



# **Holbeach Marsh Abstraction Licensing Strategy**

A strategy to manage water resources sustainably

March 2020

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# 1. About the licensing strategy

This strategy sets out our approach to managing new and existing [abstraction](#) and [impoundment](#) within the Holbeach Marsh [catchment](#) in the Anglian river basin district. This abstraction licensing strategy (ALS) should be read in conjunction with the Welland and/or Nene ALS. All our ALS documents are available [here](#).

Our approach ensures that River Basin Management Plan objectives for water resources activities are met and we avoid deterioration within this catchment.

We apply this approach to the [water body](#) in which the abstraction is located. It also applies to all downstream [surface water](#) bodies that may be affected by any reduction in abstraction-related flow, or adjacent [groundwater](#) bodies affected by any reduction in groundwater level.

Please see [Managing Water Abstraction](#) for the technical explanation, legal and policy requirements behind the Abstraction Licensing Strategy ([ALS](#)).

Please see [abstraction pages on gov.uk](#) for advice on who needs an abstraction or impoundment licence, and how to apply.

## 1.1. Why have we produced a separate abstraction licensing strategy for the Holbeach Marsh area?

Farmers in the Holbeach Marsh area have relied on mains supply water in the past to irrigate their vegetable crops, largely due to the salinity levels in the drains and the perception that the groundwater in the area is saline and unusable. In recent years local farmers have been investigating alternative sources of water, primarily an extensive layer of low-salinity groundwater that overlies deeper saline groundwater (see Section 3.2). Due to the increased interest in water resources in Holbeach Marsh this strategy document has been written. The aims of this strategy document are to:

- Ensure that all applications for water abstraction are treated consistently.
- Provide background information for those looking to use water resources in the Holbeach Marsh area.

## 1.2. Summary of the Holbeach Marsh abstraction licensing strategy

Any applications for water abstraction will be assessed on a case-by-case basis. When assessing applications for water abstraction in the Holbeach Marsh area, consideration will be given to the possible impact of the proposed abstraction upon:

- the Wash Special Protection Area (SPA) and Special Area of Conservation (SAC);
- saline groundwater pull-up and the salinisation of soils;
- local surface water features (including saline lagoons).

Because of the nature of the water resource in this area, and the unique abstraction techniques required (see Section 3.2), applicants for groundwater abstractions are likely to need a consultant to undertake pre-application groundwater investigations and to specify adequate operational monitoring routines (see Section 4.1).

The abstraction of high quality groundwater could open up the possibility of abstracting lower quality water from surface drains for blending. Applications for surface water abstraction from the local drainage network will be considered and assessed on a case-

by-case basis. To support an application for surface water abstraction a period of pre-application environmental monitoring and survey is likely to be required (see Section 4.2).

## 2. The Holbeach Marsh area

Holbeach Marsh is an area of low-lying agricultural land to the east of Holbeach, north of the A17 (see Map 1). Lying to the west-south-west of the Wash Estuary, Holbeach Marsh is bordered to the east by the tidal Nene and to the west by the tidal Welland. The geology of the area is dominated by a continuous surface layer of marine alluvium which is composed of silt, sand and clay deposits. This marine alluvium is underlain by glacial boulder clay, sand and silt deposits within which sand-filled creeks and some peat horizons can be found.

Surface water in the area is primarily derived from rainwater or land drainage sources. Holbeach Marsh is characterised by a network of drainage ditches. However, as the drains do not receive water from high level feeder rivers the area is not considered to be a true level dependent environment (see Appendix A). Consequently, the Holbeach Marsh has not previously been assessed as part of the ALS process. The area does however lie within the South Holland Internal Drainage Board (IDB) who manage a number of drains in the area.

