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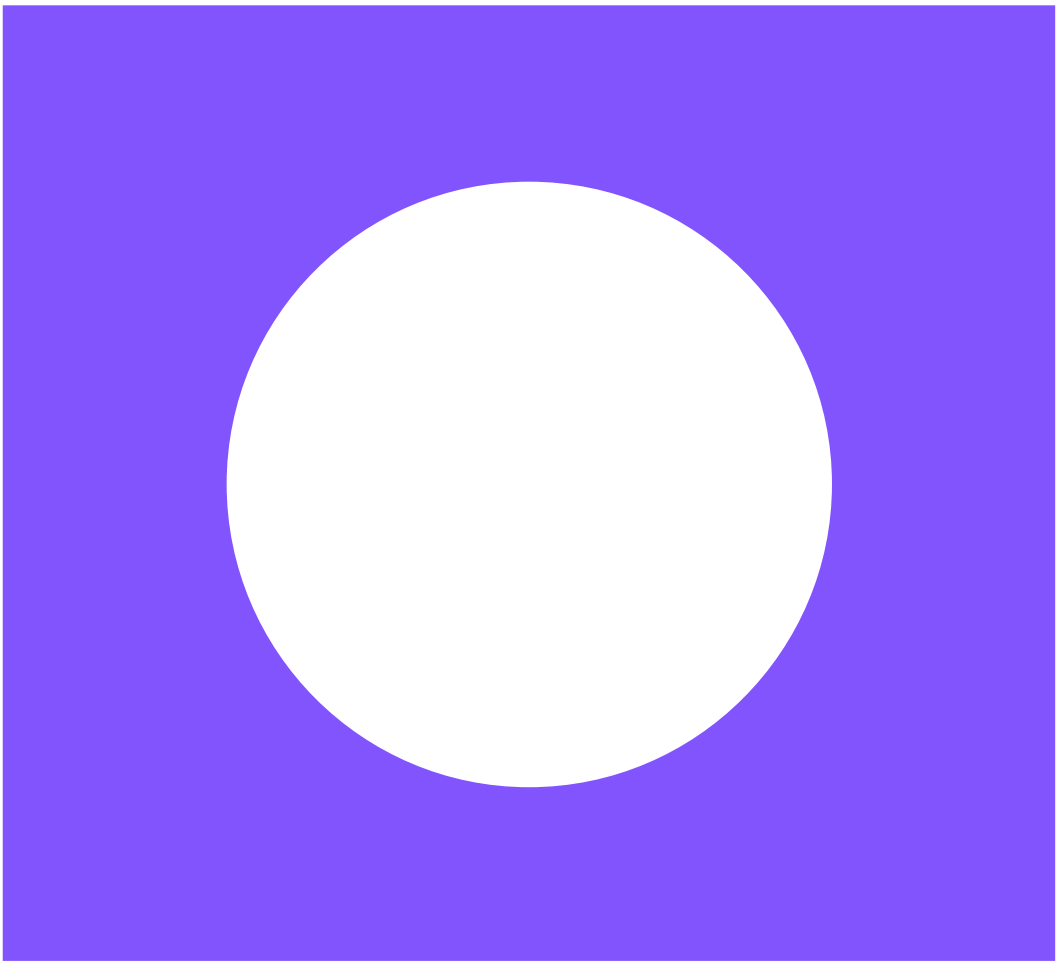

SBB Drought Plan 2027

Appendix 8: Environmental Assessment Report (EAR) Methodology

March 2026

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SBB Drought Plan 2027

Appendix 8: Environmental Assessment Report (EAR) Methodology

March 2026

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
1.0	13/03/26	C.J.	K.M.	M.R.	Draft issue
2.0	17/03/26	J.E.	C.J.	K.M.	Second issue
3.0	26/03/36	J.E.	C.J.	K.M.	Issue for consultation

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Abbreviations

Acronym	Definition
ALG	Cover of Green Filamentous Algae
AMP	Asset Management Period
ASPT	Average Score per Taxon
CIEEM	Chartered Institute of Ecological and Environmental Management
CWS	County Wildlife Sites
DEHLI	Drought Effect of Habitat Loss on Invertebrates
DP	Drought Plan
DPG	Drought Plan Guidance
EA	Environmental Agency
EAR	Environmental Assessment Report
EMP	Environmental Monitoring Plan
EMS	European Marine Sites
EQR	Ecological quality ratio
FCS	Favourable Condition Status
GIS	Geographic Information System
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HEM	Hydroecological Modelling
HEV	Hydroecological Validation
HPI	Habitats of Principal Importance
HRA	Habitats Regulations Assessment
INNS	Invasive Non-native Species
IRM	INNS Response Module
IRZ	Impact Risk Zones
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LIFE	Lotic-invertebrate Index for Flow Evaluation
LNR	Local Nature Reserve
LWS	Local Wildlife Sites
NBN	National Biodiversity Network
NE	Natural England
NEP	National Environment Programme
NERC	Natural Environment and Rural Communities
NFG	Number of functional groups
GB NNSS	GB Non-Native Species Secretariat
NST	Number of Scoring Taxa
NTAXA	Number of macrophyte taxa
PSI	Proportion of Sediment-sensitive Invertebrates
RICT	River Invertebrate Classification Tool
RMHI	River Macrophyte Hydraulic Index

RMNI	River Macrophyte Nutrient Index
SAC	Special Areas of Conservation
SBB	South West Water, Bristol Water, and Bournemouth Water
SEA	Strategic Environmental Assessment
SPI	Species of principal importance
SRO	Strategic Resource Option
SSSI	Site of Special Scientific Interest
TDI	Trophic Diatom Index
UK BAP	UK Biodiversity Action Plan
UKCEH	UK Centre for Ecology and Hydrology
UK TAG	United Kingdom Technical Advisory Group
UKWIR	UK Water Industry Research
WFD	Water Framework Directive
WINEP	Water Industry National Environment Programme

1 Introduction

1.1 Purpose of this document

South West Water, Bristol Water and Bournemouth Water (SBB) have produced their statutory Drought Plan 2027 (DP27), which sets out how SBB intends to manage water resources in response to drought events over a five-year period from 2027 to 2032. The DP27 is supported by detailed environmental assessments of the preferred supply actions, which are documented in Environmental Assessment Reports (EARs) and accompanying Environmental Monitoring Plans (EMPs). All preferred actions will have an EMP; however, not all actions will require an EAR at this stage. Under SBB's Drought Permit Readiness programme of work, all drought level 2/3a actions will have an EAR in place by the end of Asset Management Period (AMP) 8. The purpose of this document is to set out the methodology for production of EARs and EMPs.

The EARs seek to evaluate the additional environmental impacts (including impacts on recovery periods) resulting from the implementation of drought plan actions, rather than the inherent environmental impacts caused by the drought itself. The EAR process also identifies mitigation measures to avoid or reduce environmental impacts, and the monitoring needed to understand or confirm impacts on the environment (presented in an EMP). For SBB's DP27, Drought Permits are the main type of supply action and therefore the EARs will be focused on these.

The 'Water Company Drought Plan Guideline, 2025'[1] (DPG 2025) was published by the Environment Agency in 2025 to guide the drought plan development. This is supported by the supplementary guidance 'Environmental Assessment for Water Company Drought Planning'[2] (2025), which sets out the approach to environmental assessment of drought plans. SBB's DP27 and the accompanying EAR Methodology (this document) have been informed by these guidance documents. The methodologies and approaches applied are also aligned with the requirements of the Drought Plan Regulations 2005 and the Drought Plan (England) Direction 2016.

Both the DP27 and this EAR Methodology are subject to formal consultation with the Environment Agency, Natural England (NE) and other stakeholders.

This document aims to:

- Set out the methodology for undertaking the environmental assessments of SBB's DP27 supply actions;
- Provide a platform for the Environment Agency, Natural England and other stakeholders to influence the methods, data considerations, and outputs of the environmental assessment documents;
- Consolidate the approaches and methodologies used in completing the environmental assessments associated with SBB's previous and current EARs to reduce the extent of review required by regulators;
- Provide an audit trail for identifying contributors and subsequent changes to the methodology; and
- To ensure continuity in environmental assessment approach for future SBB Drought Plans.

It should be noted that this EAR Methodology does not cover the approaches for undertaking a Strategic Environmental Assessment (SEA) or a Habitats Regulations Assessment (HRA) for the DP27. The

[1] Environment Agency (2025) *Water Company Drought Plan Guideline, 2025*. Available at: https://www.gov.uk/government/publications/water-company-drought-plan-guideline-2025/water-company-drought-plan-guideline-2025

[2] Environment Agency (2025) *Environmental assessment for water company drought planning. Guidance LIT 75033*.

methodology for undertaking the SEA is set out in the SEA Environmental Report which accompanies the Drought Plan 2027 (Annex 2), and follows the UK Government guidance document 'A practical guide to the SEA

Directive'[3] (2005). The HRA is informed by the UK Government guidance 'Appropriate Assessment – Guidance on the use of Habitats Regulations Assessment'[4] (2019) and the European Commission 'Managing Natura 2000 sites – The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC14'[5] (EU, 2019). The SEA and HRA also follow the UK Water Industry Research (UKWIR) 'Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans'[6] (2021).

1.2 Content of the report

This document sets out the approach to undertaking the assessment of the environmental impacts associated with the different supply actions within SBB's DP27. It details the approach to identifying the study area for each supply action (both alone and in-combination with other actions); identification of the relevant sensitive environmental features within the identified study area (based on the risk of being impacted by a particular supply action during the period of implementation); and the approach undertaken to determine the significance of impacts on these sensitive features, leading to the development of mitigation actions and monitoring plans. It also sets out the baseline data that will be used to inform the assessment of sensitivity and impacts on environmental features.

This document includes the methodologies associated with:

- Environmental Assessment Reports (EARs), comprising:
  - Identification of the study area and baseline conditions
  - Identification of likely changes to the environment from the supply action
  - Identification of affected features and their sensitivity
  - Assessment of likely environmental impacts and their significance
  - Identification of mitigation measures
  - Identification of monitoring requirements;
- Environmental Monitoring Plans (EMP), which are appended to EARs;
- Water Framework Directive (WFD) Regulations compliance assessment; and
- EAR and EMP reporting structure.

[3] GOV.UK (2005) *A Practical Guide to the Strategic Environmental Assessment Directive*. Available at: https://assets.publishing.service.gov.uk/media/5a78ec0740f0b62b22cbddd2/practicalguidesea.pdf

[4] GOV.UK (2019) *Appropriate Assessment – Guidance on the use of Habitats Regulations Assessment*. Available at: https://www.gov.uk/guidance/appropriate-assessment

[5] European Commission (2019) *Managing and protecting Natura 2000 sites.* Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/natura-2000/managing-and-protecting-natura-2000-sites_en

[6] UKWIR (2021) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans*. Available at: https://ukwir.org/environmental-assessments-for-water-resources-planning

2 Consultation

2.1 Consultation Requirements of the Drought Plan Guidelines

The Environment Agency guidance for environmental assessment for water company drought planning requires water companies to discuss the environmental assessments (including mitigation measures) and monitoring plans as early as possible with the Environment Agency and Natural England when developing a drought plan. This should be part of the preliminary discussions held with the regulators, other organisations and individuals who could be affected by drought management actions.

The guidance requires Natural England to be engaged where a plan is likely to affect protected sites (e.g. Habitats sites and SSSIs). The DPG also requires a water company to contact any relevant National Park Authority about any actions that will take place within their boundaries, and relevant local authorities in relation to Local Wildlife Sites.

2.2 Consultation for DP27

Throughout the development of the Drought Plan 2027, consultation with the Environment Agency and Natural England has been ongoing to ensure the Plan meets expectations. Workshops were held throughout 2025, primarily to present early SEA, HRA, WFD and INNS assessment findings, but also to identify key regulator concerns and insights on specific actions. Throughout this process, the planned approach to this EAR Methodology and SBB's permit readiness programme was discussed, with the opportunity for formal feedback on these items during the draft Drought Plan and SEA Environmental Report consultation in spring 2026.

Following the Drought Plan consultation, comments on this EAR Methodology will be reviewed and updates will be made to the document prior to final sign off on the methodology, where required.

SBB will continue to actively engage with regulators and other stakeholders during the preparation of any updated and new EARs, which are required for drought permit actions which have been identified for implementation at drought levels 2 and 3a. If any of the actions identified at drought level 3b are brought forward and require a drought permit, EARs will also be produced for these actions.

