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Date: 6th October 2023

Your ref: APP/W0530/W/23/3315611

LPA ref: 22/02771/OUT

By email: Alison.Dyson@planninginspectorate.gov.uk

Dear Alison

Town and Country Planning Act 1990
Appeal by Brookgate Land Limited on behalf of the Chesterton Partnership
Site address: Land to the north of Cambridge North Station, Cambridge, CB4 OAE

Environment Agency Review of Cambridge Water Company Scenario Modelling to inform the Brookgate Planning Inquiry Ref. APP/W0530/W/23/3315611

1. Executive Summary

The Cambridge Water Company (CWC) scenario modelling work has not materially changed the Environment Agency's position that there is an unacceptable level of risk of environmental deterioration from the combined level of abstraction CWC forecasts it needs for existing and new customers, including the appellant's development up until 2032.

The views presented in this written representation are without prejudice to alternative opinions being formed subsequently following a more comprehensive assessment and may change further to the Environment Agency's review of CWC's revised draft Water Resources Management Plan 2024.

2. Summary of findings

The results of Cambridge Water Company's (CWC) growth scenario modelling reaffirm the Environment Agency's previous conclusions from the evidence provided for the Public Inquiry¹. The outputs conclude that there are surface water bodies where there is a 'medium'

¹ [cd1301-ea-appendix-1-baseline-data-of-risk-of-deterioration-to-water-bodies-from-water-abstraction.pdf](#) (scambs.gov.uk)

or 'high' risk of deterioration associated with the level of abstraction CWC is required to make to meet the demands of existing customers, and projected growth, including the appellant's development, until the Grafham transfer option is available.

The modelling concludes that even with no new development, the associated increased demands for abstraction (above the licence cap level) result in a 'medium' deterioration risk for one surface water body (SWB) - the River Granta, which is a material consideration in this case. With planned growth projections introduced, the risk increases significantly concluding that there is a 'medium' to 'high' risk of deterioration for six SWBs until 2032 when the Grafham Reservoir transfer is due to be operational.

The licence caps introduced by the Environment Agency are a measure introduced to manage the risk of abstraction causing a deterioration of the water environment. It should be noted that these caps are not intended to deliver improvements to waterbodies, to achieve this would require further reductions beyond the licence caps being introduced. Many environmental improvements linked to reducing abstraction licence quantities are not forecast to be possible until after the Fens Reservoir is delivered in 2036, in combination with the long-term environmental ambition.

It should be noted that waterbody deterioration is measured relative to the starting conditions, which for some SWBs means that the flows do not presently meet the hydrological flow targets that support Good Ecological Status. Therefore 'low' or 'no' deterioration risk does not automatically mean that there are no current flow/abstraction related pressures on the SWBs, just that there is forecast to be no/low risk of these getting worse (deteriorating).

The work completed by CWC has refined the envelope of deterioration risk by providing a more realistic future abstraction scenario than was available for the Public Inquiry. However, the Environment Agency must urge caution in their caveat that the limited time/resource available to undertake a comprehensive analysis of this abstraction scenario and the modelling work means this is a judgment based on best available information not a conclusive assessment.

The deterioration risk assessment is separate to the consideration of CWC's ability to supply existing and future customers without going into deficit within its Water Resources Management Plan. The work has highlighted the potential deficits in the balance of supplies and demands until new strategic resources are available. The implications for this and the use of customer drought restrictions to correct the deficits is something that the Environment Agency will be picking up through its statutory review of the revised draft WRMP published by the company on Friday 29th September 2023. The Environment Agency remains of the view that **CWC's WRMP24 is a material consideration in this case** (emphasis added).

3. Purpose and scope of growth scenario modelling

The original scope of this work was to help inform Greater Cambridge Shared Planning's (GCP) cumulative assessment of growth in its local plan. Its purpose was to provide an assessment of the impact of the appellant's development, in combination with wider planned

growth, in abstraction levels needed to supply new overall demands and the consequent deterioration risk for rivers that include chalk streams. In order to do this, GCP required information from CWC about how much water supply is available up to the no deterioration capped level, so that as the Planning Authority they could conclude how much growth can be sustainably supplied until alternative supplies can be secured. If sustainable supplies don't meet the planned levels of growth, then the work would help GCP identify what and where mitigation measures could be undertaken to reduce the risks of deterioration and meet its duty to have regard to the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017². The work has also allowed CWC to present a more realistic picture of the level of abstraction that it forecasts needing to maintain customer supplies (current and growth), and how effective its package of demand management measures in its draft Water Resources Management Plan will be. It should be noted that CWC are wholly reliant on demand management measures as their mechanism to increase water available to supply growth until the Grafham Reservoir transfer, due in 2032.

