Hafren Dyfrdwy: Final Water Resources Management Plan 2019 – Water Framework Directive Report

Final Report for Hafren Dyfrdwy

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1 Introduction

1.1 WFD and Water Resources Management Planning

Water companies in England and Wales have a statutory requirement to prepare a Water Resources Management Plan (WRMP) every five years; the next WRMP must be submitted in draft to the Secretary of State to seek agreement for issuing for public consultation during early 2018, with the final plan submitted for approval to the Secretary of State in late 2018 or early 2019. This WRMP19 also informs the regulatory water company business planning Price Review' process through which the Water Services Regulation Authority (Ofwat) sets the prices that water companies can charge their customers for water (and wastewater) services. The next Price Review will be in 2019.

Hafren Dyfrdwy is issuing its Final Water Resources Management Plan (WRMP) for following approval by the Welsh Ministers in autumn 2019 and has undertaken a Water Framework Directive (WFD) screening assessment to inform the development of the plan.

Hafren Dyfrdwy's Final WRMP 2019 (fWRMP19) focuses on delivering a reliable, affordable water supply service that is resilient to future challenges, notably potential sustainability reductions at various existing water sources and climate change impacts on drought frequency and magnitude. In developing the fWRMP19, Hafren Dyfrdwy needs to balance the delivery of a resilient and affordable water supply service with protection of the environment, including compliance with the WFD and other environmental regulation. This is consistent with Article 1 of the WFD which states that one of the purposes of the Directive is to contribute to "mitigating the effects of floods and droughts and thereby contribute to the provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use".

This report sets out the regulatory background and guidance for WFD and WRMPs, the baseline water environment and the WFD screening assessment of Hafren Dyfrdwy's fWRMP19.

1.2 Hafren Dyfrdwy Final WRMP19

The fWRMP19 demonstrates how Hafren Dyfrdwy intends to meet the demand for water and protect the environment over the next 25 years planning period from 2020 to 2045. A surplus of resources over demand plus headroom has been forecast taking into account abstraction licence sustainability reductions, the impacts of climate change on supplies, and demand forecasts that take account of the latest population and property growth information from Local Authorities. The fWRMP 2019 includes no new supply schemes. However, even though there is no forecast supply deficit, Hafren Dyfrdwy's fWRMP19 includes the following demand management measures reflecting customer expectations and Welsh Government priorities:

- Enhanced metering programme: to help reduce per capita consumption that will see promotional campaigns to encourage the uptake of optional metering and the continuation of the change of occupier metering policy.
- Enhanced water efficiency services: including bespoke home visits to provide behavioural advice and fit water saving devices, such as shower regulators and timers, for free, plus increased digital services enabling customers to better understand and track their water use. For non-household customers, water use audits and self-audit packs will be available on request.
- Leakage management and reduction: delivered through the enhanced metering programme (it is easier to identify and fix leaks on properties with a meter), mains renewal and through innovation activities such as improved data analysis and new technologies.

The fWRMP 2019 also recognises the scope for water trading with other companies. New imports from other companies are not included in the fWRMP 2019 due to the supply surplus and, although discussions with neighbouring companies regarding possible new exports have been ongoing during pre-consultation for the fWRMP 2019, no additional resources are proposed to support any new transfers of water to other companies.

2 Regulatory Background and Guidance

2.1 Water Framework Directive (WFD)

In 2000 the "Directive for establishing a framework for the Community action in the field of water policy - EC 2000/60/EC" (i.e. Water Framework Directive (or WFD)) came into force. This is transposed into English and Welsh law by the "Water Environment (Water Framework Directive) (England and Wales) Regulations" 2017[1]. In Wales, the responsibility for ensuring that the WFD is implemented lies with Welsh Government and Natural Resources Wales (NRW).

The WFD requires that all inland and coastal waters achieve good status (or potential) by 2027 at the latest and defines how this should be achieved through the establishment of environmental objectives for groundwater and surface waters. Other fundamental objectives of the WFD include:

- Prevent deterioration of aquatic ecosystems;
- Comply with water related standards and objectives for environmentally protected areas;
- Reduce pollution from priority substances and cease or phase out discharges from priority hazardous substances; and
- Prevent or limit input of pollutants into groundwater and reverse any significant or sustained upward trends in the concentration of any groundwater pollutant.

