



# Smarter Water Catchments

## Evenlode Catchment Fund



## Acknowledgements

The measures and specifications set out in this handbook draw on a wide range of sources. These include the Countryside Stewardship and other agri-environment schemes run by Natural England and water companies (including South Staffs Water and Severn Trent Water); relevant CIRIA manuals and guidelines; practical environmental management guides (e.g. Wildfowl and Wetlands Trust wetland manuals) and specialist academic literature. These sources of information have been invaluable in preparing this document.

# Contents

## Acknowledgements

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<b>1. Introduction</b>	<b>3</b>
Smarter Water Catchments in the Evenlode	3
The Evenlode Catchment Fund	4
The handbook	4
Terms and Conditions of the Catchment Fund	4
How to apply to the Catchment Fund	4

---

<b>2. Summary of measures and rates</b>	<b>5</b>
---	----------

---

<b>3. Specification for operational measures</b>	<b>8</b>
01. Reversion to different vegetation	8
01.1. Arable reversion to grassland (or other lower P agricultural practice)	8
01.2. Two-year sown legume fallow	9
02. Change cultivation and tillage practices	10
02.1. Cultivate and till across slope	10
03. Protect soils over winter	10
03.1. Winter cover crops	10
04. Using vegetation (buffer strips) to intercept water, sediment and nutrients	11
04.1. 6m+ buffer strip	11
04.2. 12m+ watercourse buffer strip	12
04.3. In-field grass strip	12
04.4. Take small areas out of management	13
05. Water features to intercept water, sediment and nutrients	14
05.1. Management of wetlands and swales	14

---

<b>4. Specification for capital measures</b>	<b>15</b>
C1. Change the way P is applied	15
C1.1. Farm nutrient management plan with a focus on phosphorus	15
C2. Improve soil structure and organic matter	15
C2.1. Cultivate compacted tillage soils	15
C3. Improve management of manure in animal housing and yards (clean and dirty water management)	16
C3.1. Outdoor concrete yard renewal	16
C3.2. Underground drainage pipework: yard works for clean and dirty water separation	17
C3.3. Inspection pit/chamber	17
C3.4. Rainwater goods (e.g. downpipes and gutters)	17
C3.5. Below ground storage tank	18
C3.6. Above ground storage tank	18
C3.7. First flush rainwater diverters and filters	19

# Contents

C4. Improve how manure (and silage) is stored	19
C4.1. Dedicated manure (and silage) storage facilities	19
C5. Reduce runoff from tracks and gateways	20
C5.1. Gate	20
C5.2. Gateway relocation	20
C5.3. Resurfacing gateways	21
C5.4. Livestock and machinery hardcore track	21
C5.5. Cross drains and cross humps	22
C5.6. Installation of piped culvert in ditches	22
C6. Water features to intercept water, sediment and nutrients	23
C6.1. Creation of wetlands	23
C6.2. Creation of swales	24
C6.3 Creation of ponds and scrapes	25
C6.4 Creation of bunds	26
C7. Keep stock away from watercourses	26
C7.1. Post and wire fencing	26
C7.2. Sheep netting fencing	27
C7.3. Livestock trough and associated pipework	27
C7.4. Hard but permeable base for livestock troughs	28
C7.5. Pasture pump and associated pipework	28
C7.6. Solar panel pump	29
C7.7. Drinking water pipework	29
C8. In channel measures to slow flow	29
C8.1. Small leaky wood dam	30
C8.2. Large leaky woody dam	30
C8.3. Check dam	31

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## 5. Permissions, approvals or consents 32

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### Appendix A – Terms and Conditions

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### Appendix B – How to apply

# 1. Introduction

## Smarter Water Catchments in the Evenlode

We have set up Smarter Water Catchments in the Evenlode to encourage water sensitive farming and reduce the loss of phosphorus from fields and farmyards to watercourses.

