

Supporting Guidance (WAT-SG-70)

Sector-specific Guidance: Agriculture

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Update Summary

Version	Description
v1.0	First issue for Water Use reference. Updates and replaces information held in: <i>WAT-SG-04: Sector-specific Guidance (Section 3)</i>
v2.0	Doc links revised to new website, new template applied, revised example link
v3.0	Expired CMS links reviewed and updated.

Notes

References: Linked references to other documents have been disabled in this web version of the document. See the References section for details of all referenced documents.

Printing the Document: This document is uncontrolled if printed and is only intended to be viewed online.

If you do need to print the document, the best results are achieved using Booklet printing or else double-sided, Duplex (2-on-1) A4 printing (both four pages per A4 sheet).

Always refer to the online document for accurate and up-to-date information.

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1. Background

Water is fundamental for many agricultural activities such as irrigation, livestock watering and crop spraying. Irrigation represents the most intensive use of water by agriculture and can lead to significant impacts on the water environment as it tends to take place at the very time of year when surface water flows are at their lowest. A large percentage of the irrigation that takes place in Scotland is for potatoes although irrigation is used for other crops such as soft fruits and vegetables. Some of the main irrigation areas are situated along the East Coast of Scotland in areas such as East Lothian, the Borders, Angus, and Fife.

2. Calculating water demand

As there has been no requirement in the past to record water use, farmers will not necessarily know the volume of water they need to apply for for a given activity. While you should not act as a technical consultant you can advise on typical water demand for specific agricultural activities such as crop irrigation and stock watering.

2.1 Irrigation

While the capacity of different pumps will vary, on **average** a rain gun will pump at $60\text{m}^3/\text{hour}$ (for the typical equipment used in Scotland, with a 25-26 mm nozzle). If the farmer does not know the capacity then it may be possible to ascertain this by looking at the manufactures specifications for the pump. By considering the hours a rain gun is required to pump each day the daily demand can be calculated.

Example 1

The pump capacity of farmer's rain gun is $60\text{m}^3/\text{hour}$.

To meet peak irrigation requirements he has to pump for 20 hours a day.

His daily peak demand is therefore $60\text{m}^3 \times 20 = 1,200\text{m}^3/\text{day}$

Demand can also be estimated by considering the water requirements of particular crops and varieties. These tend to be given as depths in mms on an annual basis e.g 100mm per season. Farmers will often know the water requirements of particular crops and varieties, however, SEPA has also commissioned a study to investigate the optimum use requirements of different crops. The final *Silsoe Report* (Abstraction Controls for Agricultural Irrigation in Scotland) details the water demands of a range of crops.

By considering the water demands of a given crop and the area being irrigated it is possible to calculate annual water demands.

Example 2

A farmer is proposing to grow 15 hectares of a given variety of potatoes with a water demand of 100mm per season.

1mm per hectare = 10m^3 therefore his annual water demand is:

$15 \times 100 \times 10 = 15,000\text{m}^3/\text{season}$.

2.2 Livestock

The water demands of livestock depend on a variety of factors including diet and husbandry methods. Research has been undertaken to calculate the average water demand of different livestock. This can be used as the basis for calculating the overall demand of a livestock unit. A table of daily drinking

water requirements for different classes of stock can be found in Appendix 1.

Example 3

A farmer keeps 250 dairy cattle. One dairy cow is estimated to require 50 litres per day.

His daily water demand can therefore be estimated as:

$250 \times 50\text{litres} = 12,500 \text{ litres or } 12.5 \text{ m}^3/\text{day}$

3. Frequently Asked Questions

Who should apply for the licence?

The farmer owning the land to be irrigated or the farmer renting the land to be irrigated?

Farmers will not necessarily own the land which they are irrigating but may rent it. In this instance either the farmer renting the land and abstracting the water or the land owner can apply for an authorisation to abstract water. This is a business decision to be made by the parties involved and SEPA should not advise one way or the other. In some instances the landowner may wish to keep the authorisation to abstract water with the land, in other instances they may not wish to be held responsible for abstraction activities they themselves are not undertaking. Any licence application must have one responsible person identified on the application form. SEPA should make clear the implications of being the responsible person on the licence i.e that they are the responsible person if the conditions of the licence are breached. The application form is designed so that the bill for the annual subsistence charges does not necessarily need to be sent to the responsible person and there is the flexibility to transfer the authorisation to a different responsible person which would involve an administrative transfer application charge.

Can I move my irrigation pump along a stretch of river to enable me to reach the different fields I am irrigating?