3 Approach to Environmental Assessment Reports

3.1 Requirements of the Drought Plan Guidance

The DPG 2025 stipulates that water companies must demonstrate in their drought plan that they have met their responsibility to monitor, assess and, where possible, avoid, reduce or mitigate for the environmental impact of all their supply side drought management actions. Assessments should consider year-round impacts, in addition to summer impacts and the post-drought recovery period. For SBB, these supply actions include:

- Increasing annual abstraction licence limits;
- Reducing hands off flow levels;
- Reducing or not releasing compensation flows;
- Reducing or not providing fish bank releases; and
- Extension of pumped storage season.

To support this, the DPG 2025 requires the completion of environmental assessments and production of an environmental monitoring plan for each supply action included in a drought plan. The environmental assessments should also include any measures to avoid, reduce or mitigate impacts, where appropriate.

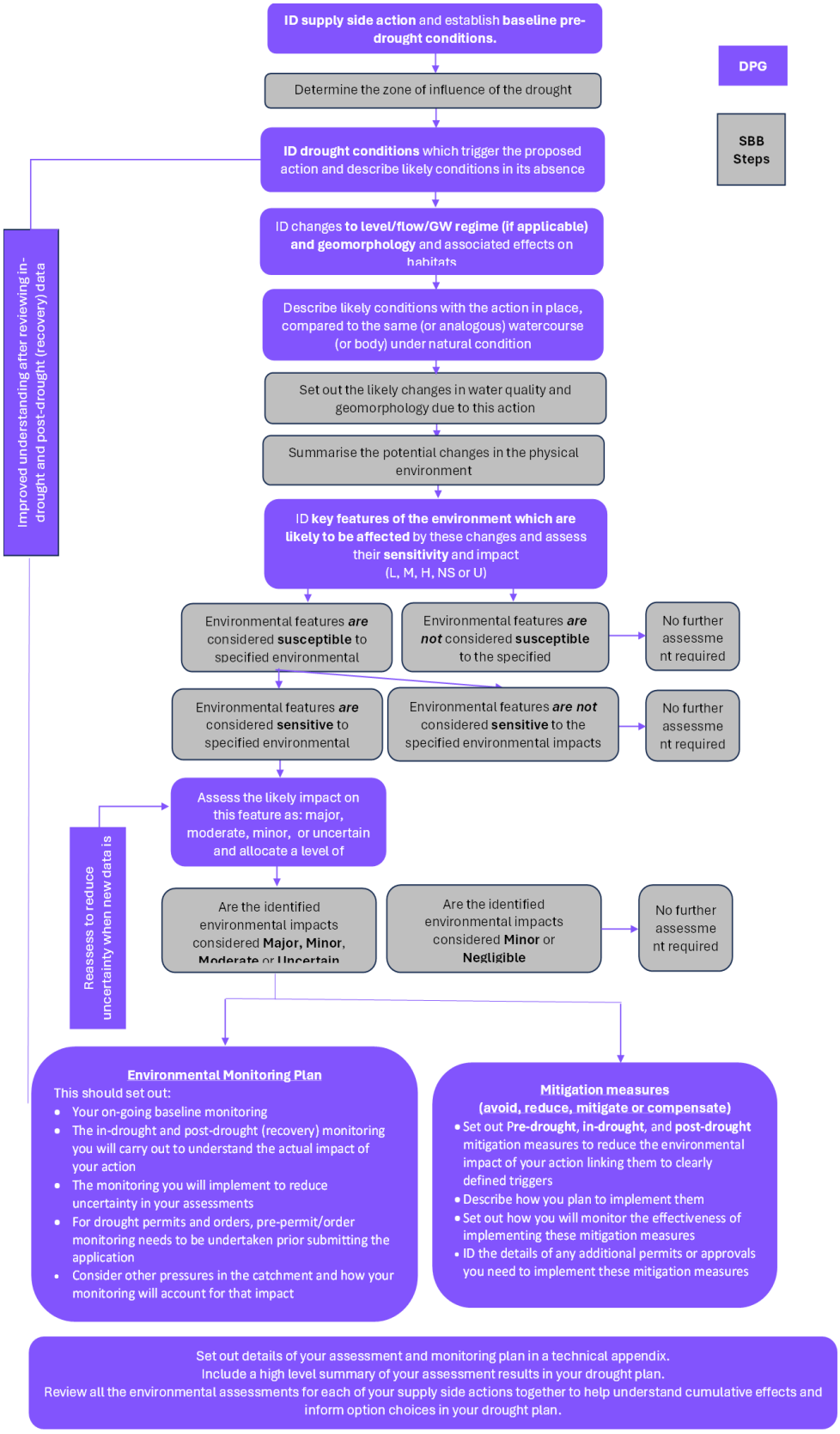
In completing the environmental assessments, the EARs will reflect the requirements of the DPG 2025 as follows:

- Identify the supply action study area and establish baseline (pre-drought) conditions and baseline in-drought (pre-supply action) conditions (see **Section 3.3**);
- Setting out the likely changes to the hydrology, hydrogeology and geomorphology, and associated effects on habitats due to a proposed action (see **Section 3.4**);
- Identifying the key features of the environment which are likely to be affected by these changes and assess their sensitivity and impact (see **Section 3.5**);
- Assess the likely impact on these features, allocate a level of confidence in the assessment and set out the actions to take to reduce uncertainty (see **Section 3.6**);
- Setting the measures to avoid, reduce or mitigate impacts (see **Section 3.7**) and where datasets are considered insufficient to undertake an environmental assessment it is the responsibility of the water company to implement environmental monitoring to generate the information required (see **Section 4**).

The DPG 2025 also requires water companies to consider the combined environmental effects of their supply side drought actions, and where relevant, the combined effects of their actions with those of neighbouring water companies and other abstractors (see **Section 3.6.7**).

The overarching approach to environmental assessment is set out below in **Figure 3.1**. Ultimately, the environmental assessments should inform SBB's choices on when and how to use the different drought management supply actions within the DP27.

Figure 3.1: Approach to undertaking environmental assessments as identified in the DPG 2025



Source: MacDonald, 2026, based on the EA's DPG 2026. *Note, the steps identified in purple are as per the DPG 2025 and the steps indicated in grey are additional/interim steps included by SBB.*

3.2 Relevant guidance and legislation

The assessment of the potential environmental effects associated with each drought action will be prepared in accordance with Government regulations and good practice guidance, including:

- The DPG 2025, associated appendices, and supplementary guidance on environmental assessments for water company drought planning (2025);
- Defra (2025) Drought Plan Direction;
- Defra (2021) Habitats Regulations Assessments: protecting a European site;
- Defra (2023) Complying with the biodiversity duty;
- Defra: Summary of legislation relevant to INNS;
- Institute of Sustainability and Environmental Professionals (ISEP, formerly IEMA) (2004) Guidelines for Environmental Assessment;
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2019) Guidelines for Ecological Impact Assessment;
- Conservation of Habitats and Species Regulations 2017 (as amended);
- Water Environment (Water Framework Directive) Regulations 2017 including the objectives set out in river basin management plans;
- Common Implementation Strategy for the Water Framework Directive and Floods Directive;
- Environment Agency (2022) River Basin Management Plans;
- Wildlife and Countryside Act 1981;
- Water Resources Act 1981;
- Environment Act 1995;
- Invasive Alien Species (Enforcement and Permitting) Order 2019 on invasive alien (non-native species).
- The Countryside and Rights of Way Act 2000;
- Salmon and Freshwater Fisheries Act 1975 and the Eel (England and Wales) Regulations 2009;
- Water Resources Act 1981;
- Environment Act 1995;
- Eels Regulations 2009;JNCC (2007) UK BAP list of UK Priority Species;
- Centre for Environment, Fisheries and Aquaculture Science, Environment Agency and Natural Resources Wales (2023) Assessment of salmon stocks and fisheries, England and Wales 2022;
- Section 40 and 41 of the Natural Environment and Rural Communities (NERC) Act 2006; and
- UK Water Industry Research (2020) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans.

3.3 Baseline

3.3.1 Identifying the study area

The study area comprises the focus reach for watercourses and a focus area for lake or reservoir waterbodies.

The focus reach for watercourses will be determined through consideration of hydrological, geomorphological and or hydrogeological data together with baseline ecological data to define the extent of the focus reach. The focus reach will therefore extend to the geographical limit at which the relevant ecological features are no longer considered sensitive to anticipated changes in physical conditions (e.g.,

flow, geomorphology, water quality) or where such changes are expected to be of insufficient magnitude to produce significant ecological effects.

For actions where lake or reservoir levels are potentially affected, the whole waterbody will be included with a focus 'area' (rather than 'reach').

3.3.2 Baseline scenarios

The DPG 2025 indicates that baseline data is important to inform both the assessment of the sensitivity to drought actions (screening) and assessment of impacts on sensitive features. The baseline conditions for the environment should be set out based on existing data, monitoring and modelling where appropriate, and it should consider both normal (pre-drought) and in-drought pre-permit conditions.

A baseline scenario for the environment will be developed based on existing data, monitoring, and modelling where required. The baseline scenario will be agreed with the Environment Agency and Natural England (where appropriate).

The baseline will include assessment of the pre-drought recent actual scenario. For any high environmental risk actions, a more technically detailed assessment will be undertaken. All assessments will include the following:

- Baseline pre-drought scenario (recent actual and naturalised if necessary);
- In-drought, pre or without drought action scenario;
- In-drought, drought action implemented scenario; and
- Post-drought scenario.

3.3.3 Baseline data sources

With regards to ***screening***, the DPG 2025 indicates that a key part of the environmental assessments is understanding how sensitive each environmental feature of interest is to the likely changes in hydrology (or hydrogeology) caused by a drought action. To assess environmental sensitivity, the DPG 2025 suggests the use of good quality, long-term environmental datasets. This is because long-term datasets are more likely to cover different flow conditions, including drought events, which will help improve the understanding of how the environment responds to changing flow conditions. For flow and water quality data a minimum of 12 months data is required, but ideally at least 3 years. For ecological baseline data, 3 years is required as a minimum as per the EA guidance. Modelling tools, such as the Hydroecology toolkit (HE toolkit)[7], could also be used to used help assess environmental sensitivity.

The principles underpinning the HE toolkit have been developed based on the relationships between invertebrates and flow. If any link is found, it can be used to understand the potential impacts of drought. The benefit of using the HE toolkit will be evaluated for each action on a case-by-case scenario. Its application will be dependent on available data and may vary depending on other pressures affecting waterbodies. Therefore, a more tailored analysis will be conducted once the baseline has been assessed. Any use of the HE toolkit will be discussed and agreed with the Environment Agency before commencing the analysis.

The DPG 2025 also requires the use of the best available data, evidence and analysis methods to inform the environmental ***assessments***. Types of evidence which can be used include:

- Observed historical datasets;
- Observed datasets from on-going monitoring programmes;
- Expert judgement relating to specific habitat types;

[7] The Hydroecology toolkit (HE toolkit) is available at: https://apem-ltd.github.io/hetoolkit/. Please contact the Environment Agency Hydroecology Team for queries regarding the HE toolkit hydroecologyteam@environment-agency.gov.uk.

- Evidence from other nearby sites which are similar to your site of interest; and
- Modelled/simulated datasets.

Ecological and geomorphological evidence should underpin the assessment and justify any matrices or hydrological thresholds which may be identified. Understanding the environmental datasets that are required and the availability of these datasets will inform the level of confidence (low, medium or high) that can be assigned to the environmental assessments and sources of uncertainty that will have to be reduced where possible. A justification should be set out for this based on the quality of the datasets, evidence and analysis methods you have used to inform your assessment.

The DPG 2025 indicates that the EA will have various environmental monitoring programmes which will provide data that could supplement bespoke monitoring programmes. EA data can now be accessed directly through the hydrology data explorer[8] and the ecology and fish data explorer[9]. The HE toolkit could also be used to download and assemble datasets.

The baseline will also consider information from WINEP studies assessing the impacts of current abstraction and environmental status of impacted rivers (e.g. where rivers are already failing environmental flow targets).

The DPG 2025 indicates that the assessments should also consider other third-party sources of environmental monitoring data (for example, the National Biodiversity Network (NBN) Atlas, Local Wildlife Trusts, river citizen science monitoring groups, biological records centres, angling clubs and site managers) and consider how modelling approaches can be used to predict the environmental baseline. This data will be utilised alongside that collected through water company monitoring programmes, for example, the National Environment Programme (NEP).

3.3.4 Action data sources

The data sources proposed for undertaking the EARs have been listed in **Sections 3.4, 3.5 and 3.6**. In addition to issue-specific sources such as the Hydro-ecology Toolkit and Environment Agency data on INNS, existing data related to the actions should be utilised where available to support of detailed understanding of conditions. SBB's EARs will be a mix of updates to previous EARs and new EARs. As such, updates to EARs are likely to have existing data which should be drawn upon, whereas new EARs may have less existing baseline data available.