The Groundwater Directive (2006/118/EC) (GWDD) complements the WFD by setting quality standards to prevent and limit pollutants entering groundwater, in order for all groundwater bodies to achieve a good status. The GWDD was transposed into law by the Groundwater (England and Wales) Regulations (2009), which were subsequently revoked by the Environmental Permitting (England and Wales) Regulations which were last updated in 2016[2].

The current baseline status (i.e. 2015 WFD classification) and the measures required to achieve good status by 2027, are set out for each water body in the relevant River Basin Management Plans (RBMPs). NRW is responsible for preparing RBMPs for Welsh rivers, while RBMPs for transboundary rivers are prepared in conjunction with the Environment Agency, every six years. The baseline for Hafren Dyfrdwy's supply area is described in Section 3.

2.2 WFD Requirements Hafren Dyfrdwy Final WRMP19

The requirements for a WFD assessment of a water company WRMP are explained in the 2016 Water Resources Planning Guidelines (WRPG) (**Box 1**). These WRPG requirements reflect the Welsh Government's view that companies should take account of the government's objectives for the environment "including the appropriate parts of the EU Water Framework Directive". Government also expects that companies will:

- Have regard of RBMPs and their objectives when making decisions that could affect the condition of the water environment
- Ensure that current abstractions and operations, as well as future plans, support the achievement of environmental objectives and measures set out in RBMPs.
- Continue working with NRW to take a proportionate and evidence-based approach to identify the changes needed to current abstraction licences to meet environmental requirements
- Ensure plans:
    - prevent deterioration in water body status;
    - support the achievement of protected area and species objectives;
    - support the achievement of water body status objectives.

[1] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at https://www.legislation.gov.uk/uksi/2017/407/contents/made Accessed 31 January 2019
[2] The Environmental Permitting (England and Wales) Regulations 2016. Available at http://www.legislation.gov.uk/uksi/2016/1154/contents/made

Box 1. WRPG 2016

Water Framework Directive Assessment of a WRMP
(Section 6.11 Water Framework Directive)

*"You must take account of the **requirements of the WFD**, including the legally binding **environmental objectives in the river basin management plans**, when considering your proposed solution(s). You should consider solutions that promote the requirements of Article 7 of WFD (that seeks, as a minimum, to **prevent deterioration of water with the aim of reducing the treatment needed to produce drinking water**) and look to work in partnership with others. You should review solutions that have been identified in RBMP and this may require partnership working with others in the catchment to achieve the solution.*

*You should confirm that there is **no risk of deterioration from a potential new abstraction or from increased abstraction** at an existing source before you consider it as a **feasible option**. In addition, you should ensure that **any options do not prevent the achievement of good status (or potential)**. You should talk to the Environment Agency or Natural Resources Wales about any intended actions that may cause deterioration of status (or potential) or prevent the achievement of the water body status objectives in the river basin management plans or for new modifications the achievement of good status (or potential). You should do this as soon as possible before developing your plan and you should make a clear statement in your plan about any potential impacts.*

*Your plans should include targeted and cost-effective **implementation of restoration measures required at the catchment scale**, either working solely or in partnership with other catchment based organisations. Given the uncertainty over the level of confidence you should consider the principles of adaptive management, with associated pre and post project monitoring."*

The WRPG refers to ensuring 'no deterioration' of water body status. A recent (2015) European Court of Justice (ECJ) ruling[3] clarified that 'no deterioration' means a deterioration **between** a whole 'status class' (e.g. 'good', 'moderate', etc.) of one or more of the relevant 'quality elements' (e.g. biological, phyisco-chemical, etc.). This definition applies equally to Artificial Water Bodies and Heavily Modified Water Bodies in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status. This definition of 'no deterioration' has been used in carrying out the screening assessment.

2.3 The Over-riding Principles of the WFD Assessment

The fundamental environmental objectives of the WFD are to attain good ecological status and prevent deterioration of the status of water bodies. These objectives are set down in Article 4 of the WFD. Any new development (as well as existing operations) must ensure that these WFD objectives are not compromised.

