body' on each deniest	⁶⁶ Comment of the impact of 'Change in INNCi press in surface water body' on each element.	Comment of the impact of "changes in flow velocit and solume (increase or decrease)" on each visioned	Comment of the impact of "Changes in ordimentation deposition" on each element	Comment of the impact of 'Noise and elaration' on each element	due to new or change to existing discharge of surface water into surface water body on each	Comment of the impact of 'Charge in NNS provert in surface water body' on each element	Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element	Comment of the impact of "Changes in flow wilocity and volume (increase or bicrease) on each element	Comment of the impact of 'Changel in Gelimentation deposition' on each dement	Comment of the impact of Noise and vibration" on each element
						* 9	2 International Contraction	Lenges (Pat n								on each element						domatt					1
											Changes in flow and velocity caused by the new abstraction may have impo																		
Relogical quality	alements Investigates		Suidance document available	Good in 2015	faod by 2015	2 1.04	w Low Posible	Pocible Poc	Mich teatment has been provided between the kiver limit abstraction and the transfer to the kiver limits.	time abstraction anticipated to have similarid footprint, minimal effect on	outfall / discharge into the River Mitham and it is assumed that it will asstant the care - are ount of water as is discharged upstream. Despite this	thange sadmentation pattern, between the Bischarge and abstraction and downsteam of t	order eration pattern, between the discharge and destaction and downstream of the abstraction. This co	auto the solution in water quality as a music of the abstraction, has the	an anticipated as a result of a chan	Changes in local velocity and flow between the discharge and abstraction may still have an impact of its to biological austraction may still have an impact	change ordere estation pattern, between the discharge and abstraction and downstream	e dange hydranophology between the discharge in of the and abstraction and downstream of the	changes in water quality as a result of the abstraction, has the potential to show to show to see the second	the water sourced from the liner liner and will be tracked for IPASI to ensure no IPASI bandwrinto th	Importy intropent location changes to flow	imporary infrequent locations changes to flow unlikely to effect extrementation and expected to have minimal effect on	femporary introquent location noise unlikely to effect for as they will more	Importery introquent locations changes to wate	pipeline maintenance could lead to etcoduction of ROVE as pipeline would	No mesuable thest anticipated as a result of change. In the hydomorphology on the biological quality denoming Al this shop his assumed construction.	acalised changes to flow whichly round intake repected to have triteintal	result of new intelle-could lead to localised changes in sediment deposition	Potential temporary distuituance during construction, though investments
									determine the accent of impacts within this catchment	biotogical quality elements	supporting flow, changes in tocal velocity and flow-between the discharge and abstraction may still have an impact on biology, but to an uncertain where further investments is serviced.	detraction. This could affect biological quality instants, further investigation would be require	discribiological quality elements, further investigation and social beinquind.			is required to determine this.	detraction. This could affect biological el further investigation would be required.	where a could affect biological quality where the second affect b		low Wittan.		tica	away from the source of the indice		tontain two water form another waterbod See these assessment for more details.	nethads will complise of tenchines activies.	dist on investigation	which is anticipated to have minimize effect on the biological elements	entitiety to be service to impact
																				_									
									tis assured bet packs design will be instrumented for		Vinor localised impacts an example on the hydrological maine due to the	Formula increased undimensation due to	Potential increased sadimentation due to abstraction in	nat		Changes to flow velocity and volumes hydromorphology of the channel would be	Potential increase in sedimentation is not	s Patential increase in sedimentation is not								No meanwable effects anticipated as a result of changes.	to measurable effects anticipated as a result of changes in flow woody and	No measuable effects anticipated as a result of changes in sedimentation on the	(
	нувтолодия	ingino -		supports faxed in 2015	Supports Good by 2015	2 534	w Low Posible	Possible Poss	the induction further investigation is required to determine the assess of impacts.	2 effects on the hydrological ingine.	things in flow velocity and volume rates as a result of the abstraction (assumed to be countrativationed by the discharge in waterbody up cream).	doctaction not expected to have significant effe on the hydrological regime	az apocted to have significant effect on the hydrological legime	to measuble impact anticipated on the hydrological eight	ee an anticipand as a result of a chan	If an optimum mash and the abstraction, attering channels optimum mash and the abstraction, attering channel becomes and conditions such as water depth and	reported to have a significant effect on the hydrological regime.	e expected to have a significant effect on the hydrological regime.	to effects are anticipated on the hydrological regime	No effects are anticipated on the hydrological logitie	temporary intropent distrarge are antropand to have minimal effects on the hydrological regime					In hydromospheragy on the hydrological regime. At this, stage it is assumed construction methods will comprise of transitions, activities.	this stage it is assumed construction reflock will complete of tenchios	hydrological regime. At this stage it is assumed construction methods will	to in would in inpact an orpade on the hydrological inginio
Hydonophoopo Eenen	i supporting															fee whicity											estries.	conpete d' bischikt killer.	(
									t is assumed best pactor design will be implemented for	Minor localised impacts are anticipant, due to the indee structure	Changes in flow and whochy united to clarificately after obvicat	Potential increased undimentation due to	Potential increased audimentation due to abstraction in	not. No mesuable impact anticipated on the millipation measure		Changes in flow-velocity and volume will unlikely	Potential increase in sedimentation is not	E Parandial increase in ordimentation is not		No effect, are anticipated on the triblation measure						No measuable-iffects anticipated as a result of change. In their original states the triblation measures.	Changes in flow and welcosty unlikely to	Potential increased exclamentation due to	to mesuphir inpact articizand on th