Data sources such as WINEP investigations, previous EARs, drought permits and SBB-owned monitoring data should be requested and reviewed as part of any EAR work undertaken. Existing HRA, WFD and INNS assessments for actions should also be reviewed. It is advised that SBB are consulted at an early stage to enable data sharing and advice in relation to what information may be available.

3.4 Likely changes to the environment

3.4.1 Water flows and levels

The DPG 2025 requires an assessment of the likely changes in river flow regime and groundwater levels due to implementation of drought permit abstractions, to identify the scale of potential environmental impacts on sensitive receptors and relevant assessment points. Although the DPG 2025 informs the hydrometric dataset to be applied in the environmental assessment, it does not provide a methodology to determine hydrological impacts. Therefore, a bespoke approach is proposed to assess the hydrological impact within the study area, in terms of the scale, nature, duration and timing of impacts.

An increase in surface water abstraction under a drought permit will impact on flow downstream of the abstraction point. An increase in groundwater abstraction under a drought permit would lead to an

[8] Defra Hydrology Data Explorer. Available at: https://environment.data.gov.uk/hydrology/landing

[9] Environment Agency Ecology & Fish Data Explorer. Available at: https://environment.data.gov.uk/ecology/explorer

increased cone of depression in groundwater levels, potentially affecting baseflow in rivers, groundwater dependent/ non-surface water receptors such as abstraction wells, springs or groundwater dependent ecosystems. It could also mean that surface water impacts would extend upstream of the abstraction point or, in some instances, to other downstream watercourses.

A hydrological, and where appropriate hydrogeological, impact assessment will be undertaken for the DP27. These assessments will be mainly supported by available hydrological, hydraulic or hydrogeological modelling outputs covering the catchments where drought management actions are proposed. The selection of modelling will depend upon the type of action and whether existing models are available and will be based on existing SBB water resources team data and models where possible. If WINEP investigations have been undertaken in the study area, information from these studies will also be taken into account. These tasks will help to assess the extent to which river flows are influenced by the drought permit abstractions and/or discharge reductions once operational (additional details provided in **Sections 3.4.1.1 to 3.4.1.3**). The model outputs will be analysed to quantify extent, duration and severity of flow/level changes resulting from drought permit operation, to assess impacts on water resources.

The period of use for the proposed drought actions are stated within the supporting information for each action in the DP27. The impact assessment will therefore cover the duration of the proposed drought permit operations stated and the evaluation of potential impacts on surface water and groundwater recovery in response to drought actions, particularly if the action is proposed for operation in summer months when flows/levels are naturally lower.

For each study area, appropriate drought periods will be selected from a series of severe historical drought events, to establish the 'impact periods' to be considered for the assessment. The selection of these events should include an adequate review of a series of inputs (e.g. climate data, river flows, and consideration of other influences such as changes in flow control structures etc). For the same reasons, data collected during key historical drought events will require careful consideration in respect of monitored abstractions, discharges, observed water levels and river flows, to confirm the time periods of interest to inform the EAR.

For groundwater abstractions, the impact of a drought permit could extend beyond the period of abstraction depending on the local hydrogeology of the area and the duration of the drought itself. Where this applies, a review of the recovery period will be considered as part of the assessment undertaken in each EAR report.

3.4.1.1 Perennial flowing watercourse hydrological methodology

For perennially flowing watercourses, potential impacts on flows posed by abstractions as part of the drought permit scheme, will be assessed analysing modelled flows outputs (where available) under the EAR baseline scenario and compared with those modelled under active drought permit conditions.

The potential changes in flow will be expressed as both actual change (i.e. change in Ml/d) and the percentage change for relevant flow statistics (such as Q_{95}). These will be compared to naturalised flow and the environmental flow indicator (EFI). To inform the assessment of environmental features, further consideration of the hydrological impacts will be made; this shall include commentary on risk to a watercourses' wetted perimeter, depth and velocity.

During the drought permit implementation period (action specific) the assessment will focus on sensitivity to changes at low flows (represented by year-round Q_{95} and Q_{95} summer[10]) and extreme low flow (represented by year-round Q_{99} and Q_{99} summer). During the winter drought recovery period, when watercourses have relatively lower sensitivity to changes in low flow, and moderate sensitivity to changes in moderate flow, the assessment will focus on the percentage reduction in year-round low flow (Q_{95}, year-round) and year-round median flow (Q_{50}, year round) to describe the likely impacts.

[10] Flow statistics indicate the proportion of days flow is equalled or exceeded. Therefore, Q_{95} indicates flow equalled or exceeded 95% of the time in the measured record (equivalent to 347 days in a typical year).

3.4.1.2 Intermittently flowing watercourse hydrological methodology

This methodology is applied to watercourses, potentially impacted by the drought permit operations, that flow for most of the time but occasionally cease to flow in response to decreased water availability, for example due to drought events, where there is increased evapotranspiration or bed seepage during low flow conditions. Examples of watercourses where this methodology could apply, includes ephemeral watercourses and chalk/limestone streams that may dry along their length due to groundwater-surface water interactions.

A screening for intermittently flowing watercourses will be completed comparing outputs extracted from different scenarios, addressing impacts considering the following categories:

- Drought permit abstractions cause dry river reaches, which would not dry under the EAR baseline scenario.
- Drought permit activities cause river reaches to dry earlier (i.e. more than a week) and/or recovering later (i.e. more than a week) and hence flow reductions occurring in the channel for longer than a week.
- Drought permit activities causing river reaches to dry earlier (up to a week) and/or recovering later (up to a week) and hence flow reductions occurring in the channel for up to a week. Or if the drought permit were a secondary flow driver (e.g. flow through gravels being primary cause of flow losses rather than the drought permit).
- Negligible impacts on river flows.

This analysis will be supported by a statistical assessment of groundwater model or river flow model outputs and flow accretion profiles processed for key river reaches.

3.4.1.3 Changes to groundwater methodology

Where groundwater models are available across the SBB region, these will be used to understand the proposed drought action hydrogeological impact, in terms of the scale, nature, duration and timing. Sensitivity testing against several scenarios will be undertaken to achieve this.

Where groundwater models are not available, groundwater impacts will be modelled in the same way as hydrological impacts across the SBB region using hydrological models. This is due primarily to the nature of ground-surface water interactions in these regions.

3.4.1.4 Changes in lake water level methodology

This methodology is applied to reservoirs or lakes, potentially impacted by the drought permit operations. A screening for lakes will be completed comparing outputs extracted from different scenarios, addressing impacts considering the following categories:

- Drought permit abstractions cause lake water levels to be lower than under current operation.
- Drought permit activities cause lake water levels to lower earlier (i.e. more than a week) and/or recovering later (i.e. more than a week) and hence lake level changes for longer than a week.
- Drought permit activities causing lake water levels to lower earlier (up to a week) and/or recovering later (up to a week) and hence lake water levels occurring for up to a week.
- Negligible impacts on lake levels
- Drought permit action allows lake water levels to remain higher than under current operation.

This analysis will be supported by a statistical assessment of hydrological model outputs. This analysis will be based on the UKTAG River flow for good ecological potential[11] which set out the five important flow factors which support good ecological health. These include low flows (minimum flows needed to

[11] UK Technical Advisory Group on the Water Framework Directive (2013) *River flow for good ecological potential, final recommendations*. December 2013. V1.0

maintain habitats) as well as spring and autumn flows which support fish migration, late summer/early autumn flows to disperse biota and flood flows which refresh channel habitats. Drought permits could impact not only the annual minimum flow but also the spring and autumn flows.

3.4.2 Water quality

In support of understanding the potential changes in the physical environment and the sensitivity of the environmental features associated with each drought action.

For WFD classification, the EA has set out[12] what pressures, including water quality pressures, each biological quality element is capable of responding to. following UKTAG evidence[13]. For the purposes of assessment in the previous Drought Plan 2022, fish, macrophytes, macroinvertebrates and water dependent terrestrial ecology (associated with protected sites) were identified as sensitive environmental features requiring monitoring during operation of drought actions[14]. For rivers, these sensitive features could be impacted by changes in dissolved oxygen saturation, ammonia concentration, orthophosphate concentration, temperature and other water quality impacts arising from drought action implementation. For lakes, the sensitive features could be impacted by changes in transparency, thermal conditions (temperature), oxygenation conditions (dissolved oxygen saturation), salinity, acidification status and nutrient conditions (total nitrogen and total phosphorus) and other water quality impacts arising from drought action implementation.

Routine Environment Agency monitoring data along with any data available from relevant SBB monitoring will be reviewed to provide an overview of water quality in the focus reach of each drought permit for DP27. Any impacts on water quality identified as significant due to drought action operation should be considered in both the screening of environmental features, the scope of any detailed assessment of impacts and the extent of any monitoring and mitigation required.

For DP27, the baseline data will be updated to include the latest available data, i.e. between 2009-2023. The location of any survey sites that inform the baseline conditions, the number of surveys completed at each site, and the dates when surveys were undertaken, will be provided. This information will be used to define the confidence of the assessment (low, medium or high). A justification should be set out for this based on the datasets, evidence and analysis methods used to inform the assessment. For DP27 the impact assessment will consider the updated baseline data (including the updated hydrological information to assess water quality trends).

An assessment will also be carried out to identify key discharges which could currently change baseline water quality in the focus reach. Consideration will be given to how change in flow could lead to changes in dilution potential downstream and the impact of this reduction in dilution potential. For lakes consideration will be given to how changes in lake water levels could impact on lake water quality.

For options which consider transfer of water from one source to another, assessment will be carried out to identify key differences between the two sources, and the implications of the transfer on water quality parameters, as well as how changes in flows in both sources could impact dilution potential downstream.

The classification of potential water quality impacts are outlined in **Table 3.1** below.

[12] Environment Agency (2011) *Method statement for the classification of surface water bodies v2.0 (external release)*. Monitoring Strategy v2.0 July 2011 Table 2

[13] UK Technical Advisory Group on the Water Framework Directive (2008) *Recommendations on Surface Water Classification Schemes for the purposes of the Water Framework Directive December 2007* (alien species list updated – Oct 2008 and Nov 2008). Appendix 1.

[14] South West Water & Bournemouth Water (2022) *Final Drought Plan*.

Table 3.1: Classification of potential water quality impacts

Impact	Description - rivers	Description - lakes
Major	A major risk to water quality under low river flow (without the drought permit/order in place). For surface water bodies, this may affect the suitability of the water quality to maintain the current WFD status for fisheries and macroinvertebrates, with a high risk of deterioration in WFD status; and exacerbation of the risks due to flow reduction from the drought permit/order.	A major risk to water quality from changes in lake levels (without the drought permit/order in place). This may affect the suitability of water to maintain current WFD status for biological elements, leading to a high risk of deterioration in WFD status, and exacerbation of the risks due to level changes from the drought permit/order, or increased risk of algal blooms.
Moderate	A moderate risk to water quality under low river flow conditions (without the drought permit/order in place). For surface water bodies this may affect the suitability of the water quality to maintain the current WFD status for fisheries and macroinvertebrates, with a moderate risk of deterioration in WFD status; or exacerbation of a minor risk due to the flow reduction from the drought permit/order.	A moderate risk to water quality from changes in lake water levels (without the drought permit/order in place). This may affect the suitability of the water quality to maintain the current WFD status for biological elements, with a moderate risk of deterioration in WFD status; an exacerbation of a minor risk due to the level changes from the drought permit/order.
Minor	A minor risk to water quality under low river flow conditions (without the drought permit/order in place). For surface water bodies this may have a minor effect on water quality but with no risk to the current WFD status for fisheries and macroinvertebrates; or exacerbation of a minor risk due to the flow reduction from the drought permit/order	A minor risk to water quality from changes in lake water levels (without the drought permit/order in place). This may have a minor effect on water quality but with no risk to the current WFD status for biological elements; or exacerbation of a minor risk due to the level changes from the drought permit/order.
Negligible	Indicative of no significant risk without the drought permit/order in place nor exacerbation of risk by the flow reduction/groundwater level reduction from the order/permit.	Indicative of no significant risk without the drought permit/order in place nor exacerbation of risk by the level changes from the drought permit/order.

3.4.3 Geomorphology and habitats

3.4.3.1 Rivers

In support of understanding the potential changes in the physical environment and the sensitivity of the environmental features associated with each drought management action, a review will be undertaken of the impacts to fluvial geomorphological processes.