Article 4 on environmental objectives has been interpreted and further developed in WRPG (2016) to give a series of objectives to test in the WFD assessment. These are listed in Table 1 (below).

Table 1 WFD assessment objectives

WRPG (2016) objectives[a]
1) Prevent deterioration in water body status (or potential) compared to the baseline status reported in the 2015 RBMP. However, if deterioration has occurred in the water body during the first RBMP cycle there may be a need to restore sustainable abstraction.
2) Support the achievement of protected area objectives.
3) Support the achievement of the environmental objectives in the 2015 plans.

[3] ECJ Case C-461/13: Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland http://curia.europa.eu/juris/document/document.jsf?docid=178918&mode=req&pageIndex=1&dir=&occ=first&part=1&text=&doclang=EN&cid=175124 [accessed 24.11.17]

4) Ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body.

a Reproduced from Section 4.4 of WRPG (2016)

2.4 Levels of Assessment

Defra/Environment Agency (2009) sets out a sequential 3-stage process for undertaking WFD assessments of Flood and Coastal Risk Management schemes appropriate to promoted schemes. These are targeted to address the objectives reproduced in **Table 1** above, with increasing levels of detail. Not all stages are applicable to all assessments, and the guidance describes when to proceed to the next stage. These stages are:

- Preliminary Assessment: This describes the planned project, documents and reports the identified hydro-morphological response and compares this to identified biological quality elements (and their requirements). This stage is also referred to at the WFD compliance assessment screening and identifies the risk of deterioration in WFD status based on expert judgement.
- Level 1. This involves using expert judgement to assess the likely changes to hydro-morphology occurring as a result of an activity and the possible significance of changes for biology.
- Level 2. This examines the nature of the changes and their impacts on biology. A variety of techniques are incorporated into Level 2 of the assessment, including a wide range of specialist techniques.

3 Baseline

3.1 Water Framework Directive Water Bodies

In the context of the WFD, the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. Hafren Dyfrdwy's is comprised of four water resource zones (WRZ), including; Saltney, Wrexham, Llanfyllin, Llandinam and Llanwrin. These WRZs are situated predominantly within the Severn Uplands and Dee River Basin Districts (RBD), with a smaller portion of the area falling within the Western Wales RBD, respectively. The WFD status of water bodies within these RBDs is summarised in **Table 3**.

3.1.1 Surface Waters

Rivers

The Dee RBD includes the River Dee and its tributaries, such as Afon Alyn. The Severn Uplands RBD includes the River Severn as well as its upland tributaries such as Afon Dulas and Afon Vyrnwy. The Dee and Severn are some of the most important rivers used for public water supplies in England and Wales. The flow of the River Dee is heavily regulated to allow for abstraction for public water supply, navigation, agricultural and industrial purposes, whilst maintaining enough in-channel flow to sustain healthy flora and fauna communities and the passage of migratory fish. Hafren Dyfrdwy is licenced to abstract from the River Dee at one abstraction point, at Twll (Sesswick); Hafren Dyfrdwy has no abstractions from River Severn or any other watercourses.

Lakes

Hafren Dyfrdwy's assessment area also includes 8 WFD lake water bodies. The smallest lakes are Pen-y-Cae Lower Reservoir, Pen-y-Cae Upper Reservoir, Pendinas Reservoir, Llyn Cyfynwy Reservoir, Nant y Ffrith Reservoir, Ty Mawr Reservoir, Cae Llwyd Reservoir and Pant Glas, while the largest ones are Llyn Efyrnwy and Llyn Clywedog. **Figure 1** shows the distribution of surface waters in the assessment area.

3.1.2 Groundwater

The main groundwater bodies situated within the supply area are the Severn Uplands – Lower Paleozoic, Dee Silurian/Ordovician and Meirionnydd. The majority of Hafren Dyfrdwy 's water resources

are dependent on abstraction from rivers and reservoirs, with three operational groundwater sources – a spring source at Llangollen Spring, and boreholes at Llandinam and Llanwrin. Both the quantity and quality of groundwater is extremely important in maintaining these resources. **Figure 2** illustrates all the groundwater bodies within Hafren Dyfrdwy's WRZ and their quantitative status at low flows (Q_{95}).