Yes there is flexibility for farmers to apply to abstract from a stretch of river along which they can move their irrigation pumps. Currently there is no fixed limit as to the length that this stretch can be. However, such stretches will only be accepted by SEPA where the available water resource is broadly consistent and therefore only one environmental impact assessment will be required for the stretch. This means that there should be no significant changes in ecological sensitivity along the stretch or significant discharges, incoming tributaries or further abstractions. Multiple abstractions from a single stretch will be subject to a single application fee as only one environmental impact assessment will be required.

If a farmer wishes to apply to abstract from a stretch of river they must fill in the grid references of the upstream and downstream limits of the stretch on the application form.

Do I need an authorisation for abstracting from a storage tank?

No because the storage tank is not part of the water environment. However, an authorisation is required for the abstraction of water from the water environment that has been used to fill the tank. So for example if a farmer fills a storage tank on the farm from a spring then an authorisation would be required for the abstraction from the spring.

Is the water I abstract for domestic supply on the farm covered by the regulations?

Yes, all abstractions from the water environment are covered by the regulations. However, if you are abstracting less than 10m³/day then you are required to follow General Binding Rules (GBRs) but are not required to apply to SEPA. As a general rule 1 person uses 200litres per day and therefore up to 50 people can be supplied before an application needs to be made to SEPA. The Local Authority should be notified of any private water supply abstractions to ensure environmental health requirements are met.

Does each abstraction point require a different licence application?

It is possible to group associated activities within one licence application. Multiple abstractions can be covered by a single licence if they are **operated as a single scheme**. However, if activities are widely spread geographically or not part of a single scheme they will have to be covered by separate licences. In most instances multiple abstractions on a single farm will be covered by a single licence. In neighbouring farms operated by the same person where one responsible person can be identified on the application form, it should also be possible to group the activities into a single licence **where they are operated as one unit**. This latter instance may include a number of neighbouring farms where one potato merchant is responsible for all the irrigation activities. If a farmer has land across a wide geographic area around which he moves his irrigation equipment and is able to be the responsible person for all abstraction points then this is effectively operating as a single scheme and they could apply for a single licence. In addition, a number of mobile plants operated by one person or by one company can also apply under a single application. Many farm businesses operate a number of different farms across Scotland. Unless these farms operate as a single scheme i.e sharing irrigation equipment and one responsible person can ensure conditions are met at all sites then a separate licence application should be made for each. Therefore different farm units under one business that effectively operate in isolation from each other cannot apply for a single licence.

Will I be charged for an all year round abstraction if I abstract the majority of water in the winter to fill an off line winter storage pond and then top up in the summer?

Provided that 75% of the total volume of water abstracted is done so in the winter then the winter only seasonality factor will apply. If a pond is filled by land drainage or groundwater seepage then the abstraction from the pond will be regulated but the winter only seasonality factor will apply.

Can I abstract from a borehole put the water into a watercourse and then abstract the water further downstream?

If an abstraction is used to supplement the flow in a river and this additional flow is removed further downstream then only one application is required. However, while you would only be charged for 1 abstraction point (this applies to application and subsistence charges) both abstractions (the borehole and the river abstraction) would need to be regulated. For this to apply, it would be necessary to be able to demonstrate that the volume of water you were abstracting from the water course was the same as that which was being discharged into the burn from the borehole. If you are abstracting more from the burn than is being supported by the groundwater abstraction then an additional abstraction application is required. You will be required to make the operation clear on the application form and include the point on the burn where the water from the borehole is finally being abstracted from.

I have a number of points on the farm which I need to abstract from but only one irrigation pump. How will this be regulated?

Where an abstraction activity is mobile and moves from site to site you may apply for a licence that refers to the equipment and the abstraction sites. To apply for a mobile plant licence you will need to specify the maximum daily volume which the pump can abstract and the list the sites where the plant will be used.

Each abstraction site counts towards the number of abstractions factor within the subsistence charging scheme. It is important to note that adding more than 5 sites to the mobile plant licence will double the cost of the annual subsistence.

You should apply for the peak daily abstraction volume from each abstraction point. However, your subsistence charge will be calculated on the peak daily volume you are capable of abstracting with the mobile irrigation plant.

Example 4

A farmer wishes to have the flexibility to abstract from 3 different points on his farm but only has one irrigation pump. The peak daily irrigation demand requires him to pump for 20 hours and his pump capacity is $60\text{m}^3/\text{hour}$.

The farmer should therefore apply for one licence with a maximum peak daily abstraction of $1,200\text{m}^3/\text{day}$ for each abstraction point.

However, his subsistence charge will be calculated on a daily figure of $1,200\text{m}^3/\text{day}$ and not $3 \times 1,200\text{m}^3/\text{day}$.

Will I be able to add additional abstraction points to my licence in the future?