The assessment will be informed by considering baseline data available for each hydrological reach identified. These data may include:

- Information on the presence, location and extent of geomorphological features within a river (e.g. depositional and erosional features, bank morphology, bed substrate, etc.);
- River Habitat Surveys;

- Information on suspended solids and channel sediment particle size;
- Data provided from the hydraulic modelling on flow velocities;
- An understanding of anthropogenic modification of the channel bed and banks, where relevant, including any in-channel barriers to migratory species (e.g. weirs);
- Photographs of the area relevant to each action; and
- These data will be supplemented with data where available from walkovers undertaken as part of the Baseline Monitoring Programme for the SBB DP. Useful data representative of baseline conditions may include from comparable rivers. See current EAR monitoring plans for further information on the Monitoring Programme.

Using this information in association with the potential hydrological changes, relevant pressures on the sensitive habitats within an impacted river will be discussed and the impacts classified. Key impacts that will be considered include:

- Changes in wetted width and depth;
- Changes in exposure of bed and banks;
- Reductions in flow velocity;
- Change in sediment dynamics, particularly sediment deposition; and
- Impact of changes in flow, depth and velocities at relevant anthropogenic structures.

Seasonally variability will be taken into account as part of the assessment and monitoring programme. The assessment process will include evaluating the impacts of flows and determining their potential effects on geomorphological features. Any significant impacts on geomorphology will inform the screening of environmental features, the scope of detailed impact assessments, and the planning of monitoring and mitigation measures.

Baseline information will be gathered from existing sources including previous EARs where available. Additional data sources may include survey reports undertaken as part of river restoration projects.

3.4.3.2 Lakes / reservoirs

For actions which involve changes in abstractions, releases or discharges in to or from lakes or reservoirs a review will be undertaken of the impacts to reservoir morphology. The assessment will be informed by considering baseline data available for the lake/reservoir identified. These data may include information on the presence of in lake depositional features, structure of the lake shore, quantity, structure and substrate of the lake bed, phytoplankton, macrophytes and macroinvertebrate communities.

Using this information in association with the potential water level changes (compared to baseline operation, relevant pressures on the sensitive habitats within an impacted lake will be discussed and the impacts classified. These impacts are most likely to be due to changes in exposure of bed and shoreline from water level changes.

Seasonally variability will be taken into account as part of the assessment and monitoring programme. The assessment process will include evaluating the impacts of level changes and determining their potential effects on geomorphological and ecological features. Any significant impacts on geomorphology or ecology will inform the screening of environmental features, the scope of detailed impact assessments, and the planning of monitoring and mitigation measures.

Baseline information will be gathered from existing sources including previous EARs where available. Additional data sources may include survey reports undertaken as part of WINEP or other environmental projects.

3.4.4 Other environmental pressures

The overview of the physical environment will include identification of both flow and water quality pressures in the study area.

3.4.4.1 Flow pressures

During an environmental drought, abstraction activities could lead to additional pressure on river flows and aquifers and potentially exacerbating natural low flows.

The list of other surface and groundwater abstractors considered in each EAR will be updated with the most recent data for DP27, obtained through data request from the Environment Agency. This will include any new licensed abstractions, while unlicensed abstractions will not be identified or assessed within the EARs.

3.4.4.2 Discharge pressures

Discharges may be considered as beneficial as they contribute more flow to rivers, however, they may also pose risks to water quality (noting that only abstractions are considered as flow pressures in the section above).

Discharges in fact can exacerbate water quality impacts during a drought and the post drought recovery period, where river flows are likely to be lower than usual. This could lead to cases where there is not enough water available in the waterbody to dilute discharges, such as final effluent disposed from sewage treatment works (STWs). Discharges impacting the oxygen balance, ammonia concentration and soluble phosphorus concentration in the river reaches have been reviewed.

An overview of likely water quality pressures will be provided for each drought action in DP27, including information such as:

- Discharge permits in the focus reach (including numeric water quality and flow conditions where these are set).
- Routine riverine water quality monitoring data for the water quality determinands of dissolved oxygen saturation, orthophosphate and total ammonia for relevant monitoring sites in the focus reach and significant tributaries (or dissolved oxygen concentration and any other appropriate determinands relevant to ecological receptors for estuarine waters, where applicable).
- River flow and/or levels representative of the focus reach (daily gauged flow, spot flow surveys) – all relevant available records.

The concentrations/levels of selected determinands considered as important in the context of the environmental features (dissolved oxygen saturation, orthophosphate and total ammonia) will be analysed in comparison to baseline flow conditions. The purpose of the analysis is to establish whether concentrations/levels of selected determinands respond inter-annually to changes in flow.

For DP27, the relevant discharges to consider in each EAR will be provided, obtained through a data request to the Environment Agency. Only discharge permits over 0.5Ml/d will be identified for consideration in the EARs. Consideration of nutrients will also be undertaken particularly in relation to nitrogen and phosphorus. The risk assessment will also be updated to consider the most recent (2009-2023) hydrological data.

3.4.5 Summarising the potential changes in physical environment

The potential changes to the physical environment due to implementation of drought permit will be summarised in each EAR. A table summarising these impacts will be provided for each drought action, as per example action shown in **Table 3.2.**

Table 3.2: Summary of potential changes to the physical environment of the impacted reaches from implementation of the Drought Permit

River Reach (Impact)	Example Reach 1	Example Reach 2
Hydrology	Reach 1 would be flowing at natural summer rates prior to implementation of drought permit. A minor decrease in flow would be associated with a reductions in flow velocities, levels and wetted widths. This would potentially pose a threat to marginal habitats and flow sensitive aquatic biology (with parts of the reach being flow sensitive).	Reach 2 would be flowing at natural summer rates prior to drought permit implementation. The implementation of a new discharge to this reach may lead to an increase in flow that could quantitatively benefit the marginal habitats and other flow sensitive habitats in the reach.
Water quality	Potential for reduction in dilution potential from downstream discharges or reduced dissolved oxygen from reduced flow.	Discharge of poor water quality could lead to impacts on water quality and associated biology
Impact on surface water abstractions	Potential reduced flow available for downstream abstraction	Potential impact on downstream abstractions due to changes in water quality from discharge.
Impact on groundwater abstractions	Negligible	
Impact on consented discharges	Negligible	Low, localised risk in vicinity of fish farm discharge.

3.5 Identifying features likely to be affected and assessing sensitivity

The DPG 2025 requires firstly to establish whether environmental features are susceptible to drought permit impacts and secondly to establish the sensitivity of features of interest. Within the study area and considering the level of impact on the physical environment identified (see **Sections 3.3.1 and 3.4**), potentially sensitive receptors (sites / features) will be identified. This sensitivity assessment will be used as a screening exercise to identify features that should be considered for detailed assessment.

This sensitivity/screening assessment will be used to define the risk of each feature present in the hydrological reach being impacted by the drought permit during the period of its operation. The previous screening exercise establishes the study area for each drought permit together with identification of relevant, susceptible environmental features within those study areas (based on the risk of them being impacted by the drought permit during the period of its operation).

This stage fulfils the requirement of the DPG to "*Identify the key features of the environment which are likely to be affected by these changes and assess their sensitivity*." The key features that will be considered include:

- Designated biodiversity sites (Special Areas of Conservation (SACs), Special Protected Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs), landscapes including World Heritage sites, European Landscape Convention, marine conservation zones (MCZs), national parks, National Landscapes (formerly Areas of Outstanding Natural Beauty (AONB)), National Nature Reserves (NNRs), Local Nature Reserves (LNRs), non-statutory designated sites such as County Wildlife Sites (CWS) and Local Wildlife Sites (LWS) (depending on the local nomenclature),

and species of principal importance (SPI) (Section 41 of the NERC Act 2006) which are located on or within 1km of the impacted reaches or 2km from the groundwater source;

- Habitats of principal importance (HPI) (including chalk streams) which are located on or within 1km of the impacted reaches or 2km from the groundwater source;
- Where identified, Water Framework Directive (WFD) status of designated waterbodies which contain the impacted reaches[15];
- Sensitive ecological features as advised by the Environment Agency and Natural England;
- Invasive non-native species (INNS); and
- Wider features which should be taken into account in determining the potential impacts of drought action implementation – specifically other abstractors, landscape, navigation, recreation and heritage.

Details regarding the data and approaches to determine the sensitivity of each feature is provided in the sections below.

3.5.1 Internationally and nationally designated sites

The designated sites will include SACs, SPAs, Ramsar sites, SSSIs and MCZs. GIS data will be used to map the locations and boundaries of each of the designated sites in relation to the different drought management measures.

To provide an indication of those measures more likely to have an effect on Habitats site(s) (SACs, SPAs and Ramsar sites) or nationally designated sites, consideration will be been given to the relative spatial locations of the drought management measures and designated sites within the same surface water and groundwater catchments and/or estuarine system to ensure that any hydrological connectivity over a longer distance that might affect water-dependent sites, qualifying features and designated mobile species has been taken into account.

All designated sites are to be identified using a distance-based threshold of 10km. This threshold is based on the premise that Natural England's Site of Special Scientific Interest (SSSI) Impact Risk Zones (IRZ) extend out to a maximum of a 10km radius (excluding bespoke IRZs) and this was considered a robust threshold which was extended where appropriate when impact pathways were identified. Habitats Sites are to be assessed where they occur entirely or partly within the 10km threshold or where impact pathways link the action to more distant Habitats Sites, for example, those Habitats Sites that are hydrologically connected via surface or groundwater catchments. This approach is consistent with the methodology in the UK Water Industry Research (UKWIR) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*[16] which is specific to HRA but also applied to nationally designated sites for the screening process.

The data sources that will be considered include:

- Relevant citation documents;
- Conservation objectives and Supplementary Advice documents (where available) including the targets and attributes that inform favourable condition status (FCS);
- Site Improvement Plans (SACs and SPAs);
- Regulation 33 information for European Marine Sites (EMS);

[15] Under Article 22 of the WFD, the Freshwater Fish Directive (FFD) was repealed on 22 December 2013. Protected waters under the FFD are incorporated within the WFD. Ecological status defined in the WFD sets the same protection to these protected areas for fish. In the case of Salmonid waters, this is assigned a typology in WFD status classification, specifically for dissolved oxygen saturation in rivers and dissolved oxygen concentration in lakes. Salmonid waters are rivers/lakes which, in the Environment Agency's judgement, would support a sustainable fish population dominated by salmonid species; this replaces the system of notices protecting areas through the FFD.

[16] UKWIR (2021). *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*, 287p.

- Review of Consents information available from the Environment Agency;
- SSSI feature condition, site management and potential damaging operations information (from Natural England);
- Article 12 (Special Protection Areas) and Article 17 (SAC) status reports;
- Common Standards Monitoring Guidance (where specific targets have been set and agreed by Natural England and Environment Agency);
- Habitat requirements for the qualifying/monitored features (e.g. nesting, foraging, commuting) and food preferences; and
- Physical characteristics of the habitats and environment influencing them.

The existing DP27 HRA Technical Report (SEA Environmental Report Annex 4: Appendix O; 100125254-MM-RP-HRA-014-A) should be reviewed to ensure that potential effects on European sites have been detailed. It is anticipated that the above data sources have been used and a comprehensive assessment of each Drought Plan action is already available. However, it is possible that in the intervening period since the HRA's production, there are changes which affect the conclusions made. The identification of the study area for each action may also affect the conclusions provided within the HRA.

Where required, baseline data obtained though the Environment Agency, Natural England, Biological Record Centres and SBB monitoring programmes will be used to supplement the data sources listed above to further inform the presence and/or distribution of qualifying features with the study area associated with each drought management measure. The presence/absence of a feature within the study area will affect sensitivity to each drought management measure.

The data and data sources that will inform the screening of sensitive features will be listed with each EAR and along with a description of the perceived sensitivity to drought management measure. This information will also be used to define the confidence of the sensitivity assessment.

Where features are considered to have a high or medium sensitivity to drought actions, the communities will be considered for further assessment. Internationally or nationally designated sites will also be considered for detailed assessment where a low sensitivity has been identified.

3.5.2 Other designated sites

GIS will be used to identify any other designated sites (statutory or non-statutory including NNRs, CWS, LNR, LWS), and HPIs, within each hydrological reach. Sites that are hydrologically connected or within 1km of the study area will be considered for screening. This screening exercise was undertaken for the previous DP 2022 and will be updated accordingly. Groundwater Dependent Terrestrial Ecosystem (GWDTEs) within the cone of depression will be considered in line with UK TAG Guidance on the identification and risk assessment of groundwater-dependent terrestrial ecosystems[17]. Defra GWDTE data will be used to identify these features.