3.1.3 WFD Status

For surface waters, there are two separate status classifications for water bodies: ecological and chemical. For a water body to be in overall 'good' status/potential both ecological and chemical status must be at least 'good'. Biological status classification considers the condition of biological quality elements, e.g. aquatic invertebrates, plants and fish, the morphology of the habitat available, concentrations of supporting physico-chemical elements e.g. oxygen or ammonia and concentrations of specific pollutants. **Table 3** shows the proportion of waterbodies achieving good or high WFD status (overall and individual elements) as reported in the RBMPs Cycle 2. Waterbodies in the River Dee RBD do not have objectives proposed for 2021, the target of achieving good overall status being delayed until 2027. The main reasons for failure to achieve good WFD status and deterioration of waterbodies in the Dee management catchment are due to pressures from the agricultural and rural land management, urban and transport as well as the water industry. Similarly, waterbodies within the Severn Uplands management catchment also failed to achieve good WFD status due to pressures from agriculture and rural land management and water industry but also due to mining and quarrying.

Under the WFD there are two separate classifications for groundwater bodies: chemical status and quantitative status. A groundwater body will be classified as having poor quantitative status in the following circumstances: where low groundwater levels are responsible for an adverse impact on rivers and wetlands normally reliant on groundwater; where abstraction of groundwater has led to saline intrusion; where it is possible that the amount of groundwater abstracted will not be replaced each year by rainfall. For a groundwater body to be at good status overall, both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status. The main reasons for poor status were identified as high or rising nitrate concentrations, with some failures for pesticides and other chemicals. The main reason for poor quantitative status within the Severn RBD is that abstraction levels, mainly for public water supply, exceed the rate at which aquifers recharge[4]. In the Dee RBD; there are no water bodies that have deteriorated in overall water body classification from the 2009 baseline, however the reasons for failure to achieve good status is linked to nutrient pollution from agriculture.

Table 3 Classification status and objectives for waterbodies within the RBDs relevant to the Hafren Dyfrdwy for RBMP Cycle 2 (2015)

RBD	Relevant RBMP Management catchment	% at good or high ecological status or potential		% assessed at good or high biological status		% at good chemical status		% at good status overall	
		RBMP 2015	Target 2021	RBMP 2015	Target 2021	RBMP 2015	Target 2021	RBMP 2015	Target 2021
Dee	Dee	0	10	10	30	90	NA	0	NA
Severn	Severn Uplands	24	82	43	61	81	95	24	82
	Teme	30	65	28	59	98	98	28	63

[4] Environment Agency (2015), Severn River Basin District River Basin Management Plan

	Wye	24	38	30	N/A	98	N/A	24	38
Western Wales	Meirionnydd	33	N/A	67	N/A	78	N/A	33	39
	Teifi and North Ceredigion	8	N/A	75	N/A	67	N/A	8	22

3.2 Current Abstractions

3.2.1 Overview of sources

Currently, Hafren Dyfrdwy operates four water resource zones (WRZ), namely Wrexham, Saltney, Llanfyllin and Llandinam & Llanwrin. The principal supply for the Wrexham Resource Zone is the River Dee which supplies 82% of the raw water, the remaining 18% is from a series of upland reservoirs and a spring at Llangollen. The Llandinam & Llanwrin WRZ supply is from groundwater sources. Neither Saltney and Llanfyllin WRZs have their own water sources and are supplied solely via bulk supply transfers from the Severn Trent supply area. The EA (England) and NRW (Wales) are responsible for managing abstractions in England and Wales, for supplies greater than 20 m^3/day. Any abstraction licences that have the potential to cause environmental harm have been flagged through the Restoring Sustainable Abstraction work or through the Water industry National Environment Programme (WINEP) / Wales National Environment Programme (NEP) analysis. The Restoring Sustainable Abstraction Programme has been used by EA and NRW to review and investigate sites in England and Wales where the habitat or ecology dependent on the water is at risk from a potentially unsustainable abstraction. This may result in the requirement for a water company to reduce existing abstraction to help restore the environment. None of Hafren Dyfrdwy's current abstractions have been flagged for intervention under the RSA programme. The Welsh NEP was finalised in March 2018, there are no identified sites where a reduction in abstraction will provide an environmental benefit. The sources owned and operated by Hafren Dyfrdwy are shown in **Figure 3**.