A key consideration of the Inquiry and the Environment Agency's concerns has been to have robust evidence on the level of deterioration risk which exists at the proposed level of abstraction, up to the point of new supplies being available (i.e. the Grafham Reservoir transfer in 2032). To achieve this the Environment Agency recommended that CWC used a deterioration risk screening method, which was based on its 2018 no deterioration investigation guidance to water companies. This involves creating a realistic future predicted abstraction scenario for **all CWC sources** (emphasis added) which would be required to meet the planned level of customer growth (including new customers in new developments) and running that level of abstraction through the Environment Agency's groundwater model to determine the resultant flows in surface water bodies (rivers). The change in flow from this level of abstraction could be compared to the level of flow that sets the no deterioration baseline – it is this which enables an assessment to be made of the risk of deterioration. More detail on the risk screening method can be found in Appendix 1. The Environment Agency consider that this evidence also allows CWC and GCP to assess the situation from the cumulative effects of CWC and 3rd party abstraction, to give an overall assessment of the risks.

The Environment Agency recommended to CWC that they discuss the output of its work with GCP before the report was issued, with a view to ensuring that it met GCP's needs for its own cumulative assessment of growth.

4. Environment Agency technical review of CWC's scenario modelling work

It should be noted that the Environment Agency's assessment is based on a high-level review of the outputs in the time available attributed to CWC's delayed and piecemeal provision of modelled outputs. The approach factors in the transparency of data, assumptions in the scenario modelling work and Environment Agency Technical Specialist availability. As a result, the views presented in this representation are without prejudice to

² Specifically, regulation 33, which states public bodies in exercising their functions so far as affecting a river basin district must have regard to the river basin management plan for the district.

alternative or revised opinions being formed subsequently, further to a more comprehensive assessment of this evidence and may change further following the review of CWC's revised draft Water Resources Management Plan 2024.

4a. Scenario Overview

The Environment Agency have focused their assessment on the 'WRMP2030 (S27)' scenario. It is considered that this scenario is the best available representation of forecast levels of abstraction by CWC and assumes 100% delivery and success of its planned demand management measures. It also makes assumptions about 3rd party water companies and other sectors' abstraction at the 2030 timestep.

Scenario 'WRMP2030 (S28)' is the same as S27, except the success of CWC's planned demand management measures is reduced by 50%.

Scenario 'WRMP2036 (S29)' represents the forecast level of abstraction by CWC subject to the delivery of the Grafham transfer in 2032. The date of 2036 appears in the table because when the scenario modelling was originally scoped, there was high uncertainty that the Grafham transfer was feasible, so CWC was advised to look at the timestep of the next available supply option, the Fens Reservoir in 2036. The levels of abstraction in S29 are however forecast to be in place by 2032, post Grafham transfer.

The other key scenario is 'S05 NDB_AWC' (labelled 'NDB 2 (S05)' in Table 1) – this scenario represents the baseline level of abstraction and therefore, hydrological influence of abstraction on river flows that sets the benchmark for assessing deterioration risk against.

4b. Scenario Assessment

Table 1 below shows the level of abstraction per CWC licence for each scenario. Comparing these to the no deterioration baseline (S05) enables an assessment of whether CWC is abstracting above or below the capped level. The red shaded cells indicate that abstraction is above the capped level. Details of all the scenarios are included in Appendix 2