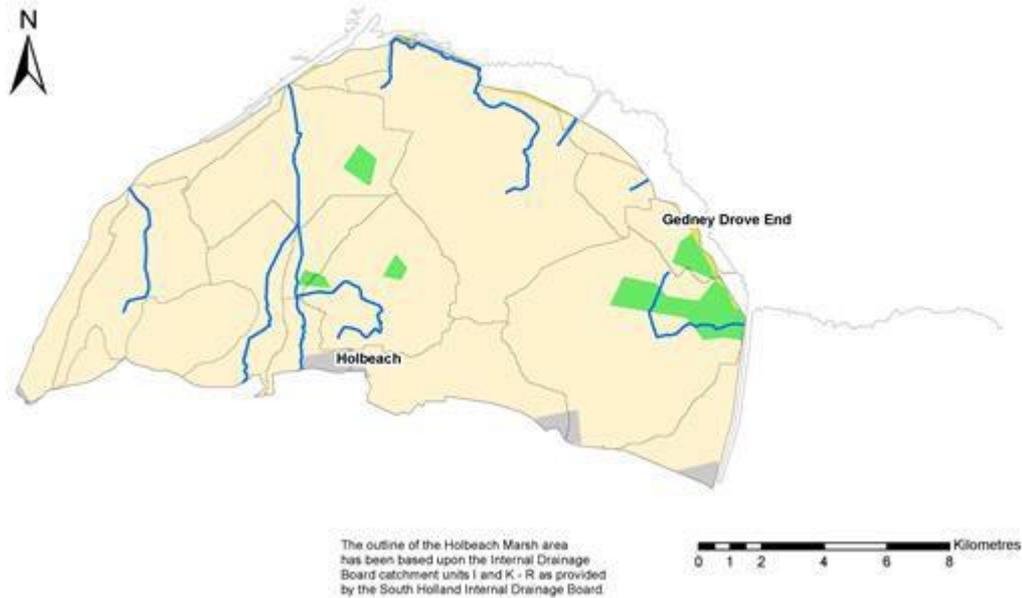
The nearby Wash bay is a designated Site of Special Scientific Interest (SSSI) within The Wash Special Protection Area (SPA) and The Wash and North Norfolk Coast Special Area of Conservation (SAC), and is the largest estuarine system in the UK. The rivers Ouse, Nene, Welland and Witham discharge into the bay and between them drain an area of approximately 15,000 km<sup>2</sup>. The Wash plays an extremely important role in relation to the wider coastal and marine environment of the region. The Wash is of outstanding importance for wildlife and is also a valuable natural resource that people have long benefited from. It supports many different species and, as well as its large-scale sub-tidal and inter-tidal habitats, the Wash has a number of valuable fringing habitats of conservation significance, such as saline lagoons and shingle structures.

The impact of freshwater flows and abstractions on the Wash was assessed during the Habitats Directive Review of Consents process. It was concluded that freshwater inputs from the Welland and Nene have very little effect on the SAC interest features that occur within inter-tidal areas of The Wash, and a limited effect on sub-tidal features. The value of freshwater flows to The Wash from the smaller drains and creek systems is recognised.

During the necessary pre-application investigations (see section 4.1), consideration will be given to how the removal of the freshwater layer may impact on the level of water within the adjacent drains (some of which may be important saline lagoon habitat).

Map 1 The Holbeach Marsh area.

### Holbeach Marsh Area



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Legend:

-  Rivers
-  Waterbodies
-  Arable
-  Managed Grassland
-  Semi Natural Vegetation
-  Urban

## 3. Water resource availability of the Holbeach Marsh ALS

### 3.1. Resource availability

If you want to abstract water (from either the ground or surface water sources), you need to know what the water resource availability within a catchment is and where abstraction for consumptive purposes is allowed. When assessing resource availability for abstraction we need to consider the environmental requirements for water and the rights of other licensed water users. We'll add any conditions necessary to protect water resources to a new or varied licence during the licence determination procedure (see Section 3.3).

### 3.1.1. Groundwater availability

A simple groundwater balance approach has been used to determine whether or not there is groundwater available for abstraction in the Holbeach Marsh area. The groundwater balance approach calculates the difference between how much water is input into the Holbeach Marsh system (rainfall) and how much water leaves the system (through evapotranspiration, groundwater recharge, surface water abstraction etc, see Figure 3.1).