Where designated sites are identified as associated with a drought action, the site citation will be reviewed to confirm any features (habitats or species) that are considered sensitive to each drought action. The baseline review to inform screening and the scope of the assessment will require available data from the Environment Agency, Natural England and other relevant organisations. Data will include:

- The condition of the habitat and species composition;
- Mapping of areas of priority habitats; and
- Information on the sensitivity of habitats to surface water flows and levels e.g. water level management plans.

[17] UKTAG (2004) *Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems*. UK Technical Advisory. Available at: https://www.wfduk.org/resources%20/risk-assessment-groundwater-dependent-terrestrial-ecosystems.

These data will be obtained through data request to the Environment Agency, Natural England and Local Biological Record Centres where required.

The data and data sources that will inform the screening of sensitive features will be listed with each EAR, along with a description of the perceived sensitivity to drought management measure. This information will also be used to define the confidence of the sensitivity assessment.

Where features are considered to have a **high** or **medium** sensitivity to drought management actions, for the need for further assessment will be reviewed. Sites that are not internationally or nationally designated will **not** be considered for further assessment where a low sensitivity is identified.

3.5.3 Protected species

The sensitivity to drought action impacts of the species that are protected under European or UK legislation, considered as principle for conserving biodiversity or are considered as threatened or endangered will be considered.

This includes species listed under Annex IV of the Habitats Directive, SPIs (Section 41 of the NERC Act (2006)), species that are protected under the Wildlife and Countryside Act (1981), species listed on the IUCN Red List of threatened species, and the priority fish species listed in Appendix 3 of the DPG 2025 that are located within 1km of the study area.

The distribution, status and abundances of the protected species within the study area of each drought management action will be informed by considering 10 years of baseline data (where available) for hydrological reaches identified. Where impacts are similar hydrological reaches will be merged to avoid repetition. This is in line with the DPG requirements for considering long-term data. Where available, data from periods representing droughts or extreme low flow conditions will also be considered. The distribution, status and abundances of the protected species will be informed by open-source data, data collated from Environment Agency, Natural England, SBB and, where available, other third-party monitoring programmes and data requested from Local Record Centres. The distribution, status and abundances of the protected species with the study area of each drought action will be reviewed by considering baseline data for each hydrological reach identified.

Where aquatic or semi-aquatic protected species are identified upstream or downstream of a particular hydrological reach, but not in the reach, a precautionary approach will be adopted, and it will be assumed that these species are present. The ecology of each water-dependent species will be considered to inform the sensitivity to drought actions. This will include information collated from literature (e.g. Conserving Natura 2000 Rivers Ecology Series) and professional judgement.

Where species are considered to have a **high** or **medium** sensitivity to drought actions, the communities will be considered for further assessment. Species that are protected under European of Uk legislation will also be considered for further assessment where a **low** sensitivity has been identified.

The baseline data will consider the most recent data available, in line with the DPG 2025 requirements for considering long-term data. If this data has been obtained from targeted surveys, the location(s), dates and number of surveys completed will all be used to conclude a level of confidence with regards to the sensitivity assessment.

3.5.4 Diatoms/phytobenthos

For DP27, the sensitivity analysis will consider the relationship between diatom communities and the supporting environmental variables. The purpose of the analysis is to establish how these receptors respond to changes in water quality, particularly nutrient levels, if applicable to the specific action; diatoms are not considered to be sensitive to changes in flows. This sensitivity assessment will consider 10 years of baseline data. Where appropriate, longer-term datasets will be incorporated if the 10-year data set does not provide enough information on trends. This is in line with the DPG 2025 requirements for considering long-term data. Where available, data from periods representing droughts or extreme low

flow conditions will also be considered. The Environment Agency Ecology & Fish Data Explorer[18] database will be used where data is available.

The location of the survey sites that informed the baseline conditions, the number of surveys completed at each survey site and the dates when surveys were undertaken will be provided. This information will be used to define the confidence of the sensitivity assessment.

The biological indices and metrics that will be considered includes the following[19]:

- TDI 4 scores which ranges from 1 (indicating a preference for extremely low nutrient levels) to 100 (indicating a preference for extremely high nutrient levels).
- % Motile which provides an indication of the percentage of the motile diatoms in the sample.
- % Organic Tolerant which provides an indication of the percentage of organic pollution tolerant diatoms in the sample.
- % Saline which provides an indication of the percentage of diatoms tolerant of slightly saline waters.

The biological indices and metrics identified above will be used to establish the baseline conditions and variability within the diatom community outside the drought action conditions. The TDI4 scores for each site will be plotted against water quality (in particular soluble phosphorus) to identify any trends in community structure during low flow conditions. It is noted that there are limitations to the use of the metrics listed above in high alkalinity rivers. Such limitations will be identified in the confidence assessment of the data.

Where diatom communities are considered to have a **high** or **medium** sensitivity to drought management actions, the communities will be considered for further assessment. The diatom community will also be considered for further assessment where the community is associated with designated sites or where there is low confidence in the baseline data used to inform the assessment. The assessment will consider the risk of alteration to community composition, for example, as a result of changes to the flow and/or velocity and water quality as a result of a particular drought order or permit. The assessment of sensitivity will also be used to inform the scope of the impact assessment for the macrophyte community.

3.5.5 Macrophyte community

For DP27, the sensitivity analysis will consider the relationship between macrophyte communities and the supporting environmental variables. The purpose of the analysis is to establish how these receptors respond to changes in flow and associated environmental variables including water quality and nutrient levels. This sensitivity assessment will consider existing data from the last 10 years, where available. Where appropriate, longer-term datasets will be incorporated if the 10-year dataset does not provide enough information on trends. This is in line with the DPG 2025 requirements for considering long-term data. Where available, data from periods representing droughts or extreme low flow conditions will also be considered.

Naturally intermittent or temporary reaches will be assessed separately from perennial reaches, as this approach is preferable when sufficient data is available and will be considered as part of the assessment process.

The location of the survey sites that informed the baseline conditions, the number of surveys completed at each survey site and the dates when surveys were undertaken will be provided. This will include all species recorded during surveys, both terrestrial and aquatic, where data is available – focusing not only on presence or absence but also on percentage cover changes and cover band values, particularly for

[18] Environment Agency Ecology & Fish Data Explorer. Available at: https://environment.data.gov.uk/ecology/explorer/

[19] Kelly MG, Juggins S, Bennion H, Burgess A, Yallop M, Hirst H, Jamieson J, Guthrie R and Rippey B. DARLEQ: Diatom Assessment of River and Lake Ecological Quality Version 2.0 User Guide.

groundwater-dependent species and habitats. This information will be used to define the confidence of the sensitivity assessment.

The biological indices and metrics that will be considered includes the following[20]:

- River Macrophyte Nutrient Index (RMNI) derived from the RMNI scores of the taxa from surveys. High scores are associated with species that dominate under enriched conditions.
- Number of macrophyte taxa (NTAXA) the number of truly aquatic scoring taxa recorded during surveys.
- Number of functional groups (NFG) fully aquatic taxa are allocated to 24 functional groups.
- Cover of green filamentous algae (ALG) percentage cover over the whole of the survey section of river.

The biological indices and metrics identified above will be used to establish the baseline conditions and variability within the macrophyte community outside the drought action conditions. The expected scores for each index for each of the sample sites will be generated via the LEAFPACS2 calculator, using environmental base data provided obtained from the Environment Agency's Ecology and Fish Data Explorer. The Observed (O), also obtained from the environment Agency's Ecology and Fish Data Explorer will then be divided by the Expected (E) to produce a O:E ratio which will then be assessed against WFD standards and relevant thresholds.

The O:E indices will then be plotted against flow to identify any hydrologically driven patterns. Care will be taken to avoid using periods in the baseline analysis within which a drought action may have been in operation. The sensitivity of the macrophyte community to the changes in the physical environment as a result of drought management actions will be determined and will be informed by considering the RMNI EQR in the context of water quality (in particular soluble phosphorus).

It is noted that the River Macrophyte Hydraulic Index (RMHI) which is based on substrate, depth and stream energy, was dropped from the suite of metrics used for classification. However, as the metric scores are available from Environment Agency's Ecology and Fish Data Explorer, these scores will also be plotted against flow to identify any hydrologically driven patterns in years subsequent to low flow conditions.

It is noted that the impacts on macrophyte communities should not be considered in the context of the metrics and indices alone. Species data to identify species that are particularly sensitive to flow change outside of the main macrophyte growing season will also need to be considered, particularly where there are protected species and/or habitats of principal importance. As such, species level data will also be obtained from the Environment Agency's Ecology and Fish Data Explorer for consideration in the sensitivity assessment.

Where macrophytes communities are considered to have a **high** or **medium** sensitivity to drought management actions, the communities will be considered for further assessment. The assessment will consider the risk of alteration to community composition as a result of the implementation of a drought permit or drought order. This includes, for example, changes in community composition as result of changes to the flow and/or velocity and water quality, the reduction in growth as a result of impacts on water levels and flows, etc.

Terrestrial encroachment and the presence of terrestrial species will be reviewed regardless of drought sensitivity. This is because, even if a site maintains an aquatic community, a reduction in wetted width can confine it to a much narrower channel, influencing the overall ecological dynamics. This factor will be assessed wherever adequate information is available.

[20] WFD-UKTAG (2014) River Assessment Method Macrophytes and Phytobenthos. Macrophytes (River LEnvironment AgencyFPACS2).

The macrophyte community will also be considered for further assessment where the community is associated with designated sites or where there is low confidence in the baseline data used to inform the assessment. The assessment of sensitivity will also be used to inform the scope of the impact assessment for the macrophyte community.

3.5.6 Macroinvertebrate community

The sensitivity of the macroinvertebrate communities associated with each drought management action will be informed by considering existing data from the last 10 years, for each affected hydrological reach identified. Where appropriate, longer-term datasets will be incorporated if the 10-year data set does not provide enough information on trends. This is in line with the DPG 2025 requirements for considering long-term data. Where available, data from periods representing droughts or extreme low flow conditions will also be considered. The DPG 2025 also require the consideration of available macroinvertebrate data analysis tools. These may include the HE Toolkit, Environment Agency Hydroecological Validation (HEV) tool and Hydroecological Modelling (HEM) tool.

The sensitivity analysis will consider the relationship between macroinvertebrate communities and the supporting environmental variables over the 10-year period. The purpose of the analysis is to establish how these receptors respond to changes in flow and associated environmental variables including water quality and habitat availability.

The data (metrics, indices and diversity data) to inform the sensitivity of the macroinvertebrate community associated with each drought management will be obtained through the Environment Agency's Ecology and Fish Data Explorer[21]. The data search will include all records collected in the last 11 years. Where available, these data will be supplemented by other sources including the baseline monitoring programme and data collated from other SBB monitoring programmes (e.g. AMP7 and AMP8 WINEP investigations etc).

The location of the survey sites that informed the baseline conditions, the number of surveys completed at each survey site and the dates when surveys were undertaken will be provided. This information will be used to define the confidence of the sensitivity assessment.

The biological indices and metrics that will be considered includes the following:

- WHPT (Whalley Hawkes Paisley Trigg) indices: WHPT was introduced as the basis for the UK's river macroinvertebrate status classification under the Water Framework Directive for River Basin Management Plan 2[22]. It replaces the Biological Monitoring Working Party (BMWP) scoring system and provides updated taxon scores related to susceptibility to pollution, with the most susceptible family scoring the highest. The total abundance of individuals found within each family is also considered and will adjust the respective score. Typically, with pollution tolerant families the score is adjusted down when high abundance is present, and the score is adjusted up when low abundance is present. The opposite is true of families which are considered susceptible to pollution. Two further indices are derived, Average Score Per Taxon (ASPT) and Number of Scoring Taxa (NST). By dividing the WHPT score by the NST in the sample ASPT is calculated. The ASPT score is considered less sensitive to differences in sampling effort than the WHPT index alone and therefore provides a more reliable means of assessing biological quality.
- Lotic-invertebrate Index for Flow Evaluation (LIFE): LIFE is a method for linking macroinvertebrate data to prevailing flow regimes. This is an index designed for British Waters and is described in Extence et al., 1999[23]. It may be calculated either at the family level or at the species level. The index is calculated by assigning each taxon to one of 6 groups ranging from a group primarily

[21] Environment Agency Ecology & Fish Data Explorer. Available at: https://environment.data.gov.uk/ecology/explorer

[22] WFD-UKTAG (2014) River Assessment Method for Benthic Invertebrate Fauna, Invertebrates (General Degradation): Whalley, Hawkes, Paisley & Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT).