CWC growth scenario modelling - Abstraction rates (ML/d)											
Name	Lic Number/ID	NDB 2 (S05) 10-15 AVG	WRMP 2030 (S27)	WRMP 2030 50% (S28)	WRMP 2036 (S29)	Current (S30)	WRMP 2030 peak (S31)	WRMP 2030 50% peak (S32)	WRMP 2036 peak (S33)	Current peak (S34)	All Peak (S35)
Abington Pk	6/33/28/*G/0050	0.60	1.00	1.00	0.60	0.75	1.00	1.00	0.60	0.75	1.00
Babraham	6/33/28/*G/0007	6.36	7.17	7.17	4.45	6.12	7.17	7.17	4.45	6.12	8.34
Brettenham	6/33/44/*G/0221	8.43	8.44	8.44	8.44	8.95	8.44	8.44	8.44	8.95	11.75
Croydon	6/33/30/*G/0027	0.67	1.40	1.40	1.40	0.00	1.40	1.40	1.40	0.00	1.40
Dullingham	6/33/34/*G/0203	1.65	3.60	3.60	1.65	1.93	3.60	3.60	1.65	1.93	3.23
Duxford Air	6/33/30/*G/0167	2.25	4.56	4.56	2.25	3.83	4.56	4.56	2.25	3.83	4.45
Duxford Grange	6/33/30/*G/0191	3.09	2.81	2.81	3.09	2.73	2.81	2.81	3.09	2.73	3.41
Euston	6/33/42/*G/0107	4.17	6.00	6.00	4.17	6.94	6.00	6.00	4.17	6.94	7.80
Fleam Dyke	6/33/34/*G/0024	9.74	9.70	10.60	9.74	12.18	9.70	10.60	9.74	12.18	14.33
Fowlmere	6/33/30/*G/0026	3.24	3.25	3.40	3.25	2.91	3.25	3.40	3.25	2.91	3.60
Fulbourn	6/33/34/*G/0179	1.05	1.30	1.30	1.30	1.22	1.30	1.30	1.30	1.22	1.34
Gt Chishill	6/33/30/*G/0192	1.30	1.00	1.00	1.30	0.59	1.00	1.00	1.30	0.59	1.15
Gt Wilbraham	6/33/34/*G/0123	4.08	5.60	5.60	4.08	4.87	5.60	5.60	4.08	4.87	5.19
Heydon	6/33/30/*G/0169	0.97	0.97	0.97	0.97	0.76	0.97	0.97	0.97	0.76	1.09
Hinxton Grange	6/33/27/*G/0039	5.49	5.40	5.40	5.23	5.14	5.40	5.40	5.23	5.14	5.77
Horseheath	6/33/28/*G/0052	0.27	0.87	1.60	0.87	1.32	0.87	1.60	0.87	1.32	0.87
Kingston	6/33/32/*G/0020	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
Linton	6/33/28/*G/0012	1.22	0.00	0.00	1.48	0.89	0.00	0.00	1.48	0.89	1.48
Lordsbridge	6/33/32/*G/0008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lowerfield	6/33/30/*G/0193	3.09	3.40	3.40	3.09	3.08	3.40	3.40	3.09	3.08	3.38
Melbourn	6/33/30/*G/0156	6.10	6.11	7.00	6.11	5.88	6.11	7.00	6.11	5.88	7.34
Morden Grange	6/33/30/*G/0171	0.95	0.95	0.95	0.95	1.07	0.95	0.95	0.95	1.07	1.51
Rivey	6/33/28/*G/0051	1.44	1.00	1.00	2.01	1.27	1.00	1.00	2.01	1.27	2.01
Sawston	6/33/28/*G/0038	0.97	1.20	1.49	0.98	1.20	1.20	1.49	0.98	1.20	1.49
Westley	6/33/34/*G/0110	7.31	10.60	10.60	7.31	6.91	10.60	10.60	7.31	6.91	7.92
Weston Colville	6/33/34/*G/0179 / 22506 / W-	2.23	3.00	3.00	1.98	2.58	3.00	3.00	1.98	2.58	2.83
CW total		77.03	89.33	92.29	76.70	83.12	89.33	92.29	76.70	83.12	103.61

Table 1 – CWC abstraction rates per modelling scenario

4c. Licence Caps

CWC presently has obligations to deliver licence caps to most of its licences by 31 March 2030. This is set out in the company's Water Industry National Environment Programme for Asset Management Plan (AMP) period 8 (2025-30), which informs the company's dWRMP2024. There are also some licences where changes are likely to be required before 2030, either linked to time limited licence renewals or early AMP periods. These earlier licence changes are still under discussion with CWC and are not reflected in the modelling results.