	Unit gation for	sacaria. Acoscolinari		situaticale or sec so 2015	1000 By 2027	1 1	e Los No		the strate churches of the head chap, the minipation the assume assessment will head to be requected.	increasing the physical modification pressure.	nodifications presare	an mitigation maximum	all sepond to have significant effect on mitigation researchers.	unit, autoritation	an anticipated as a result of a chain	as an experimentary affect the mitigation measures.	reported to have a operation what on the intrigation measures accessment.	 epacid to have a cignitized effect on the initigation measure accessed. 	to encla an anticipated on the mitigation measure associated	aunan we						executions. At this stage it is assumed construction methods will complete of tenchines activies.	egencanty and physical readifications pressure	aperation not repetite to have agnificant effect on to lightion measures.	hitigation measures associated
	Anmonia bo	54 H N		land in 2015	field by 2015	1 100	w Low Possible	Posible Pos											A high twel water quality accessents of the proposed transfer from the in functs the lower Witham suggest that there will be an increase in anne o of 7% due to the discharge from the lower first into the up stream Witham										í .
																			(Brolioboolie740) Further invedigation is required to determine the impact. On a precautionary basis an amber adverse impact is repeated.										(
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	Bochanica	seggen domand	Numerical limits for classes.	нар и 2011	No data available	0 134	w Low No	No N		•									Institu the Row Without suggests that there will be a decrease in Discolv former of the Assets the Row New York West Front Sec. But we have										(
																			A high level water quality accesses and of the proposed transfer from the lit literate the literar Witham suggests that there will be a decrease in BOD of 19, doe to the decrease from the literar literations. Recent them Witham										(
	dissolved av	19m	Numerical line its for classes	Good in 2015	Good by 2015	• •	w Low No	NS N		•									(anti-doots) within this calchment, BOD levels are expected to b ower, however further investigation is required to determine the predicted	2									(
																			 On a precadorary back an egligible impact is expected. 			To rescuble this articlastic a a							(
Physics-chemical qu	ality alars area								Further water quality modelling is required to determine the extent of impacts within this catchever	effects on the physical chemical effects on the physical chemical electronics		No measuble-inks: anti-galed as a result of charges in the sadimentation deposition on the sthesas-chemicals.	to neurable-effect anticipated at a result of change the hydramophology on the phyloco-chemicals	es in blear effects anticipand as a result of abstraction on the ph : demicals	chemicals as arecipate on the pri- chemicals as a result of a channel factories	1000 10	too ittics, are anticipated on the physica- chemicals; as a mouth of a changes to the redimentation	 Its ittes, an anti-patiel on the physica- chemicals as a multion a change to the hydomorphology 	Institut the RiverWitham suggests that they will be an increase in prior due to the docharge from the River Trent into the upstman Witham	a	the measurable effects articipated as a recent of changes in flow and wilcolty on the physico- chemical elements	result of changes in sedimentation deposition on the physics chemical	No measurements analysis a result of change in noise and vibrat on the physics-chanical element	 No insulation effect anticipated at a leval on change in water quality on the physico-chen elements. 	of No measurable-effects anticipated as a call insult of changes in water quality on the objects character isal elements.	•			í .
	~			np = 2011	1000 B) 2010														(Brokobobia/90), Within this catchment, pH levels are expected to be been, however further investigation is required to determine the predicted			anananz							í .
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																			Institution want gaar gaar gaar and the propose a strong out of the Institution Row Without suggests that there will be an increase in phosphate of balls due to the discharge from the Row Tent into the										(
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	Temperatum		Numerical limits for classes	нар ін 2016	food by 2015	1 500	w 100 No	N2 N	•										Response of 1% due to the dechage tonit the Row first into the aproxem Witham (CR10)2006-190), Within this cather enr, temperate is equicate to be forwir, however further investigation is required to	<mark></mark>									(
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	beas (ph) p	entyme and indeno (123 cd) pyrme	EDS directive	Good in 2015	faod	0 1.00	w Low No	No N	•	0																			í
Priority hazardous	adotteces	14	RCS dimotrie	food in 2015	field	0 120	e Los No	No N	·	0																			
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	latimo	hate	Eci dimitive	faced in 2015	feed		a 100 T			0					-														
	Non-			40 in 2011	10		a 100 T			0																			
	Copper			Nap in 2011	1.0	0 10	w 100 NO	50 N		0																			
Specific pain	ten.			Nap in 2011	tip.		w 100 No	50 N		0																			
	Manganese			4ga in 2015	Hp	0 100	w Low No.	No N		•																			
	žec			14.pt in 2015	Ha	0 140	w 1.0w No.	No N		0																			
	Kidno, Dieka	in, Endin & Hadrin	\$25 dimitive	faced in 2015	fand	0 1.00	w 1.0w No.	No N		0																			
Other cham	cas Cabos Tetac	Norde	\$25 dimitive	faced in 2015	fand	0 1.00	w 1.0w No.	No N		0																			
	listics thy	tana	ECS directive	faod in 2015	field	0 1.00	w Low No.	No N	•	0																			
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RXAC/FCALMERATA	•	Resevent MID Quality General (RMAQ / Measure category 1 (Fold)	Category (BMQ/L+ad organization (HM)	National Sami Header (RNRQ / Title (PoM)	Is this measure potential impacted by the scheme? (NK/No)	Ingel 1004 Bostorell	Data coefficien o	Dealine of the states	Asside attainment of water Gody Objectives	Reposition to GEVERP	Companyi os water Gody Objectivos	Attegation applied	Post mitigation impact score (-2 to 3)	New Tanchr within the water.courts
Reasons for Not Achieving Good (RNAC)	617958	Phosphan	Agriculture and rural land management	Follution from rural array	WK.	2	Law	Low	80	Possible	Possible		2	A high lovel water quality miner suggests that the new discharge into
Issuant. for Not Achieving Good (INAC)	\$17906	Phosphane	lities industry	Failution from water within	TH.	2	Law.	Low	80	Pocifile	Possible	Further water quality in additing it required to determine the outers of impacts within this catchment	2	this waterbody will increase the phosphate-concentration, potentially leading to a reduction in the improvements that can be made to
Enancers for Not Achieving Good	(a bina				Yes.	2	Law	Low	No	Possible	Pecchia		2	water quality. Further investigation in water quality needed