Figure 1 Water Framework Directive (WFD) Surface Water Features in the Hafren Dyfrdwy

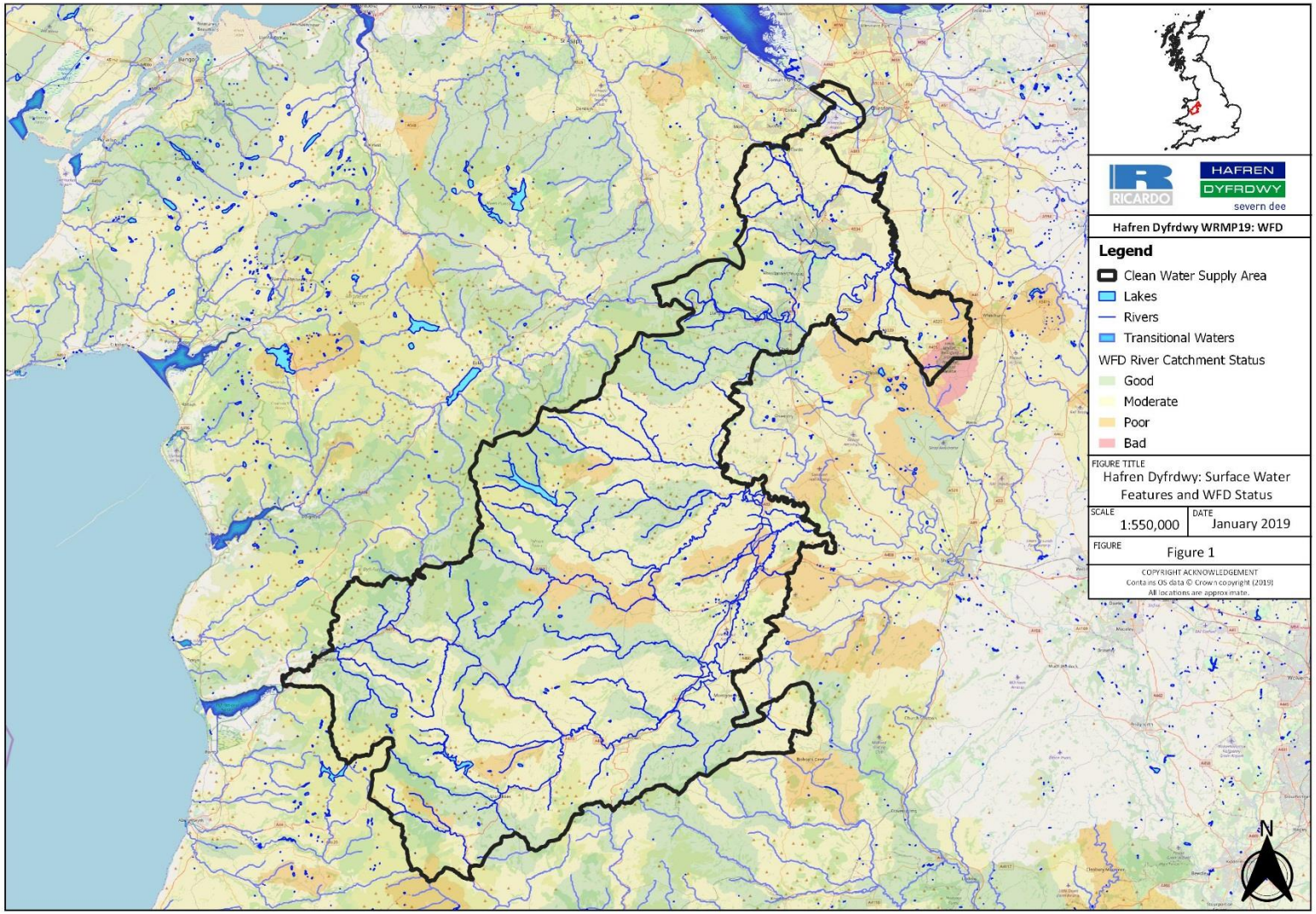


Figure 2 Water Framework Directive (WFD) Groundwater Quantitative Status in the Hafren Dyfrdwy