It is important to note that while the licence caps do not come into force until 2030, abstraction levels would exceed the capped levels before this date, and in some cases, they are being exceeded already. This means the deterioration risk is immediate.

4d. Conclusions

The growth scenario work evidences that CWC will not be in a position to reduce abstraction to the licence cap level until after the Grafham transfer supply option is delivered, presently forecast for 2032. Prior to 2032, the work also identifies that the majority of CWC's sources will need to abstract above the capped level to maintain forecast customer demands, including those of the appellant's development. Total CWC abstraction is forecast to increase by 6.12 Ml/d over present day levels and 12.3 Ml/d above the combined capped level by 2030.

The scenario modelling has also enabled the identification of those SWBs with the greatest risk of deterioration ('Medium' and 'High' risk). 'Medium' and 'High' levels of risk indicate an **unacceptable level of risk of deterioration** (emphasis added) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD), and where there is also growth in abstraction planned, trigger the setting of licence caps to restrict annual average abstraction to its recent actual average level. This is the no deterioration baseline 'S05 NDB_AWC' (labelled 'NDB 2 (S05)' in Table 1). Appendix 2 shows the water bodies at greatest risk of deterioration due to abstraction levels needed to meet growth up to 2032.

The risk matrix results of the scenario modelling shown in Appendix 1 identifies the same SWBs that the Environment Agency raised concerns about in its original evidence for the inquiry. Therefore, the growth scenario modelling work CWC has undertaken has not materially changed the Environment Agency's position that there is an unacceptable level of environmental deterioration risk associated with the water supply required for this development.

It is not possible to associate specific developments with specific abstraction points in the CWC Water Supply Zone. To reduce the risk, the amount of overall growth in Cambridgeshire would need to be reduced or the amount of water it needs would need to be reduced. This can be achieved through later delivery of phases of developments (pushing

more phases to post 2032 occupation) as far as possible. It can also be achieved through greater water efficiency of developments.

Once all risk reduction options have been maximised, then risk management options may be considered. For example, through targeted enhancements to highest risk rivers so they have greater capacity to cope with risk of low flows. Developments can make a financial contribution to these activities, committed to via conditions to be met at reserved matters stage.

The forecast level of abstraction until 2032 (scenario 'WRMP 2030 (S27)') poses a significant (high or medium) risk of deterioration. Growth will add to this risk unless new supply is found. CWC relies on demand management to free up supply for growth until 2032, however their performance to date on delivering demand management in recent years is poor. An important point to note is that even if demand management is 100% or 50% delivered, abstraction levels still pose a significant (high or medium) risk of deterioration ('WRMP 2030' and 'WRMP 2030 50%' columns in Table 1). This is because the timing to deliver demand management measures means won't result in improvements until the late 2020s/early 2030s., and only when a strategic solution is delivered (the Grafham reservoir transfer expected in 2032) does the deterioration risk reduce to a low level ('WRMP 2036' column in Table 1).

5. Conclusion

Based on the review of the material presented, the **Environment Agency still considers its objection to the proposed development as valid and will be retained** (emphasis added). Furthermore the Environment Agency consider that the outputs from the scenario modelling work provide additional information to the local authority, and developers, and should be used in consideration of any future appraisal of appropriate mitigation measures linked to surface water body risk.

The Environment Agency will await the Planning Inspectors recommendations and SoS decision on this matter.

Yours sincerely

A handwritten signature in black ink, appearing to read 'James Bax', written in a cursive style.

James Bax

Water Resources Programme Manager
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List of Appendices

- Appendix 1 – Deterioration risk matrix approach
- Appendix 2 – scenario description and comments
- Appendix 3 - Key SWBs where the scenario modelling work has indicated a medium or high risk of deterioration under Scenario S27.

Appendix 1 – Deterioration risk matrix approach

Deterioration risk matrix description.

This approach was taken from the Environment Agency's guidance on no deterioration investigations for water company WINEP programmes. It is a method that can be applied anywhere that flow series can be created (modelled) and allows a simple assessment of deterioration risk that doesn't require extensive hydroecological data/modelling. This does mean that the method has limitations but is an available tool that has been used across the industry to look at deterioration risk.