WFD standards for Phosphorous standard in rivers:

Table 5

Phosphorus S	itandards in Rivers ⁽ⁱ⁾
Annual mean	reactive phosphorus concentration (in µg per litre) is calculated as follows:
High	10 to the power of $((1.0497 \text{ x } \log_{10}(0.702)+1.066) \text{ x } (\log_{10}(\text{RP}_{ref}) - \log_{10}(3,500)) + \log_{10}(3,500))$
Good	10 to the power of $((1.0497 \text{ x } \log_{10}(0.532)+1.066) \text{ x } (\log_{10}(\text{RP}_{ref}) - \log_{10}(3,500)) + \log_{10}(3,500))$
Moderate	10 to the power of $((1.0497 \text{ x } \log_{10}(0.356)+1.066) \text{ x } (\log_{10}(\text{RP}_{ref}) - \log_{10}(3,500)) + \log_{10}(3,500))$
Poor	10 to the power of $((1.0497 \text{ x } \log_{10}(0.166)+1.066) \text{ x } (\log_{10}(\text{RP}_{ref}) - \log_{10}(3,500)) + \log_{10}(3,500))$

⁽ⁱ⁾In this table, "Reactive phosphorus concentration" means the concentration of phosphorus as determined using the phosphomolybdenum blue colorimetric method. Where necessary to ensure the accuracy of the method, samples are recommended to be filtered using a filter not smaller than 0.45 μm pore size to remove gross particulate matter.