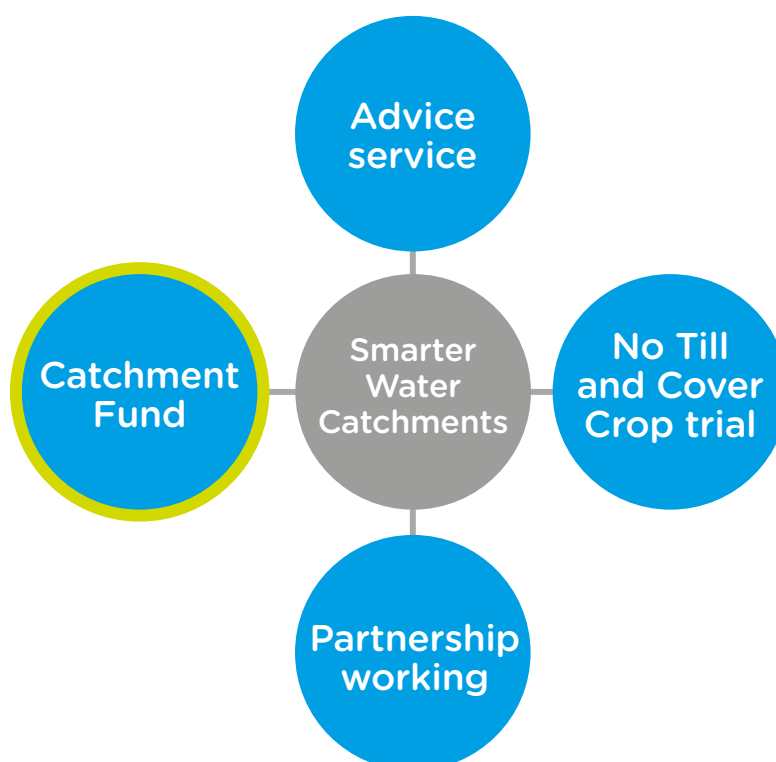
Excessive levels of phosphorus in river water can damage the environment, for instance by generating algal blooms. For this reason the Water Framework Directive sets national limits for phosphorus concentration in our natural waters.

Human and animal waste as well as fertilisers are the main sources of phosphorus in natural waters.

Water companies have historically relied on wastewater treatment to remove phosphorus before it reaches rivers. This can be expensive and resource intensive. We would

like to work in partnership with farmers and other groups responsible for managing raw water in a complementary approach called catchment management. We are keen to promote and support farming practices that are beneficial for farmers, the water industry, the environment and local inhabitants.

Smarter Water Catchments in the Evenlode catchment has four components. This handbook sets out how farmers can apply to the Catchment Fund component.



The four components of Smarter Water Catchments in the Evenlode

## The Evenlode Catchment Fund

A Catchment Fund has been set up by Thames Water to fund improvements to farms and farming operations that reduce the loss of phosphorus to watercourses. It is voluntary and not all applications will be successful.

Whilst there are already government grants in place to support phosphorus reduction measures, the Catchment Fund brings together all the measures in one place, and incentivises those that are particularly effective at managing phosphorus. It has been set up to complement government grants by increasing funding for phosphorus sensitive farming and making it more accessible in the Evenlode catchment.

Following the successful pilot of this scheme in 2017, we are now opening applications to other parts of the Evenlode.

## The handbook

This handbook sets out:

- The purpose of the Catchment Fund.
- The measures promoted by the Catchment Fund to reduce the amount of phosphorus lost from fields and farmyards to watercourses.

- How to apply to participate in the Catchment Fund.
- The terms and conditions that govern the application process and the operation of the Catchment Fund.

## Terms and Conditions of the Catchment Fund

The terms and conditions under which the fund will be operated can be found in Appendix A. They set out useful information such as how much grant is available, eligibility criteria, which applications are more likely to be funded as well as the form of agreement used by the fund.

## How to apply to the Catchment Fund

A link to the Catchment Fund application form is found in Appendix B of this handbook.