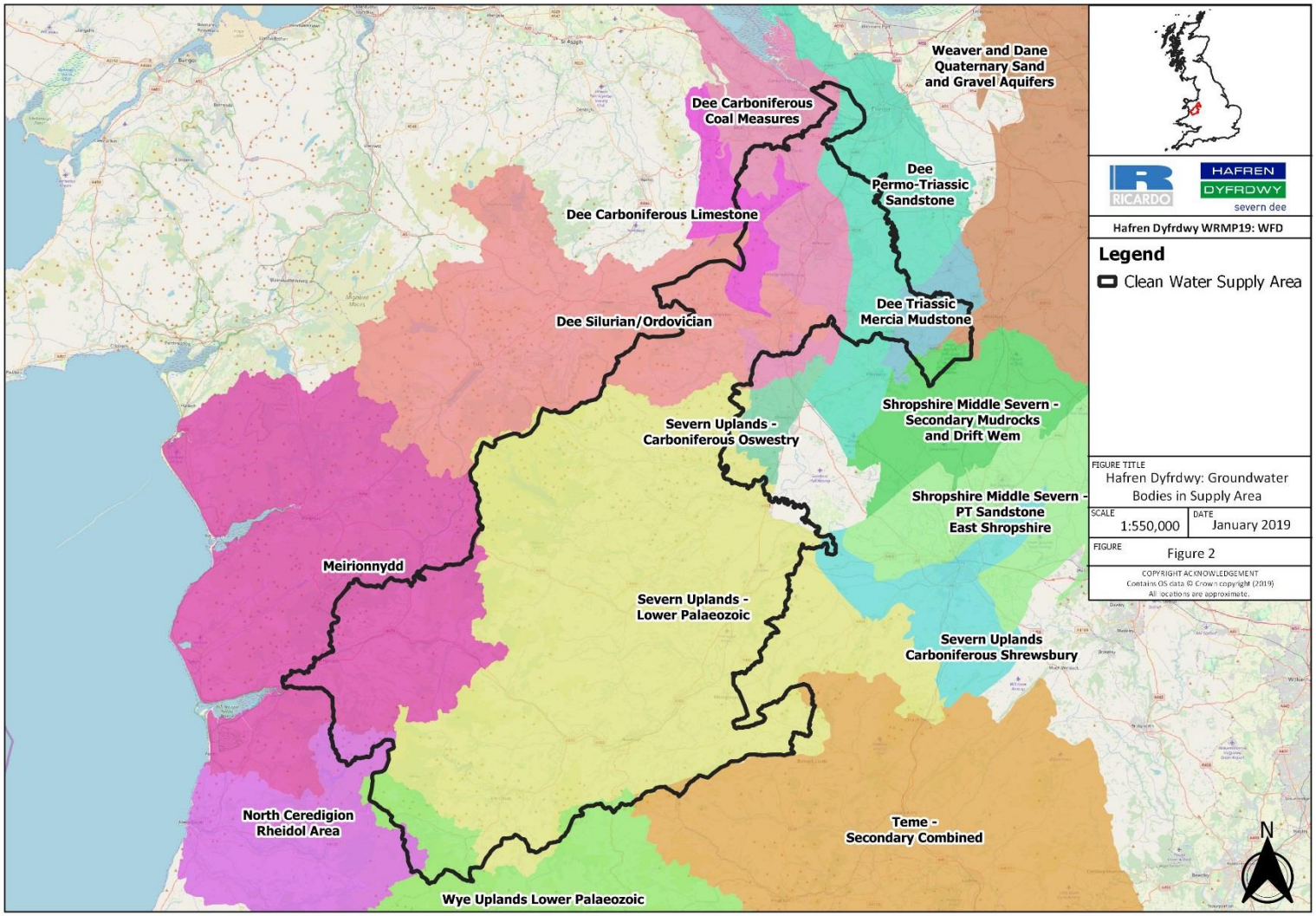
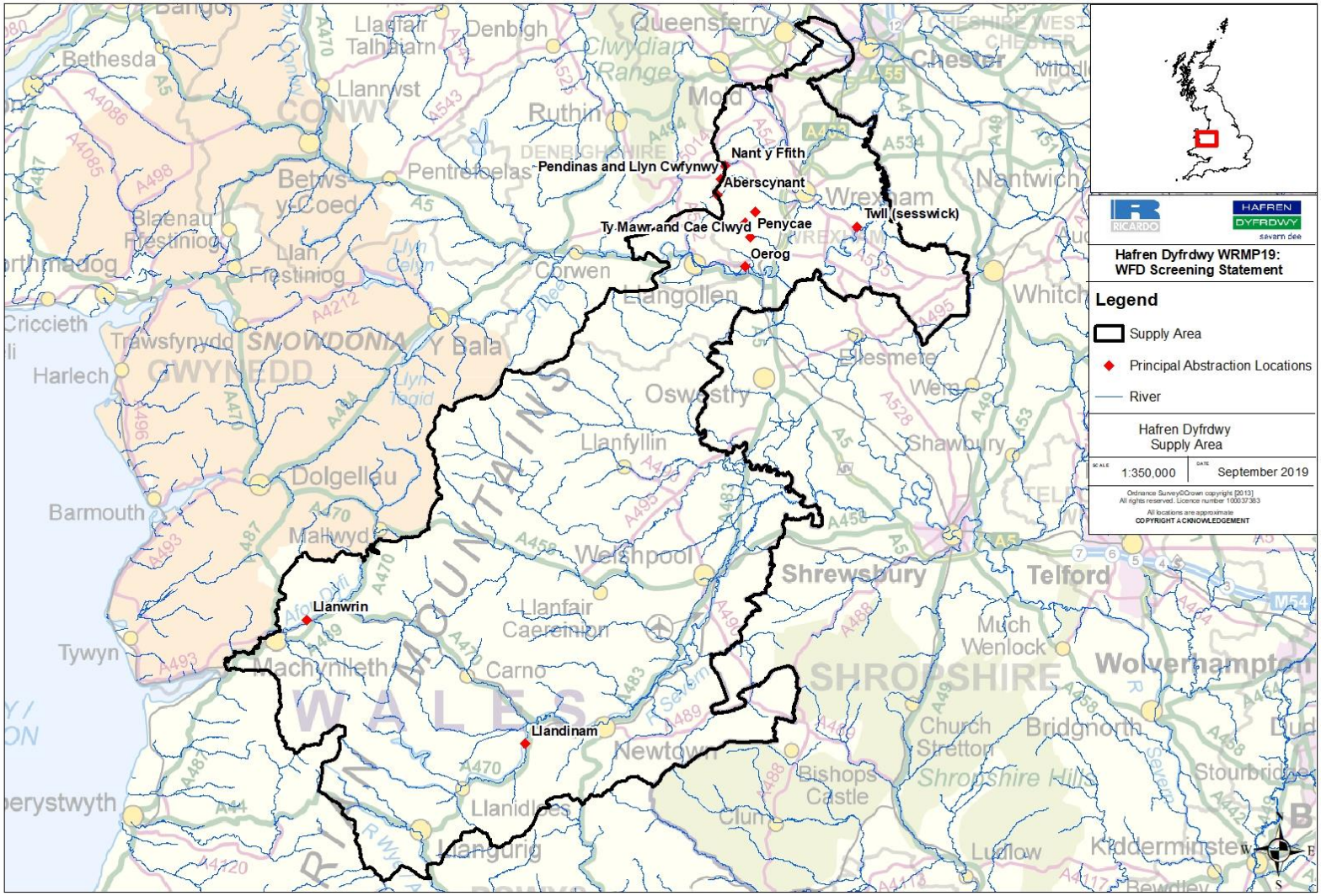


Figure 3 Hafren Dyfrdwy's Supply Area



4 Final WRMP 2019 WFD Compliance Assessment Screening

Hafren Dyfrdwy's fWRMP does not include any supply side options, relying entirely on demand management options. The three demand management options in Hafren Dyfrdwy 's fWRMP19 are focus on delivering an enhanced metering programme, enhanced water efficiency services and leakage management and reduction. As such, these options are considered to have a beneficial impact on the water environment as they will reduce the need to abstract more water. As they will have no risk of causing a deterioration in WFD status or preventing the attainment in WFD objectives, the fWRMP19 is assessed as compliant with WFD objectives.

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