[23] Extence C, Balbi D and Chadd R (1999) *River Flow Indexing Using British Benthic Macroinvertebrates: A Framework for Setting Hydroecological Objectives*. Regulated Rivers Research & Management 15(6):545-574

associated with rapid flows to a group holding forms frequently associated with drying or drought impacted sites.

- Proportion of Sediment-sensitive Invertebrates (PSI): the PSI index (Glendell et al. 2011[24]) is an index which measures the abundance-weighted percentage frequency of taxa which are sensitive to fine sediment deposition and will be used to assess the sensitivity of the macroinvertebrate community to changes in geomorphology.
- DEHLI (Drought Effect of Habitat Loss on Invertebrates)[25] index is a biomonitoring tool designed to assess the impact of flow intermittency on macroinvertebrate communities in aquatic ecosystems. It evaluates how habitat loss due to drought conditions affects invertebrate populations by assigning scores to taxa based on their association with different stages of channel drying. This index helps in understanding ecological responses to drying events and is particularly useful for monitoring intermittent or temporary rivers.

The biological indices and metrics identified above will be used to establish the baseline conditions and natural variability within the macroinvertebrate community outside the drought action conditions. The expected scores for each index for each of the sample sites will be generated via River Invertebrate Classification Tool (RICT) for each sampling season, using environmental base data provided obtained from the Environment Agency's Ecology and Fish Data Explorer. The sensitivity of the macroinvertebrate community to environmental changes caused by drought management actions will be determined and informed by the 3-month seasonal hydrological summary for the associated catchment, as provided by the UK Centre for Ecology and Hydrology (UKCEH). Seasonally variability will be taken into account as well as daily flows where necessary.

Where macroinvertebrate communities are considered to have a **high** or **medium** sensitivity to drought management actions, the communities will be considered for further assessment. The macroinvertebrate community will also be considered for further assessment where the community is associated with designated sites or where there is low confidence in the baseline data used to inform the assessment. The assessment of sensitivity will also be used to inform the scope of the impact assessment for the macroinvertebrate community. The assessments of the macroinvertebrate community will consider a range of potential changes to the community structure (depending on the impacts on the physical environment). This could include, for example, the risk of a reduction in species diversity as a result of the loss of flow-sensitive taxa, the risk of a loss of marginal habitats and reduction in abundance and distribution of species utilising such habitats, the reduction in species diversity as a result of sedimentation, etc.

It is noted that the impacts on macroinvertebrate communities should not be considered in the context of the metrics and indices alone. Species data to identify species that are particularly sensitive to flow change some of which may be of conservation importance will also need to be considered. As such, species level data will also be obtained from the Environment Agency's Ecology and Fish Data Explorer for consideration in the sensitivity assessment.

3.5.7 Fish community

For DP27, the baseline data (indices and diversity data) will be used inform the sensitivity of the fish community associated with the study area for each drought action. This and will be updated to incorporate the most recent data available from the last 10 years. Where appropriate, longer-term datasets will be incorporated if the 10-year data set does not provide enough information on trends. This is in line with the DPG requirements for considering long-term data. Where available, data from periods representing droughts or extreme low flow conditions will also be considered.

[24] Glendell M, Extence C, Chadd R and Brazier R (2014) *Testing the pressure-specific invertebrate index (PSI) as a tool for determining ecological relevant targets for reducing sedimentation in streams.* Freshwater Biology 59(2)

[25] Chadd, R. P., England, J. A., Constable, D., Dunbar, M. J., Extence, C. A., Leeming, D. J., Murray-Bligh Wood J.A., P. J. (2017) *An index to track the ecological effects of drought development and recovery on riverine invertebrate communities*. Ecological Indicators, 82, 344-356.

This should include the risk to delayed/restricted migration, loss of habitat (in particular salmonid spawning or nursery habitat), fish stranding, fish distress leading to disease outbreaks, fish kills, transfer of invasive non-native species, and impacts on angling (for example, closure of fisheries and/or cancellation of fishing events). The analysis should also consider the importance of the study area as a migratory pathway for diadromous fish species and spawning and nursery habitat for protected and notable species.

Data will be obtained through the resources provided by the Environment Agency and Natural England Specifically, the Ecology and Fish Data Explorer[26] and Environment Agency Fisheries Classification Scheme 2 (FCS2) data will be considered alongside local Natural England teams' datasets. The FCS2 data includes individual species ecological quality ratio (EQR), a site EQR and a Water Body EQR. The individual species EQR is interpreted as the probability of observing the number of individuals which were observed, or less, if the site were at reference conditions. The site EQR combines the probabilities obtained for each individual species and the Water Body takes all the Site EQRs relevant to that Water Body and calculates a mean for the Water Body. The data collected through fish population surveys will also be used to further inform the species and life stages to consider in the impact.

Where available, these data will be supplemented by other sources including SBB's baseline monitoring programme and data collated from other SBB monitoring programmes (e.g. AMP7 and AMP9 WINEP investigations etc). Where applicable, the assessment of salmon stocks and fisheries in England and the relevant Conservation Limits (the minimum desirable spawning stock levels, below which stocks should not fall) will also be considered in the assessment along with the distribution of rivers considered as principal to the protection of salmon, sea trout, brown trout and coarse fisheries. The location of the survey sites that informed the baseline conditions, the number of surveys completed at each survey site and the dates when surveys were undertaken will be provided. This information will be used to define the confidence of the sensitivity assessment. If no data is available, targeted surveys should be undertaken (for 3 years in compliance with EA guidance) and continue into the monitoring period.

Where fish communities are considered to have a **high** or **medium** sensitivity to drought management actions, the communities will be considered for further assessment. A precautionary approach will be applied to reaches with low confidence in the baseline data. For fish communities, further assessment will be undertaken if they are associated with designated sites or where there is low confidence in the baseline data used to inform the assessment. Additionally, the assessment of sensitivity will also be used to inform the scope of the impact assessment for the fish community.

3.5.8 Invasive non-native species (INNS)

INNS is considered a key risk within the SBB region. As such, detailed information on INNS risks and monitoring requirements are needed as part of the EAR process.

Aquatic and riparian INNS can cause significant adverse social, economic and environmental impacts, and can cause the ecological status of WFD water bodies or protected sites to deteriorate or not achieve their ecological objectives. If a drought management action causes the spread of INNS, the operator may be at risk of committing an offence under the Wildlife and Countryside Act 1981 (if species are listed in Schedule 9), or under other relevant legislation (a list is provided by the GB Non-Native Species Secretariat (GB NNSS)[27]).

INNS risk assessments will be undertaken to assess whether drought actions increase the risk of INNS spreading, or could increase the environmental impacts from INNS already present. These risk assessments will consider new and existing INNS pathways, baseline data on INNS distribution, and potential INNS population responses to physical habitat changes.

[26] Environment Agency Ecology & Fish Data Explorer. Available at: https://environment.data.gov.uk/ecology/explorer

[27] GB NNSS (2026a) *Legislation*. Available from: https://www.nonnativespecies.org/legislation/

Where available, the most recent 10 years of baseline INNS data for each relevant river reach or surface water body will be considered within the risk assessments. Relevant data collected or collated by the Environment Agency, SBB, or relevant third parties, will be included. This will include open-source data available from NBN, and any data gathered from local records centres. The internal SBB INNS team will be contacted to share any available data for a specific site. A monitoring programme to provide an understanding of INNS distribution at the time of implementing a supply action, will be designed. The requirements of an EMP, which should include INNS, is discussed in **Section 4**.

These data sources will be reviewed for species listed in Schedule 9 of the Wildlife and Countryside Act 1981 and Schedule 2 of The Invasive Alien Species (Enforcement and Permitting) Order 2019, Species of Special Concern[28], and the WFD classification of aquatic alien species[29]. Furthermore, fish records from these data sources will be screened to identify locally non-native species[30], so that the potential risk of their spread can be assessed.

As described in the supplementary guidance on the Environmental Assessment for Water Company Drought Planning[1], drought actions which involve the creation of a new permanent raw water transfer pathway are subject to the Environment Agency's Raw Water Transfer Position Statement[31]. In such cases, the risk assessment function within the Environment Agency's Strategic Resource Option (SRO) Aquatic INNS Risk Assessment Tool (SAI-RAT) v2.01[32] will be used as appropriate to quantify the risk of INNS transfer.

As also prescribed in the supplementary guidance[1], the risk of spread of current INNS from temporary raw water transfers (temporary infrastructure and operating for a maximum of a few weeks) and temporary changes to movement of water within the existing network will also be considered. Temporary raw water transfers will also be assessed using the risk assessment function within SAI-RAT, as appropriate.

Temporary changes within the existing network will consider INNS distribution at the time of drought action implementation, and likely ecological responses. Where a drought action may affect INNS through changes in flow velocity, wetted area or water depth, the INNS Response Module (IRM) within SAI-RAT v2.01 will be used to indicate potential population responses. Any associated assessments such as hydraulic or hydrological modelling will be used to indicate the magnitude, extent and duration of physical impacts, so that the scale of INNS responses can be predicted. Similarly, any associated water quality assessments (for example as undertaken to inform WFD) will be used to infer potential species responses.

The INNS risk assessments will also consider existing risk assessments available through the GB NNSS[33] which have been undertaken for a number of species and include information on UK distribution, mechanisms of spread, and management.

Where INNS proliferation or spread as a result of a drought action could affect other ecological features, these effects will be evaluated within the relevant assessment types (e.g. HRA, WFD) as appropriate. A Rapid Response Plan would be set up by the SBB INNS team to ensure quick action. The SBB Water

[28] GB NNSS (2026b) *Species of Special Concern*. Available from: https://www.nonnativespecies.org/legislation/species-of-special-concern#List

[29] WFD UKTAG (2021) *Classification of aquatic alien species according to their level of impact*. Available from: https://www.wfduk.org/sites/default/files/UKTAG%20classification%20of%20alien%20species%20working%20paper%20v8.pdf

[30] WFD UKTAG (2026) *Aquatic alien species and the WFD: Proposed list of 'locally absent' species and guidance on its interpretation.* Available from: https://www.wfduk.org/sites/default/files/Media/Environmental%20standards/Locally%20non-native%20species%20-%20revised%20September%202016.pdf

[31] Environment Agency (2022) *Managing the risk of spread of INNS through raw water transfers*.

[32] APEM (2024) *SRO Aquatic INNS Risk Assessment Tool (SAI-RAT)*. Version 2 Guidebook.

[33] NNSS (2026) *Risk assessment*. Available from: https://www.nonnativespecies.org/non-native-species/risk-analysis/risk-assessment#Riskassessments.

Resources team will be involved in this process. As such, the results of INNS risk assessments may inform these other assessment types.

3.5.9 Other users

The DPG 2025 requires water companies to demonstrate that, in addition to environmental features, the implications of drought management actions on elements/features such as aesthetics, recreation, navigation, archaeology and heritage has also been considered.

To inform the sensitivity assessment (screening), a GIS-based analyses of the geographical location of elements/feature in relation to each particular study area should be undertaken to identify elements/features that are directly and indirectly associated with the drought actions. The SEA for the DP27 has already been undertaken which meets these needs, with the results presented in the SEA Environmental Report which accompanies the Drought Plan.

The elements/features that were considered in the SEA included:

- Impacts on the recreational use of waterbodies;
- Impacts on landscape character and amenity;
- Impacts on sites of archaeology and cultural heritage importance; and
- Impacts on waterbodies used for navigation.

In addition, the data obtained from the Environment Agency on other abstractors (where available) (see **Section 3.4.4**) should also be considered to determine the risk to other consumptive and non-consumptive abstractors in each hydrological reach.

3.5.10 Assessing sensitivity

The DPG 2025 states that, to assess environmental sensitivity you need good quality, long-term environmental datasets. This is because long-term datasets are more likely to cover different flow conditions, including drought events, which will help improve the understanding of how the environment within the study area responds to changing flow/level conditions. They can also help filter out some of the short-term fluctuations in the data. Furthermore, where modelling tools are available, this could also be applied to help understand the relationship between flows/levels and ecology and assess environmental sensitivity. If no data is available, targeted surveys should be undertaken (for 3 years in compliance with EA guidance) and continue into the monitoring period.

The sensitivity of the environmental receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. To help quantify sensitivity the following factors for ecological receptors could be considered:

- Resistance (ability to remain unchanged by disturbance)
- Redundancy (ability to avoid critical impairment (e.g. in ecosystem functioning) despite undergoing change)
- Recovery capacity (ability to recover to baseline/avoid irreversible change)
- Recovery rate/resilience (time this recovery takes)
- Conservation value of ecological receptors.