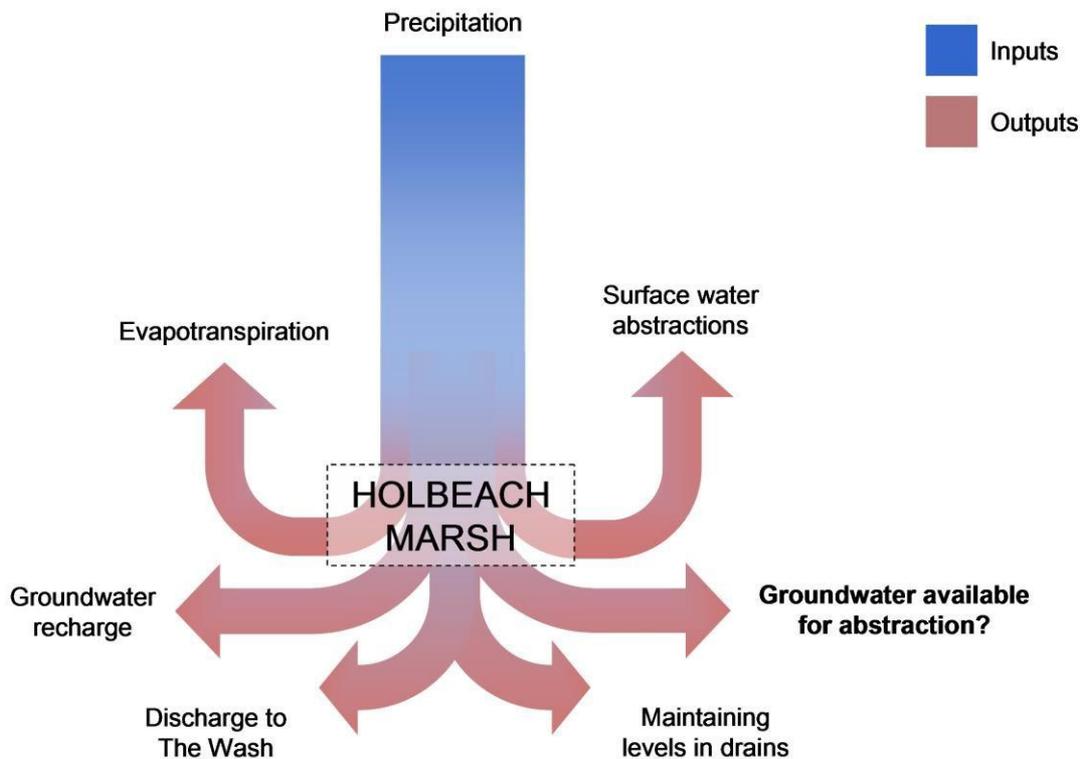


Figure 3.1 Water balance approach to determine the availability of groundwater for abstraction.

The resource availability assessment concludes that there is currently groundwater available for abstraction in the Holbeach Marsh area.

It should be noted that there are limitations associated with the groundwater balance approach and the data used in the calculation. Consequently, although this approach constitutes our best understanding of groundwater availability in the Holbeach Marsh area, the figures obtained are estimates.

### 3.1.2. Surface water availability

In addition to proposals which involve the abstraction of shallow groundwater, customers may develop surface water abstraction proposals to take water from the local drainage network. There is water available for abstraction in the surface drains in the Holbeach Marsh area, but it is typically highly saline. Customers may wish to consider the possibility of blending lower quality surface water from the drains with less saline groundwater (abstracted using the methods outlined in Section 3.2), subject to quality control and monitoring (see Sections 4.1 and 4.2).

## 3.2. Water abstraction methods in the Holbeach Marsh area

Until recently there has been only limited water abstraction in the Holbeach Marsh area due to the salinity of water in the drains. The possibility of taking surface water from neighbouring main rivers has previously been explored, but has not resulted in a successful abstraction agreement to date.