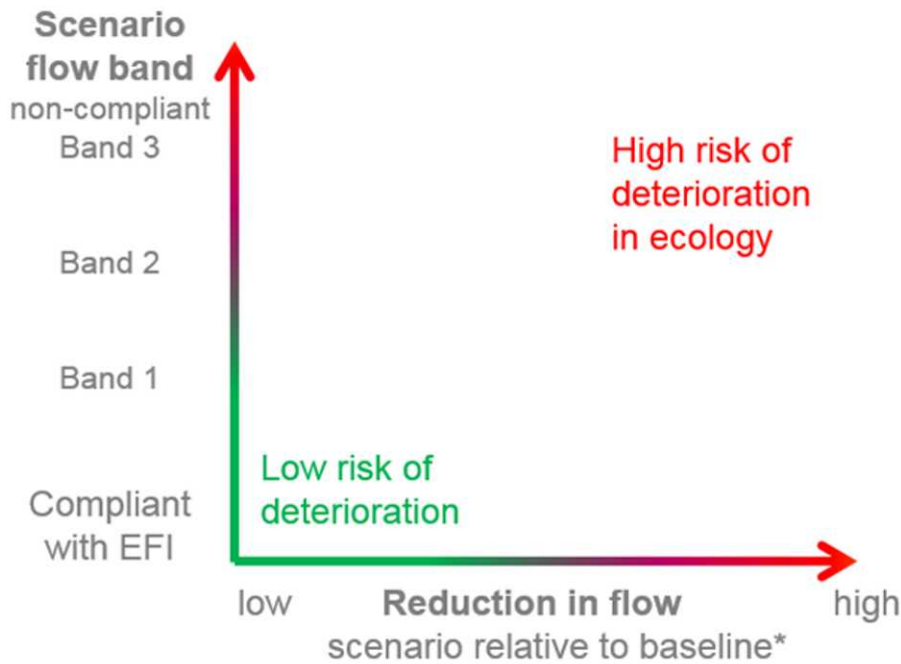
Medium and High levels of risk would indicate an unacceptable level of risk of deterioration and where there is also growth in abstraction planned, trigger the setting of licence caps to restrict annual average abstraction to its recent actual average level. Which in the context of this work, would be the 6-year annual average abstraction level in the no deterioration baseline Scenario NDB_AWC 05 (2010 – 2015).

The Environment Agency considers this is an appropriate way for CWC to model the likely risk of more realistic levels of abstraction to service existing customers and growth given the timescales of the Public Inquiry. An additional step that could be undertaken is to re-run the hydroecological modelling work the Environment Agency undertook as part of its evidence base for the Public Inquiry³ using the revised flow data from CWC's modelling work. This would bring in a stronger link between changes in flow and ecology, however, this work has not been possible in the timescales of the Inquiry.

We use Water Environment (Water Framework Directive) Regulations 2017 (WFD) flow assessment methods to estimate the risk of deterioration in ecological status. These assume that the risk to the ecology increases with the size of the abstraction increase and the resultant flow compliance band (Figure 1).

³ cd1302-ea-appendix-1a-anglian-hydroecology-technical-report.pdf (scambs.gov.uk)

Figure 1 – Surface water risk of deterioration due to increase in abstraction (see Table 1 for description of scenario flow non-compliance bands)



The method to assess the risk of deterioration from increasing abstraction estimates the risk of deterioration in ecological status class due to the change in abstraction from the baseline to a future scenario (Risk assessment methodology, Environment Agency 2015). The risk of deterioration for each water body is calculated by considering the reduction in flow between the baseline and a future scenario⁴ as a percentage of natural flow at Q95, and the resultant scenario flow compliance band. These are used to assign risk categories (Table 1 of this Appendix).

We have adopted 5% of natural flow as the minimum threshold because it is the smallest change likely to be detectable. The different risk values in the lines of the matrix are based on the assumption that the worse the flow compliance band of a water body is, the more vulnerable it will be to deterioration. A change in flow deficit of less than 5% would be unlikely to affect ecology whereas a change of greater than 15% would be expected to affect ecology. Similarly, if the flows are already well below natural and are reduced further then the pressure on the ecology will be even greater.

⁴ These will be the separate modelled scenarios run by Cambridge Water

Table 1 - Surface water risk of deterioration due to increase in abstraction.