Therefore, for SBB's DP27, the sensitivity of the environmental features will be assessed using the most recent baseline data.

Use of the HE Toolkit will be considered on a case-by-case basis depending on factors such as data availability, and the additional value it would add.

The sensitivity of environmental receptors will be categorised as follows:

- High
- Medium
- Low
- Not sensitive
- Uncertain.

Where features are considered to have a medium or high sensitivity to drought actions, these will be considered for detailed assessment. The exception will be sites and features that are considered to be of national or international importance. In such cases, features will also be considered for detailed assessment where a low sensitivity has been identified.

The outcomes of the screening and sensitivity assessment will be tabulated. The tables in each EAR will be periodically reviewed, and the sensitivity analysis will be updated in consideration of updated baseline data.

3.6 Predicting likely environmental impacts

3.6.1 Impacts on habitats and species

Where screening of the drought actions has identified that a sensitive ecological receptor is present within the study area of the drought action and that receptor is sensitive to impacts of the drought management action specifically, the potential impact is to be investigated.

The investigation will consider the impacts of the changes in flows, water quality and geomorphology as a result of the drought management action, and the consequent impacts on the ecological receptor(s). Potential effects could be associated with one or more of the following: a direct reduction in river levels and/or flows; a deterioration in water quality; or secondary effects of reduced flow velocity (for example on sediment characteristics).

In order to define the potential impacts on habitats and species in a readily understandable manner, a series of criteria have been defined using both the Chartered Institute of Ecological and Environmental Management (CIEEM) Ecological Impact Assessment (EcIA) 2018[34] guidance and the Environment Agency's DPG 2025.

It is important to note that the two pieces of guidance differ in their approach to assigning a significance value.

The CIEEM guidance 2018 advises that the determination should consider whether a given impact will be ecologically significant or not at the geographic level of value assigned to that receptor. This means that the level of significance cannot be higher than that geographic value. It is sometimes possible that an impact may not be significant at the receptor's given level of value due to its low magnitude, duration, etc., but may be significant at a lower geographic scale. For example, the effects of an impact on a species of county value may not be discernible or significant at the county scale but may be felt at the district scale.

However, the DPG 2025 advocates the categorisation of the likely environmental impacts of drought management actions over time (short, medium and long-term) and throughout the year of the action, as either major, moderate, minor or uncertain.

Therefore, a combination of the two guidelines will be used for the assessments; CIEEM guidance for valuing and characterising the impacts, and the Environment Agency Drought Plan Guidance for assessing sensitivity, magnitude and providing an overall significance rating.

[34] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1*. Chartered Institute of Ecology and Environmental Management, Winchester. Updated September 2019

To do this, two key formulae will be used as follows:

- Impact Significance = Value x Effect Magnitude
- Effect Magnitude = Timing (summer or winter) x Scale (extent of impact) x Duration (short term or long term).

3.6.2 Impact Significance

Value of the Ecological Receptor

When assigning a value, consideration is given to abundance, range and geographical distribution, and historic trends (e.g. if a species is rare and population is in decline). It is important to note that there is a difference between the legislative and conservation status of an ecological receptor i.e. although a species may be identified as an Annex II species, unless the population is contained within a SAC, it is unlikely to warrant an international value. The approach to valuing ecological receptors is detailed in **Table 3.3**.

Table 3.3: Value of Ecological Receptors

Ecological Value	Example
International	An internationally designated site or candidate site, i.e. a SPA, proposed SPA (pSPA), SAC, candidate SAC (cSAC), Ramsar site, or an area which would meet the published selection criteria for such designation. Other significant areas of Annex I priority habitats[35] listed in the Habitats Directive, the loss of which would significantly change the overall range and area at the European scale in the long term. Internationally significant populations of European Protected Species (Annex IV), Annex II species[36], or species otherwise formally deemed to be rare and threatened in Europe or globally (e.g. IUCN 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the European scale.
National	A nationally designated site, i.e. SSSI, National Nature Reserve (NNR) or discrete area which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the national scale in the long term. A nationally designated site, i.e. SSSI, National Nature Reserve (NNR) or discrete area which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the national scale in the long term. a Nationally significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the national scale.
Regional	A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of

[35] A sub-set of the Annex I habitat types are defined as being 'priority' because they are considered to be particularly vulnerable and are mainly, or exclusively, found within the European Union (Article 1d). Of the 76 Annex I habitat types that are known to occur in mainland UK, 23 are defined as priority habitat types

[36] Annex II lists 788 species, of which 61 have been recorded in the UK (excluding Gibraltar) since 1900. A sub-set of Annex II species considered to be particularly rare or endangered are defined as 'priority species'. Only one of these, a liverwort, is known to currently occur as a native in the UK.

Ecological Value	Example
	which would significantly change the overall range and area of that habitat within region in the long term. Regionally significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) in the SBB region.
County	Sites formally recognised by local authorities, e.g. County Wildlife Sites (CWS) or Local Wildlife Sites (LWS), or considered to meet published ecological selection criteria for such designation. A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the county/metropolitan scale in the long term. A significant area of key habitat identified in any County/Metropolitan biodiversity and or conservation plans. Significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the metropolitan scale. Significant and viable populations of other species identified as metropolitan priorities in any County/Metropolitan biodiversity and or conservation plans.
District	Sites formally recognised by local authorities, e.g. Sites of Borough Importance for Nature Conservation (SINC) (Borough / Local SINC) or considered to meet published ecological selection criteria for such designation. A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the greater District / Borough scale in the long term. A significant and viable area of habitat identified in any District biodiversity or conservation plan. Significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) in any District biodiversity or conservation plan.
Parish (local)	Semi-natural habitats or species, listed on any of the above-mentioned priority lists, that appreciably enrich District / Borough biodiversity, but which are not in themselves of District / Borough importance.
Site (within focus reach only)	Areas of habitat and/or species populations of limited ecological importance due to their size, species composition or lack of threat/rarity. The loss of such features would have no discernible impact on the species'/habitat's overall range and conservation status at any administrative scale in the long term.

3.6.3 Magnitude of the impact on habitat or species

The implementation of the drought action, and the resulting changes in the physical environment, could affect habitat quality, population/community status, breeding or migration potential. The following characteristics will, therefore, be considered in determining the impact:

- **Positive or Negative Impact** – all impacts are considered to be negative unless otherwise stated in the feature assessment.
- **Extent** – the extent of the impact is the spatial or geographical area over which the impact may occur.

- **Magnitude** (outlined in **Table 3.4** below) – the magnitude of the impact looks to define the potential change in WFD status/change in size, amount, volume of the ecological receptor (quantified where possible e.g. % of habitat lost, % of population subject to decline). [Note, this is different to the overall magnitude value produced using the Drought Plan Guidance 2016].
- **Duration** – the duration of impact is considered to be for 6 months, which is the duration for which a drought permit/order is implemented, unless otherwise stated. However, it is noted that the impact duration should also consider the individual receptor for context, as a 6-month period of implementation could have a much longer impact on certain features. As and indicative guide for this assessment,
    - for species:
        - short-term is up to one season (e.g. migration, spawning, flowering and univoltine life cycles associated with fly life, etc.) – as a rough guide, 6 months to a year for fauna;
        - medium-term is up to one typical reproductive lifespan (in the wild). This varies greatly depending on species, but generally anything from one year to 5 years as a rough guide for fauna;
        - long-term is over several (species) generations; and
        - permanent is where no reasonable chance of recovery/restoration is evident within the foreseeable future.
    - for habitats:
        - short-term is the typical regrowth period for many submerged macrophytes, grass and herb communities;
        - medium term is the typical regrowth period for many slower growing aquatic macrophytes, a reed bed, shrub and hedge communities;
        - long-term is the typical regrowth period for riparian trees and woodland communities[37]; and
        - permanent is where no reasonable chance of recovery/restoration is evident within the foreseeable future.
- **Reversibility** – all impacts are considered to be reversible unless the duration is considered to be permanent, as per the above. A reversible impact is one:
    - from which spontaneous/natural recovery is possible; or
    - for which effective mitigation is both possible and an enforceable commitment to this can, in theory, be made.
- **Timing and Frequency** – the drought permit/order could be implemented at any point in the year (unless otherwise statement in the assessment), however the different life stages of the ecological species are taken into account to identify specific sensitive periods. The assessment is based on the operation of a single drought permit for a period of 6 months, with subsequent applications for a drought permit required to consider cumulative effects of multiple drought permits implemented simultaneously.
- **Probability** – all impacts are considered to be probable, unless otherwise stated.

[37] This excludes ancient woodland and veteran trees which, if lost, represent a permanent impact.

Table 3.4: Magnitude of impact on ecological receptors

Magnitude of Impact	Description
High	There is a long-term large-scale (i.e. in relation to the size/distribution of the ecological receptor) change in the ecological receptor and/or changes in the overall viability of the ecological receptor.
Medium	There is a short-term large-scale change or long-term short-scale (i.e. in relation to the size/distribution of the ecological receptor) change in the ecological receptor, however no changes in the overall viability of the ecological receptor.
Low	There is a short-term small-scale change in the ecological receptor, but its overall viability is not impacted.
Negligible	No perceptible change in the ecological receptor.

There is little supporting information in the DPG 2025 to understand exactly how to interpret the overall magnitude and impact significance value. For the purpose of the environmental assessments that will inform SBB's DP27, the significance of the impact will be determined using the approach as outlined in **Table 3.5** below.

Table 3.5: Significance of Impact on habitat or species

	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible**
International	Significant	Significant	Moderate	Negligible
National	Significant	Moderate	Moderate	Negligible
Regional	Moderate	Moderate	Minor	Negligible
County	Moderate	Minor	Minor	Negligible
Local	Minor	Minor	Negligible	Negligible
Site	Minor	Negligible	Negligible	Negligible

3.6.4 Uncertainty

As required in the DPG 2025, the impacts identified will be used to identify:

- Environmental monitoring that will be carried out to support and ground-truth environmental assessments (including in-drought and post-drought recovery monitoring); and
- The level of confidence in the assessment of the likely environmental impacts of drought management actions and how uncertainty will be reduced.

A level of confidence (low, medium or high) will be allocated to the environmental assessments. Justification for this will be based on the quality of datasets, evidence, and analysis methods used to inform the assessment.

For DP27, an impact assessment will be undertaken in consideration of the updated baseline data, to identify sensitivity to drought actions. Monitoring and mitigation requirements will be produced to reflect these assessments. Monitoring and mitigation impacts will only be considered where impacts are considered to be moderate or significant (expect for internationally and nationally protected habitats and species where monitoring and mitigation will also be specified where a low impact has been identified). Please refer to **Sections 3.7 and 4** for details on mitigation and monitoring.

3.6.5 Resources and level of effort

A high level of effort and resources will be taken for actions that are expected to have higher impacts. Decisions regarding the level of effort or resources allocated to environmental assessments for each

supply-side action must be clearly justified. This is particularly important when reducing the effort or resources or implementing a phased approach for significant actions aimed at delaying or avoiding the need for emergency restrictions.

3.6.6 Impacts on WFD status/regulations

The DPG 2025 requires SBB to consider the implications of drought actions on all water bodies affected and for all relevant classification elements, particularly if a risk to WFD compliance (temporary or otherwise) is likely to occur. Where a risk to WFD compliance is likely to occur as a result of a drought action, the drought plan should clearly set out what this will be and how it will be avoided, reduced or mitigated.

Deterioration is a drop-in status class of any element set out in Annex V of the WFD, irrespective of whether this causes a deterioration in status of the water body overall. Where an element is already in the lowest class, any deterioration of that element would constitute a deterioration of the status, i.e. where an element is in its lowest status class (bad), no further deterioration of that element is allowed. Where a two-status classification is used, this also applies to the lower class. WFD also considers the risk of preventing the water bodies from reaching their future objectives. If an action could lead to a deterioration and/or prevention of reaching future objectives then this is considered to be a risk to WFD compliance. Potential WFD deterioration in status should be discussed and agreed with SBB.

Initial WFD assessments of the DP27 actions have been undertaken, as presented in the SEA Environmental Report, Annex 4: Appendix P – WFD Assessment Technical Report. This should be referred to as a starting point for the EARs. Through the more detailed assessments in the EARs, the impacts of drought actions on all water bodies affected and for all relevant classification elements (e.g. fish, aquatic macroinvertebrates, GWDTEs etc.) will be identified. Where there is potential risk to WFD compliance this will be documented in the EAR, specifically noting the relevant drought permit(s), water body and the classification element at risk. The EAR will also identify the range of mitigation actions that may be implemented by SBB to avoid, reduce or mitigate any identified risk.