There have been several successful applications for groundwater abstraction in the area. These abstractions make use of a layer of useable low salinity groundwater that overlies deeper, highly saline groundwater. The depth of this usable groundwater is variable, but it is generally no deeper than 10m and is often considerably shallower. The usable groundwater is intercepted by a series of catch-pits which are allowed to fill 'naturally', collecting groundwater as it flows horizontally (and to some extent vertically) through the sand and silt layers (Figure 3.2). Water is subsequently recovered from the catch-pits for use in irrigation and/or to fill storage reservoirs.

When abstracting from catch-pits, particular care must be taken to avoid the pull-up of deeper saline groundwater as, once induced, saline contamination of the catch-pit cannot be readily mitigated. By maximising the horizontal flow of groundwater and restricting the vertical movement of groundwater, catch-pit abstraction reduces the chance of saline pull-up. To further reduce the chance of saline pull-up multiple catch-pits are sometimes used in rotation to allow water levels in individual catch-pits to recover before repeat abstraction.

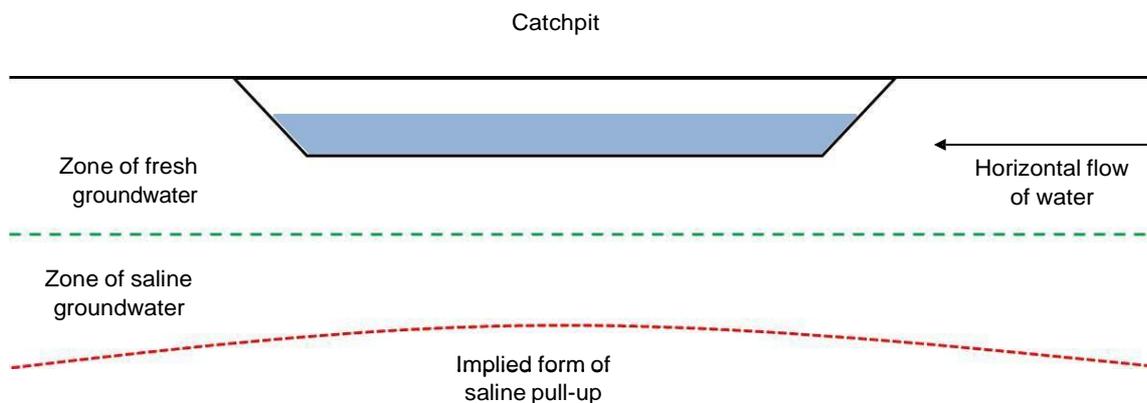


Figure 3.2 Abstraction of groundwater using shallow catch-pits.

Abstraction from the catch-pits may be seasonally variable with reduced or limited yields occurring during dry periods. Furthermore, the individual catch-pits are unlikely to have sufficient capacity to provide irrigation water directly, and to use them in this manner with sustained drawdown would risk saline contamination, particularly in the drier seasons. Therefore, it is recommended that catch-pit abstraction is used to charge winter storage reservoirs which can subsequently be used as a resource in the drier summer months.

Since the first licence was issued several other water users in the area have expressed an interest in the catch-pit technique. Early indications suggest that when the catch-pits are managed appropriately the risk of saline pull-up is minimised. Therefore, it is highly likely that this method of abstraction will be the preferred and most acceptable technique/approach in the Holbeach Marsh area. It should be noted, however, that the salinity levels and depth of usable groundwater will vary with location. Consequently, each applicant/enquirer will have to undertake their own investigations to determine the levels of fresh groundwater available in their locality. They would also have to commission a Section 32 survey of water features on the site (see Section 4.1 for further details).

The long term sustainability of water abstraction in this area needs to be considered in relation to future sea level rise predictions. Further information about climate change and case studies of how to adapt to sea level rise and coastal change are available on our [climate change adaptation pages on gov.uk](https://www.gov.uk/government/collections/climate-change-adaptation-pages).

### 3.3. Other considerations for availability and reliability

We may have to add constraints to licences such as '[hands off flow](#)' (HoF) conditions to protect the environment and the rights of other abstractors. As a result, when we grant a licence, it doesn't mean that we guarantee a supply of water. These conditions specify that if the flow in the river drops below what's needed to protect the environment, abstraction must reduce or stop. So, in dry years, restrictions are likely to apply more often, which will affect the reliability of supply.