Change in flow between no deterioration baseline (NDB_AWC) and forecast scenario, as a % of natural flow at Q95

Forecast flow compliance	>=15%	>=10% and <15%	>=5% and <10%	<5%	<=0%
Band 3	High risk	High risk	Medium risk	Low risk	No risk
Band 2	High risk	Medium risk	Low risk	Low risk	No risk
Band 1	Medium risk	Medium risk	Low risk	Low risk	No risk
Compliant	Low risk	Low risk	Low risk	No risk	No risk
Surplus over natural flow (Qn95)	No risk	No risk	No risk	No risk	No risk

Notes

1. Reduction in flow relative to the baseline is expressed as a percentage of natural flow.
2. Baseline is the NDB_AWC scenario in CWC's modelling work
3. The assessment is based on hydrological thresholds at Q955
4. Flow non-compliance bands are as follows:
Band 1 <25% below EFI (see definition below)
Band 2 25-50% below EFI
Band 3 >50% below EFI
5. Flow compliance bands given after forecast increase in abstraction, i.e. future predicted flow compliance band, not current flow compliance band

It should be noted that the risk matrix approach allows for a rapid screening of deterioration risks but is based on mainly hydrological criteria (river flow changes) and the default standard indicator of whether those flows are supporting a healthy ecology, the Environmental Flow Indicator (EFI). The EFI is set at a level believed to support Good Ecological Status (GES) under the WFD. The EFI allows for regulatory environmental flow targets to be set for rivers anywhere in England. EFIs are flow thresholds that are set with reference to natural flow conditions and aim to ensure that water resources activities do not cause or contribute to the failure of WFD objectives.

Under the Water Environment (Water Framework Directive) Regulations 2017 the assessment of flows in rivers, the hydrological regime assessment, is a supporting element for Good Ecological Status and a defining element for High Ecological Status. This means that it must not be a factor in the failure of the biology to achieve good ecological status or for the water body to achieve good ecological potential if it is heavily modified. This also means

5 The Q95 flow is the flow that is exceeded 95% of the time for a given period of record (in this case 1990 To 2012). This flow is an industry standard for expressing low river flows. It is also the flow percentile at which the WFD hydrology regime compliance assessments are made.

that a failure of the hydrological regime does not automatically constitute a failure of Good Ecological Status under the WFD. However, a failure or worsening of an existing failure of the hydrological regime is treated as an indicator of potential for deterioration when considering abstraction increases and resultant lowering of flows.

The assessment also only looks at the flow compliance/changes at the formal WFD Assessment Point (AP). As noted in our Inquiry evidence document⁶ the AP is a point which represents the individual water body and is located at the bottom of the water body where flow scenarios can include all artificial influences (abstraction and discharges) upstream. This means that in some water bodies, there are flow pressures which can occur in headwaters or upstream of significant inputs (tributaries or artificial discharges) which do not appear to fail under WFD and only become apparent if further investigation is undertaken. Therefore, the results of the risk matrix assessment are likely to be underestimating the risk in the headwaters of the surface water bodies. The assessment will also not address risks to water dependent wetlands.

⁶ cd1301-ea-appendix-1-baseline-data-of-risk-of-deterioration-to-water-bodies-from-water-abstraction.pdf (scambs.gov.uk)

Appendix 2 – scenario description and comments

S27 WRMP2030. This is the best available representation of forecast levels of abstraction by CWC and assumes 100% delivery and success of its planned demand management measures and makes assumptions about 3rd party water companies and other sectors' abstraction at the 2030 timestep. It should be noted that the level of abstraction that is available to CWC is limited to what can be reliably taken in a drought year and therefore is constrained below what it can take in normal years. Affinity Water and Thames Water licences are also only modelled at their respective maximum annual historical rates, which may be different to what the companies' actual forecast being used. The work had this latter Future Predicted abstraction scenario for Anglian Water, but it was not available for Thames and Affinity. Therefore, the results could be over or underestimating the likely level of abstraction.

Scenario S28 is the same as S27, except the success of CWC's planned demand management measures is reduced by 50%.

Scenario S29 represents the forecast level of abstraction by CWC following the delivery of the Grafham transfer in 2032. When the scenario modelling was originally scoped, there was high uncertainty that the Grafham transfer was feasible, so CWC was advised to look at the timestep of the next available supply option, the Fens Reservoir in 2036. The levels of abstraction in S29 are however forecast to be in place by 2032, post Grafham transfer.