3.6.7 Cumulative Effects

In accordance with the DPG 2025, the assessments should also consider how proposed drought actions may affect the environment in combination with the effects of existing licences, permits and plans.

There are a range of types of cumulative impacts that would require addressing, in particular:

- Assessment of the most likely cumulative impacts of the drought permit with other SBB supply side and drought permit / order actions within the study area (including both intra- and inter- zone actions) occurring at the same time; and
- Potential cumulative impacts with other projects and plans, including other regional drought schemes.

The cumulative effects of the DP27 have been assessed within the SEA Environmental Report.

Existing abstraction licences that operate within the hydrological focus reach of the drought actions, as well as other abstraction and discharge permits, will be incorporated in the baseline and assessment as described above.

3.6.8 Summarising assessment of the environmental features

The outcomes of the assessment of impacts on environmental features will be tabulated as per the example in **Table 3.6** below.

Table 3.6: Example of the summary of impacts table

Reach	Example Reach 1	
	Significance of Impact	**Mitigation Required (Y/N)**
NERC and Notable Species Receptors		
White-clawed crayfish	Moderate	Yes
Otter	Negligible	No
Water vole	Moderate	Yes
Brown trout	Moderate	Yes
Bullhead	Minor	No
Grayling	Minor	No
WFD Status Receptors	**Risk of Deterioration**	
WFD Water body	[*Water body ID and Water body Name*]	
Hydrological regime	Minor	No
Fish	Minor	No
Invertebrates	Minor	No
Water quality	Minor	No

3.7 Mitigation measures (avoid, reduce, mitigate or compensate)

3.7.1 Requirements of the Drought Plan Guidelines

The DPG 2025 requires water companies to set out any measures that will be implemented to avoid, reduce or mitigate the environmental impact of a drought management action (or compensation if legally required), and link these to clearly defined triggers. The details for each mitigation measure should provide sufficient information to be able to be quickly put into place, for example where equipment will be sourced from and how it will be deployed.

Mitigation measures should be set out into three stages as follows:

- Pre-drought mitigation actions (actions implemented before or whilst the drought is developing);
- In-drought mitigation actions (actions implemented during a drought); and
- Post drought mitigation actions (actions implemented following a drought).

Additionally, the DPG 2025 requires water companies to set out how they are going to measure their effectiveness and any permits/approvals that will be required such as landowner permissions, ordinary watercourse consents, flood risk activity permits (FRAPs) and other statutory requirements, where applicable

3.7.2 SBB Approach to Mitigation

The mitigation required for individual drought actions will be driven by the results of the sensitivity and impact assessments. Initial considerations of mitigation are provided in the SEA Environmental Report and technical appendices on HRA, WFD and INNS. Monitoring and modelling will be utilised to identify the targeted mitigation measures required for each action. This may include measures such as a hands-off flow, hands-off lake levels, specific abstraction volumes and/or particular periods of operation to avoid sensitivities. The identified mitigation measures will be kept under review to ensure that they remain suitable and effective.

The DPG 2025 also recommends implementing ‘no regrets’ mitigation measures during non-drought conditions which will help build environmental resilience to drought. For example, river restoration to improve habitat quality which was previously degraded within the area of drought permit impact. Restoring good habitat quality can help improve the resilience of the ecological community to flow alteration. No regret actions may also include wider projects delivered through WINEP. Nature based solutions such as runoff attenuation features, where located appropriately within the area of drought permit impact, can help to retain water in a catchment (or site) and improve resilience to dry weather and drought. WINEP aims to take an overall approach to increasing resilience and WINEP projects such as combined catchment management and river restoration implement nature-based solutions with multiple benefits including resilience and river health.

The relevant mitigation measures from this suite of measures will be identified for each drought permit and will be subject to review during any drought onset period.

Any monitoring specific to the mitigation measures and the effectiveness of these measures will be included in monitoring requirements to inform the actual impacts of drought management.

4 Environmental Monitoring Plan

4.1 Requirements of the Drought Plan Guidelines

As indicated in **Figure 3.1**, the DPG 2025 requires SBB to set out an EMP indicating the monitoring and mitigation required, following assessment of the sensitivity and impacts associated with drought actions. In particular, the DPG 2025 indicates that any drought plan should be accompanied by an EMP that sets out:

- On-going baseline monitoring to inform sensitivity and impact assessments;
- The monitoring that will be implemented to reduce uncertainty identified in the assessment of either the sensitivity of the environment or impacts on features considered in the detailed assessment; and
- The in-drought (both pre-permit and post-permit implementation) and post-drought (recovery) monitoring that will be carried out to understand the actual impact of drought management actions.

The DPG 2025 requires monitoring programmes to be designed to understand the difference between the natural impact of drought on the environment and that caused by implementing supply side drought management actions and normal levels of licensed abstraction. This can only be achieved by planned, effectively designed monitoring programmes. The DPG 2025 suggests using a Before-After-Control-Impact (BACI) approach. Paired control and impact sites monitored under baseline, in-drought and post-drought (recovery) stages could assist with understanding the differences between the impacts of natural droughts and drought management actions. The monitoring plan should also include and consider other pressures within the catchment to account for their impacts. Any decisions on changes to monitoring frequency should consider the need to understand the impacts of long-term climate change and the importance of not solely relying on historic data.

The DPG 2025 also requires SBB to set out a mitigation plan following the assessments of potential impacts associated with each drought management action. In particular, the DPG 2025 indicates that any drought plan should be accompanied by an EMP that sets out:

- Mitigation measures to reduce adverse impacts on the environment of supply side drought management actions; and
- Compensation measures for residual low-level (not significant or adverse) effects that remain after mitigation measures have been applied.

The DPG 2025 requires that this information is set out as a separate document alongside, and linked to, each of the environmental assessments.

Where, after detailed EAR investigation, there are remaining significant effects which could not be mitigated, SBB will review the relevant action with the intention of amending or removing the action from the drought plan.

4.1.1 SBB's Drought Plan 2027 EMP

A summary of the monitoring and mitigation for each drought action will be provided in each EAR chapter for DP27, with details regarding the monitoring and mitigation provided in separate chapters.

The EMP will fulfil several requirements of the DPG 2025, including:

- Establishing required baseline environmental monitoring and data acquisition to maintain and update the understanding of the environmental baseline conditions and reduce uncertainty both for DP27 and future drought plans;

- In-drought pre-permit application monitoring which will allow for describing the prevailing environmental conditions prior to drought permit or order implementation. This will inform the implementation and management of mitigation actions during the drought;
- In-drought post-permit implementation monitoring which will inform the actual impacts on the environment during the implementation of the drought permit. Surveillance monitoring of sensitive locations, informed by walkover surveys and the results of the pre-drought monitoring, will provide early warnings of any unpredicted environmental impacts and ensure the mitigation actions are operating as designed; and
- Post-drought monitoring to describe the recovery of environmental conditions following the cessation of a drought permit and establish whether the affected ecosystems have recovered to conditions prevailing in the pre-drought period.

The EMP sections that accompany SBB's DP27 will provide a framework for monitoring and mitigation that would be followed during a drought permit. The EMPs will consider the outcomes of consultation with the Environment Agency and Natural England.

SBB are currently reviewing drought permit readiness across their DP27 actions. This includes provisionally identifying the monitoring needs of the action, what SBB and EA monitoring data is available, and what WINEP monitoring data there is.

The EMP sections that accompany SBB's DP27 will provide a framework for monitoring and mitigation that would be followed during a drought permit. The EMPs will consider the latest data within the study area and the results of the sensitivity screening assessments. The existing SBB and WINEP monitoring data will also be identified in the EMPs.

The EMP should include:

- the elements/receptors of the environment to be monitored;
- the location (National Grid Reference (NGR) – except where redacted for national security);
- in-year and between year frequency of monitoring;
- sampling/survey methods;
- relevant standards;
- any changes in approach between stages (for example, increasing the frequency of sampling during the in-drought stage);
- who is responsible for carrying out monitoring;
- planned approach to analysing the monitoring data.

The outcomes of the monitoring plan will be tabulated as per the example in **Table 4.1** below. It is anticipated that the Environment Agency will review and agree the EMPs prior to implementation.

Table 4.1: Monitoring Plan Outcomes

[Drought Permit Name] Monitoring Plan						
Feature of interest	Location (NGR)	Control or Impact	Method and relevant standard	Baseline (frequency, timing, responsibility)	In-drought (frequency, timing, responsibility)	Post-drought (recovery (frequency, timing, responsibility)

5 Reporting

5.1 Approach to Reporting

The DPG 2025 recommends that full environmental assessments – including mitigation measures and associated monitoring plans – are provided within the technical appendices, while the main report contains a concise, high-level summary outlining the proposed action, the outcome of the environmental assessment, and the key mitigation measures.

For DP27, the EARs will follow the below structure. Each EAR will include a main report summarising the sensitivity and potential impacts associated with each drought permit, alongside the proposed monitoring and mitigation specifications. Detailed assessments will be presented in the technical appendices. These appendices will set out the following:

- Baseline environmental conditions
- Data used to inform the baseline
- Study area associated with each standard drought action
- Potential changes to the physical environment resulting from the drought actions
- Distribution and sensitivity of environmental features associated with each action
- Detailed assessment of potential impacts

To ensure the EARs remain ready for use, they should be reviewed regularly, with their readiness reported through the annual drought health check. This process ensures that environmental assessments remain up to date with the latest evidence and helps reduce uncertainty.

The proposed structure for the DP27 EARs is as follows:

Section	Title
0	**Executive Summary**
1	**Introduction**
1.1	Background
1.2	Drought management planning
1.3	Purpose of this EAR
1.4	Structure of the report
2	***[Name of Drought Permit]***
2.1	Proposed drought permit 2.1.1 Overview of the proposed drought action 2.1.2 Site setting 2.1.3 Current operational and abstraction regime 2.1.4 Historic abstraction 2.1.5 Need for the drought action 2.1.6 Alternative measures considered
2.2	Consultation to date
3	**Methodology**
3.1	Environmental assessment methodology 3.1.1 Determination of sensitivity and significance

	3.1.2 Legislative requirements and compliance 3.1.3 Limitations of the assessment
4	**Baseline**
4.1	Baseline Environment 4.4.1 Study Area 4.4.2 Baseline environment pre-drought 4.4.3 Baseline environment in-drought 4.4.4 Knowledge gaps
5	**Likely Changes to the Environment**
5.1	Physical environmental impacts 5.1.1 Hydrological and hydrogeological impacts 5.1.2 Water quality impacts 5.1.3 Geomorphological impacts 5.1.4 Other environmental pressures 5.1.5 TABLE: Summary of potential changes to the physical environment
5.2	Environmental features and sensitivity 5.2.1 Internationally and nationally designated sites 5.2.2 Othe designated sites 5.2.3 Protected species and habitats of principal importance 5.2.4 Diatoms/phytobenthos 5.2.5 Macrophytes 5.2.6 Macroinvertebrates 5.2.7 Fish 5.2.8 Invasive Non-Native Species (INNS) 5.2.9 Landscape, navigation, recreation and heritage. 5.2.10 TABLE: Outcome of screening and sensitivity assessments
6	**Likely Environmental Impacts**
6.1	Impacts on habitats and species
6.2	Impacts on WFD status
6.3	Cumulative effects
6.4	Level of confidence
6.5	TABLE: Summary of significance of environmental impacts
7	**Mitigation and Monitoring**
7.1	Mitigation measures - Pre-drought mitigation actions - In-drought mitigation actions - Post-drought mitigation actions
7.2	Monitoring requirements - Pre-drought (baseline) monitoring - In-drought (pre-permit) monitoring - During permit monitoring - Post-drought (recovery) monitoring

Appendices
Appendix A Environmental Monitoring Plan
Appendix B Changes to Physical Environment *To include:* - *Detailed evidence, datasets and technical information used* - *The process used to select datasets and evidence to complete the environmental assessment* - *Data analysis methods and tools used to complete the environmental assessment* - *Main sources of uncertainty and level of confidence in the environmental assessment*
Appendix C Environmental Features *To include:* - *Baseline and sensitivity of environmental features and WFD features* - *Baseline maps* - *Environmental features screening* - *Environmental features impact assessment* - *Cumulative effects assessment*
Appendix D Hydrological/Hydraulic modelling report ***To include:*** - ***Baseline model*** - ***Calibration graphs and statistics*** - *Model uncertainty and level of confidence in model* - ***Baseline flow statistics for key reaches*** - ***Drought option flow statistics*** - *Recommendations for further/on-going monitoring to improve model certainty* - *Cumulative effects assessment*