Yes, if you wish to add additional abstraction points to a mobile plant licence in the future then you can apply to add a site. There is a charge for each additional abstraction point as indicated under Administrative Variation in the *Water Environment (Controlled Activities) Charging Scheme*. As the number of abstraction sites listed in the licence will affect the subsistence charge, any sites no longer being used should be removed from the licence. There is no charge for removing sites.

For non-mobile plant licence then the addition of an abstraction point would be a technical variation and charged at 75% of the full application fee for that activity.

Will I be charged for abstracting out of a winter storage pond?

SEPA will distinguish between on-line and off-line ponds also known as impoundments (see definitions below). Abstractions of water stored in off-line ponds and artificial storage ponds that receive their inflow from an already authorised abstraction will **not** require an authorisation. However, an abstraction authorisation is required for abstraction from a winter storage pond where a dug pond collects water from field drains and/or groundwater and is not supplied by an already authorised abstraction. The charge for this abstraction would be restricted to the winter rate.

Will I be required to meter my abstraction in the future?

All licences will need to monitor in some way the volume of water abstracted from key points and this will be a condition of the licence. This information will then be required to be fed back to SEPA.

4. Definitions

4.1 Off- line and On-line impoundments

On-line impoundments hold back flows in wetlands, rivers, lochs and estuaries and consequently affect downstream water flows; sediments transport and migration of fish.

Off-line impoundments are built to store water (including surface water run-off, groundwater or land drainage) and do not hold back flows. Off line impoundments do not require an impoundment authorisation.

Land drainage is a series of subsoil pipes or ditches, which are designed to drain an area of land to allow development or for agricultural use.

The installation and operation of land drainage will not be regarded as an abstraction, as CAR does not cover land drainage activities. However, any abstraction or diversion of the water collected through land drainage will be regarded as an abstraction and therefore will be subject to control under CAR. Therefore land drainage used to fill a storage pond and then abstracted for irrigation would be covered by regulations and charges.

The abstraction from the pond would be regulated but for charging purposes the winter only seasonality factor would apply. (see 2.3.10).

More detailed information on charges can be found in the *Water Environment (Controlled Activities) Charging Scheme*.

Appendix 1: Daily Drinking Water Requirements

Table 1 Estimate of daily drinking water requirements for different classes of stock

Livestock Type		Diet	Water Use (approx.) per animal, per day	
			Litres	Gallons
Dairy ¹	Cow (in milk 25l/d)	Silage diet	60	13.2
		Hay diet	92	20.2
	Pregnant dry cows	Silage diet	20	4.4
		Hay diet	46	10.1
Beef ¹	Autumn calving suckler cow (650kg)	Mostly silage diet	27	5.9
		Mostly straw diet	69	15.2
	Spring calving suckler cow (650kg)	Mostly silage diet	16	3.5
		Silage/straw mix	34	7.5
		Mostly straw diet	55	12.1
	Store medium steer (350kg)	Mostly silage diet	15	3.3
		Mostly straw diet	38	8.4
	Finishing medium steer (500kg)	Mostly silage diet	29	6.4
		Mostly straw diet	55	12.1
	Intensive medium bull (500kg)	Straw/barley mix	52	11.4
Pigs ² : Indoor housed ³	Newly weaned		1 to 1.5	0.2 to 0.3
	Weaners up to 20kg		1.5 to 2	0.3 to 0.4
	Growers (20-40kg)		2 to 5	0.4 to 1.1
	Finishers (40-100kg)		5 to 6	1.1 to 1.3
	Dry sows and boars		5 to 8	1.3 to 1.8
	Pregnant sows		5 to 8	1.3 to 1.8
	Farrowing sow and litter (per farrowing place)		15 to 35	3.3 to 7.7

Appendix 1: Daily Drinking Water Requirements

Poultry ¹ : Indoor housed	Poultry (chicken and ducks) layers		0.3	0.07
Sheep ¹	Pregnant Ewe (70kg) Twins, 4w before lambing	Silage diet	3	0.66
		Hay diet	6	1.3
	Intensively finished lamb	Feed	2	0.44

1. Dairy, Beef and Sheep values supplied by Colin Morgan, SAC. Based on temperatures below 160C.
2. Pig data taken from welfare codes.
3. For outdoor housed pigs, add 50% to indoor drinking figures

References

NOTE: Linked references to other documents have been disabled in this web version of the document.

See the Water >Guidance pages of the SEPA website for Guidance and other documentation (www.sepa.org.uk/water/water_regulation/guidance.aspx).

All references to external documents are listed on this page along with an indicative URL to help locate the document. The full path is not provided as SEPA can not guarantee its future location.

Silsoe Report, *Abstraction Controls for Agricultural Irrigation in Scotland*.
Knox, J.W., Weatherhead, E.K. and Brewer, T.R. 2004

Water Environment (Controlled Activities) Charging Scheme
(www.sepa.org.uk)

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