The other key scenario is S05 NDB_AWC – this scenario represents the baseline level of abstraction and therefore, hydrological influence of abstraction on river flows that sets the benchmark for assessing deterioration risk against.

S30 Current. In theory, this is the best available representation of the current effect of abstraction on flows at surface water body assessment points. It is based on the actual reported levels of abstraction from the water companies and therefore, is directly comparable to the approach used for deriving the S05 NDB_AWC level of abstraction.

S34 current peak. This scenario holds CWC abstraction at current levels and 3rd party non water company abstraction at their baseline (NDB_AWC) level and just increases the 3rd part water company abstraction rates to peak. Therefore, this scenario can be viewed as an indicator of 3rd party water companies' contribution to overall risk. It shows that even without CWC increasing its abstraction, there are medium and high risks identified for a number of SWBs.

S35 All peak. This scenario is viewed as a more representative likely worst-case scenario than the existing Fully Licensed scenario, where in the latter, all licence holders take their fully permitted level of abstraction every year.

S28 and S32 - These scenarios model a 50% effectiveness of the demand management options before the Grafham transfer. They don't show any change from the 100% effective scenario at the risk matrix scale. Consideration of the modelled changes in flow (tables A1-3 to A.1-6 and tables A2 - 2 to A2-3 in CWC's report) do show some worsening of flow impact under the 50% demand management option scenario, reflecting the need to increase

abstraction from 6 of CWC's sources to offset reduced demand reductions. As the abstraction increase is not at all sites, this helps to explain the relatively small change in the results between the standard and 50% demand management effectiveness scenarios. Another factor is that CWC's forecasts don't assume full savings from year 1 of implementation (2025) therefore, the savings ramp up over the 2025-2030 period and are smaller in the early years. However, CWC's revised dWRMP is still heavily reliant on demand management measures and savings to avoid actual supply/demand deficits. This includes the need to rely on additional demand savings from customer drought restrictions to minimise deficits against its target headroom allowance in a dry year. Target headroom is the planning allowance companies have to make to account for uncertainty and risk in the components of their forecasts. WRMPs are not allowed to have an actual or target headroom deficit under the dry year and (if relevant) the critical period demand scenarios in any year of the 25-year plan period.

S29 and S33 - 2036 scenarios represent the forecast level of abstraction by CWC following subject to the delivery of the Grafham transfer in 2032. The date of 2036 appears in the table because when the scenario modelling was originally scoped, there was high uncertainty that the Grafham transfer was feasible, so CWC was advised to look at the timestep of the next available supply option, the Fens Reservoir in 2036. The levels of abstraction in S29 are however forecast to be in place by 2032, post Grafham transfer.'

Appendix 3 - Key SWBs where the scenario modelling work has indicated a medium or high risk of deterioration under Scenario S27.

Little Ouse (Hopton Common to Sapiston Confluence)	Medium to High	<p>Environment Agency's Hydroecological modelling work indicates that increased abstraction (at fully licensed scenario) is predicted to cause ecological impact and risk of deterioration under WFD.</p> <p>The growth scenario modelling results are an indicator that this deterioration risk may be present at abstraction rates less than Fully Licensed.</p> <p>The SWB benefits from river support, where groundwater can be pumped and discharged into the river to bolster flows during dry periods. However, there are current concerns about the existing river support scheme's ability to mitigate against abstraction in dry years. Increased abstraction will exacerbate this issue.</p>
Cam (Stapleford to Hauxton Junction)	Mostly High	<p>Environment Agency's Hydroecological modelling work indicates a current ecological pressure from historical levels of abstraction and a risk of deterioration at Fully Licensed levels of abstraction.</p> <p>SWB is also influenced by Affinity Water's abstraction further upstream, but CWC is contributing to the overall level of impact and risk of deterioration.</p> <p>Scenario modelling work doesn't factor in the planned improvements to the river support scheme in upstream SWBs on the River Cam that Affinity Water is delivering by 2025</p>