Whilst this document may say that water is available for abstraction, this doesn't guarantee that all applications will be successful. This is because we have to determine each application on its own merits, and local factors may mean we're either unable to grant a licence as applied for, or even at all.

New licences within an ALS are usually given a Common End Date (CED), which allows them to be reviewed at the same time. The expiration date applied to abstraction licences in the Holbeach Marsh area will depend upon which ALS area the abstraction falls within (see Map 1). The next CED for Welland ALS is 2026 and the subsequent one is 2038. The next CED for Nene ALS is March 2029 and the subsequent one is March 2041.

### 3.4. Impoundments

Applications for impoundments will be dealt with on a case by case basis. More information may be found on our [water management web pages on gov.uk](#).

## 4. How we manage abstraction in the Holbeach Marsh ALS

### 4.1. Local licensing principles for groundwater abstractions in the Holbeach Marsh area

#### **Applicants must complete a groundwater investigation**

Prior to applying for a groundwater abstraction licence, potential abstractors will need to carry out groundwater investigations to determine:

- Whether groundwater is available
- Whether the water is suitable for its intended purpose
- The impacts of abstraction on other water interests in the area.

To conduct a groundwater investigation a Groundwater Investigation Consent must be granted under Section 32/3 of the Water Resources Act 1991. Customers should speak to the local Groundwater and Contaminated Land team at the Environment Agency for further information and to obtain the relevant forms.

#### **Monitoring impact on surface drain levels**

The abstraction of groundwater from catch-pits could affect water levels in neighbouring drains. In this situation a local '[hands-off level](#)' (HoL) condition will need to be applied to the licence. This is a condition which allows the Environment Agency to reduce or stop abstraction when the water levels in the drain fall below a specified threshold (see Section 3.3). Where no local water level information is available the applicant may be required to install local gauge boards and monitor water levels to inform the setting of a local level condition.

## **Biodiversity and environmental enhancement**

Applicants are encouraged to design and construct catch-pits with a consideration for local biodiversity and environmental enhancement. Guidance can be found in [Thinking about an Irrigation Reservoir](#) (pages 14 & 15).

## **Monitoring of salinity (Chloride) levels**

It is in the interest of both the Environment Agency and landowners to prevent saline groundwater pull-up and soil salinisation. Therefore, any landowner granted an abstraction licence will be required to undertake suitable monitoring of the salinity levels of the water in the catch-pits. Licence holders will be required to send this information to the Environment Agency. Licences may contain a condition which restricts abstraction if the total dissolved solid concentration exceeds a specified threshold.

## **Protecting water levels in the aquifer**

To ensure that the background water levels in the aquifer are not adversely affected, it is likely that one or all of the following conditions will be applied to new abstraction licences:

- Catch-pit minimum water level conditions – applicants may be required to install local gauge boards and undertake suitable monitoring to ensure that water levels in the catch-pit do not fall below a certain level (to be agreed with the Environment Agency).
- Catch-pit recovery conditions (1) – applicants may be required to install appropriate equipment to measure the background water level in the aquifer. Abstraction may be limited to periods when the water level in the catch-pit is equal to or exceeds a certain water level in the aquifer (to be agreed with the Environment Agency).
- Catch-pit recovery conditions (2) – licences may contain a condition which requires abstractors to allow a certain number of days to pass since the end of the previous abstraction cycle before repeating abstraction from the same catch-pit (to be agreed with the Environment Agency). Over time there is likely to be limited upward creep of the saline layer. Consequently, protracted recovery periods for individual catch-pits may be necessary.

## **Additional controls**

There may be a requirement to introduce a tiered groundwater level control arrangement whereby newer licences are given more restrictive controls in order to protect other licenced users and the environment.

## **4.2. Local licensing principles for surface water abstractions in the Holbeach Marsh area**

We will consider proposals for surface water abstraction on a case-by-case basis following discussion with the local Internal Drainage Board (IDB). The following conditions will apply to all new surface water abstractions in the Holbeach Marsh area:

- Abstraction will be limited to periods of high flows and/or levels (normally the winter period);
- All licences will have a hands-off level/flow which will be set following discussion with the IDB.