"RPref" represents the annual mean concentration of reactive phosphorus in $\mu g/l$ estimated for the site under reference conditions using the equation: 10 to the power of (0.454 (log₁₀Alkalinity) – 0.0018 (Altitude) + 0.476). If the value calculated for RPref using the equation above is less than 7 $\mu g/l$, it must be substituted for the purposes of calculating the standards for phosphorus by a value of 7 $\mu g/l$. For the purposes of calculating RPref:

(i) "Alkalinity" is the concentration of CaCO3 in mg/l. If a site has an alkalinity greater than 250 mg/l CaCO3, a value for alkalinity of 250 must be used for the purposes of calculating RPref. If a site has an alkalinity of less than 2, a value for alkalinity of 2 must be used for the purposes of calculating RPref.
(ii) "Altitude" means the site's altitude above mean sea level in metres. If a site has an altitude of greater than 355 metres, a value for altitude of 355 metres must be used for the purposes of calculating RPref.

Calculations:

Atomic weight	
Phosphorus	31
Atomic weight	
orthophosphate	95

Alkalinity @		
Claypole		
(average)	208	mg/I CaCO3
Altitude	15	mAOD
Rpref	31.72494	ug/l

WFD phosphorous standards for the River Witham (based on table 5):

High	50	ug/l
Good	90	ug/l
Moderate	213	ug/l
Dana	1004	
Poor	1094	ug/I
Current status o	on catchme	nt data

explorer for River Witham is Moderate

Estimated changes in phosphate / phosphorus concentration due to proposed transfer:

Orthophosphato	concontrat	ion	Phosphorus		Standards as per calculations from table 5
basolino P			CONCENTRATION		
Witham					
(average)	256	ug/l		83.5	Good/Moderate
baseline R					
Witham (max)	521			170.0	Moderate
Baseline R Trent					
(average)	389	ug/l		126.9	Moderate
Baseline R Trent					
(max)	1020			332.8	Poor

% of Sour	ce Water
Witham	8%
Trent	92%

			Potential phosphorus concentration at	Standards as per
Potential orthoph	osphate co	oncentration at	River Witham with	calculations from
River Witham with	h discharge	e from Trent	discharge from Trent	table 5
average conc	378.36	ug/l	123.5	Moderate
max conc	980.08	ug/l	319.8	Poor

Therefore, potential for deterioration in River Witham from good/moderate to moderate/poor

¹⁸

WFD standard for Ammonia:

Table 7

Ammonia stan of Schedule 2)	dards for rivers	(rivers categorised	by type in accordanc	e with paragraph 1(1)
Total Ammonia	as nitrogen (mg/	7)		
(90 percentile)	1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 -	29. 193	32	32
Туре	High	Good	Moderate	Poor
1, 2, 4 and 6	0.2	0.3	0.75	1.1
3, 5 and 7	0.3	0.6	1.1	2.5

Table 1

Criteria for ident demand and amr	ifying the types nonia standard	s of river to wh s for rivers ap	ich the dissolve ply	d oxygen, bioche	mical oxygen	
Site Altitude	Alkalinity (as mg/1 CaCO3)					
	Less than 10	≥10 to <50	≥50 to <100	≥100 to <200	Over 200	
Under 80 metres	Type 1	Type 2	Type 3	Type 5	Type 7	
Over 80 metres		a second a second as	Type 4	Type 6		

River Witham is at 17mAOD with an average alkalinity of 208mg/l therefore would be a type 7 river

WFD ammonia standards for the River Witham (based on table 7):

High	0.3	mg/I as N
Good	0.6	mg/I as N
Moderate	1.1	mg/I as N
Poor	2.5	mg/I as N

Estimated changes in ammonia concentration due to proposed transfer:

90%ile			Standards as per calculations from table
			7
baseline R Witham (average)	0.06	mg/I as N	High
baseline R Witham (90%ile)	0.09	mg/I as N	High
Baseline R Trent (average)	0.184	mg/I as N	High
Baseline R Trent (90%ile)	0.32	mg/l as N	Good

Potential ammonia concentrat discharge from Trent	ion at Witha	m with	Standards as per calculations from table 7
90%ile conc	0.3016	ug/l	Good

Therefore, potential for deterioration in River Witham from high to good