Cam (Audley End to Stapleford)	High	<p>Environment Agency's Hydroecological modelling work indicates current ecological pressure from historical levels of abstraction and a risk of deterioration at Fully Licensed levels of abstraction.</p> <p>SWB is also influenced by Affinity Water's abstraction further upstream, but CWC is contributing to the overall level of impact and risk of deterioration.</p> <p>Scenario modelling work doesn't factor in the planned improvements to the river support scheme in upstream SWBs on the River Cam that Affinity Water is delivering by 2025.</p>
Granta	Medium	<p>Environment Agency's Hydroecological modelling work indicates current ecological pressure from historical levels of abstraction, and a risk of deterioration at Fully Licensed levels of abstraction.</p> <p>Formal WFD Classification for Invertebrates has deteriorated from High to Good Status between the 2019 and 2022 classifications.</p> <p>Scenario modelling work is not believed to have incorporated the planned licence changes that CWC will deliver by 2025. These could reduce the risk scores, but unknown by how much. Initial licence changes were made to CWC's sources affecting the Granta in 2020</p>
Bottisham Lode - Quy Water - wasn't noted in our previous evidence report	Medium	<p>There are known effects on the groundwater table from public water supply abstractions in the catchment. The Environment Agency has provided river support using the</p>

		<p>Lodes Granta groundwater support scheme since 1991. There is some uncertainty however, as to the effectiveness of this support where water can be lost again to ground in downstream reaches in periods of dry weather. Increased abstraction will exacerbate this issue.</p> <p>Formal assessment point (where risk matrix result is generated) is not considered representative (lower impact of abstraction) of the impact/risk of deterioration in the upper reaches of the SWB.</p>
Swaffham - Bulbeck Lode - wasn't noted in our previous evidence report	Medium	<p>Formal assessment point (where risk matrix result is generated) is not considered representative (lower impact of abstraction) of the impact/risk of deterioration in the upper reaches of the SWB.</p>
Cat Ditch -	High	<p>Conclusion of Environment Agency's 2012 WFD hydrology investigation was that that Cat Ditch is naturally ephemeral (no flow in dry periods), and the impact of abstraction does not significantly change this.</p> <p>There is currently insufficient ecology data to look in detail at the SWB due to frequent drying of channel.</p> <p>CWC's is not the main abstraction influence on this SWB but is contributing to the overall level of risk.</p>
Stour (upstream of Wixoe)	Medium	<p>The Environment Agency does not recognise the results as its own modelling work indicates that this SWB remains compliant under the Fully Licensed abstraction scenario at the formal assessment point at the downstream end of the SWB. The</p>

		<p>SWB has significant water discharges into it from sewage treatment works and Environment Agency transfer schemes that pump water into the rivers as part of the Ely Ouse to Essex transfer scheme, which supports abstraction into public water supply reservoirs operated by Essex and Suffolk Water.</p> <p>The Environment Agency has asked CWC to check its assessment for this SWB.</p> <p>However, notwithstanding the compliance at the formal assessment point (where risk matrix result is generated) the effects of abstraction on river flows may be more significant in the headwaters of the SWB which are upstream of the effluent/transfer scheme discharges.</p>
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Appendix 2 (with the exception of Cat Ditch/Stour) does help to confirm the SWBs that are at greatest risk of deterioration, and which would benefit from further consideration by GCP for mitigation works to lower the risks. This would be the minimum recommended SWBs based on the results from scenario S27. However, it is noted that the modelling approach is only able to identify abstraction impacts and therefore, risk assessment at the formal Assessment Point for that surface water body. As noted in Section 2.2.10 of our inquiry evidence document⁷, conditions at the formal assessment point are not always reflective of the abstraction pressures higher up the river, or at wetland sites. Therefore, growth scenario risk assessment results are likely to underrepresent the scale of the effects higher up the rivers and therefore, improvement work in wider SWBs would be beneficial.

It should also be noted that the results of the scenario modelling work indicate the risk of deterioration relative to the no deterioration baseline of the hydrological regime, which itself could be a failing ecological status. No and low risk are related to that starting position, so it should not be inferred that the starting position is automatically representative of a healthy ecology. Getting the ecology back to Good status would form part of the long-term environmental ambition as set out in the Regional Water plan of Water Resources East. A low risk could be low, but the river is already a dry under certain abstraction conditions.

⁷ cd1301-ea-appendix-1-baseline-data-of-risk-of-deterioration-to-water-bodies-from-water-abstraction.pdf (scambs.gov.uk)