## **Pre-application requirements**

In order to support a formal application for a surface water abstraction you are likely to be required to:

- Liaise with the South Holland IDB to discuss, and agree, the proposed means of abstraction. In most cases where an IDB drain is the source of supply the abstractor will be required to construct an off-take from the drain by means of a pipe and abstraction point set back a specified distance from the IDB drain. This arrangement will minimise disruption to the IDB in carrying out its maintenance and other flood risk management duties;
- Collect level (and/or flow) and salinity data at your proposed point of abstraction;
- Undertake an environmental survey to determine the presence of any environmental features which may require protection, in consultation with the local Fisheries, Biodiversity & Geomorphology team at the Environment Agency, and Natural England.

It is recommended that you discuss your proposed abstraction and confirm the necessary survey requirements with the relevant teams at the Environment Agency and staff at the local IDB before starting any pre-application surveys or monitoring.

### **Monitoring of salinity (Chloride) levels**

It is in the interest of both the Environment Agency and landowners to prevent saline groundwater pull-up and soil salinisation. Anyone granted a surface water abstraction licence may be required to undertake suitable monitoring of the salinity levels of the abstracted water. Licence holders will be required to send this information to the Environment Agency.

### **If you do not apply for a licence**

It's your responsibility to apply for a licence if and when you need one. It's an offence to abstract greater than 20m<sup>3</sup>/day without a licence. The Environment Agency may take [enforcement action](#) against you if you do not apply.

## **5. Managing existing licences**

### **5.1. Water rights trading**

We want to make it easier to trade water rights. A water rights trade is where a person sells all or part of their water right, as defined by their abstraction licence(s), to another person on a permanent or temporary basis. In the majority of cases a trade will involve a change in abstraction location and/or use which we will need to approve through the issue or variation of abstraction licences.

In licensing trades, as with new abstraction licences, we need to make sure that we don't cause any deterioration in water body status both within the water body / bodies where the trade will take place and to downstream water bodies.

To find out more about licence trading please go to our [water management web pages on gov.uk](#)

### **5.2. Regulating previously exempt abstraction**

As the abstraction licensing system in England and Wales developed over the past 50 years, certain abstractions have remained lawfully exempt from licensing control. This meant that unlimited supplies of water could be abstracted, even in areas that are water stressed.

This means that those exempt abstractions could potentially take unlimited amounts of water, irrespective of availability and without regard to impacts on the environment or other abstractors.

Following two public consultations Government have introduced new Regulations to take effect from 1st January 2018. The Water Resources (Transitional Provisions) Regulations 2017 have removed the majority of previous exemptions from licensing control, and previously exempt abstractors will now require a licence to lawfully abstract water.

The main activities affected are:

- transferring water from one inland water system to another in the course of, or as the result of, operations carried out by a navigation, harbour or conservancy authority;
- abstracting water into internal drainage districts;
- dewatering mines, quarries and engineering works, except in an emergency;
- warping (abstraction of water containing silt for deposit onto agricultural land so that the silt acts as a fertiliser);
- all forms of irrigation (other than spray irrigation, which is already licensable), and the use of land drainage systems in reverse (including transfers into managed wetland systems) to maintain field water levels;
- abstracting within currently geographically exempt areas, including some rivers close to the borders of Scotland; and
- abstractions covered by Crown and visiting forces (other than Her Majesty the Queen and the Duchies of Cornwall and Lancaster in their private capacity).

Where we have details of these abstractions, we've included them in our assessments to consider how they impact on the catchment.

# Appendix A - Level dependent environments

Level dependent environments are characterised by a network of river channels flowing above the level of the surrounding land. The low-lying land has a network of drainage ditches, which remove water from the low-lying land into the main river channels during high flows and provide an irrigation resource during the summer/low flows (see Figure A.1).

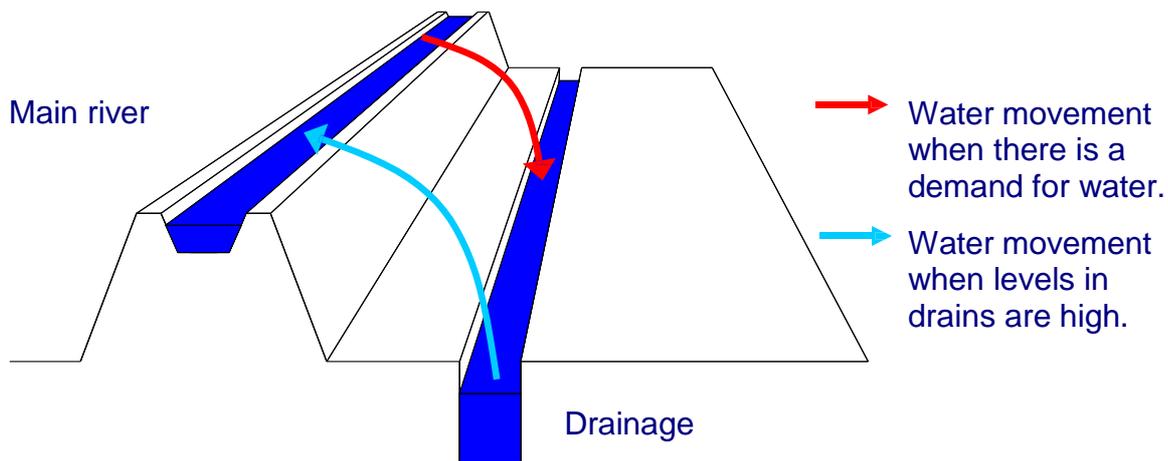


Figure A.1 The main features of a characteristic level dependent environment.

Both the Welland and the Nene ALS contain Level Dependent Environments (LDE). Each LDE has been divided into units, known as Level Dependent Management Units (LDMU). Internal Drainage Boards (IDBs) are responsible for maintaining the drains and controlling the water levels in each LDE/LDMU.

We have completed a water resource assessment on each of the units. For more information about the LDMUs in the Welland and Nene ALS areas please see the relevant ALS document available [here](#).

## 6. List of abbreviations

### **ALS**

Abstraction Licensing Strategy.

### **AP**

Assessment Point.

### **CED**

Common End Date.

### **Defra**

Department of Environment Food and Rural Affairs.

### **EFI**

Ecological Flow Indicator.

### **GEP**

Good Ecological Potential.

### **GES**

Good Ecological Status.

### **GW**

Groundwater.

### **HMWB**

Heavily Modified Water Body.

### **HoF**

Hands off Flow.

### **HoL**

Hands off Level.

### **MI/d**

Megalitres per day.

### **SAC**

Special Areas of Conservation.

### **SPA**

Special Protection Areas.

### **SSSI**

Sites of Special Scientific Interest.

## **UKTAG**

United Kingdom's Technical Advisory Group.

## **WB**

Water body.

## 7. Glossary

### Abstraction

Removal of water from a source of supply (surface or groundwater).

### Abstraction licence

The authorisation granted by the Environment Agency to allow the removal of water.

### Assessment point

A significant point on a river, often where two major rivers join or at a gauging station.

### Catchment

The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.

### Consumptive abstraction

Abstraction where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use. For example for the use of spray irrigation.

### Discharge

The release of substances (for example, water, treated sewage effluent) into surface waters.

### Environmental flow indicator

Flow indicator to prevent environmental deterioration of rivers, set in line with new UK standards set by [UKTAG](#).

### Groundwater

Water that is contained in underground rocks.

### Hands off flow

A condition attached to an abstraction licence which states that if flow (in the river) falls below the level specified on the licence, the abstractor will be required to reduce or stop the abstraction.

### Hands off level

A river or borehole (groundwater) level below which an abstractor is required to reduce or stop abstraction.

### Impoundment

A structure that obstructs or impedes the flow of inland water, such as a dam, weir or other constructed works.

### Surface water

This is a general term used to describe all water features such as rivers, streams, springs, ponds and lakes.

## Water body

Units of either surface water or groundwater which we use to assess water availability.

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