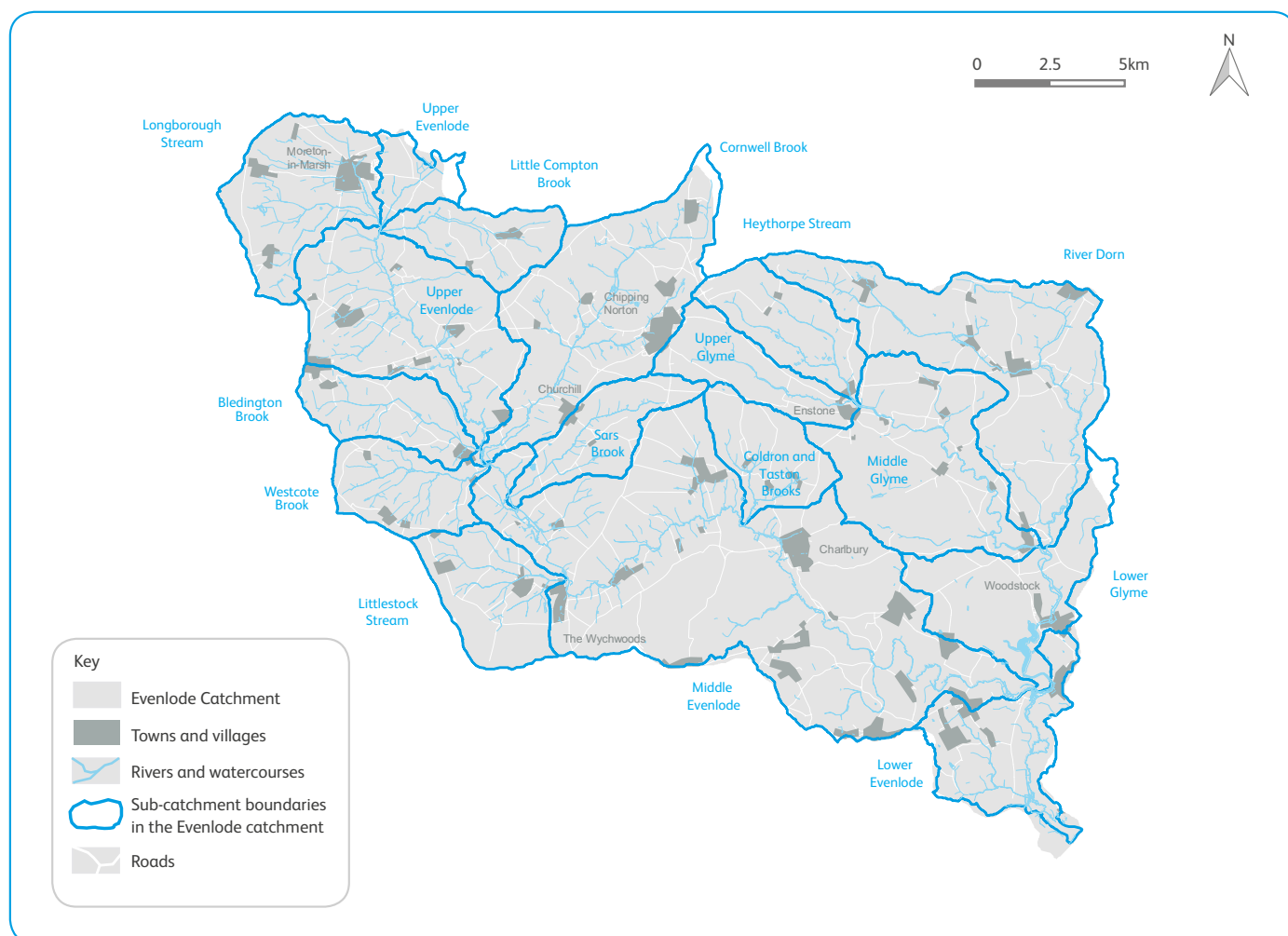


Figure 1.1: Location of Evenlode Catchment and waterbodies

## 2. Summary of measures and rates

The Catchment Fund provides grants for one-off improvements to farm infrastructure (commonly referred to as capital investment). It also makes annual payments to support changes in operational practices on your farm; operational payments can be made for up to three years, and are subject to annual farm checks.

Figure 2.1 summarises typical measures promoted by government schemes to manage the sources, pathways and receptors of phosphorus in a river catchment. It also highlights the operational and capital measures that are most effective at reducing phosphorus loss. These are the measures that the Evenlode Catchment Fund is initially promoting. Technical specifications for these measures are provided in sections 3 and 4 of this handbook.

If you want to propose alternative measures that are effective at managing the sources, pathways and receptors of phosphorus on your farm, we encourage you to set out your ideas in the farmer innovation section of the application form.

Measures promoted by the fund are kept under review and may change. We will do our best to advise you of any such changes, but you should also check with our Agricultural Advisor.

Table 2.1: Operational measures proposed under the Catchment Fund

Code	Measure	Rate £	Unit
<b>01</b>	<b>Reversion to different vegetation</b>		
01.1	Arable reversion to grassland (or other lower P agricultural practice)	311	per ha / yr
01.2	Two year sown legume fallow	522	per ha / yr
<b>02</b>	<b>Change cultivation and tillage practices</b>		
02.1	Cultivate and till across slope	20	per ha / yr
<b>03</b>	<b>Protect soils over winter</b>		
03.1	Winter cover crops	110	per ha / yr
<b>04</b>	<b>Using vegetation (buffer strips) to intercept water, sediment and nutrients</b>		
04.1	6m+ buffer strip	353	per ha / yr
04.2	12m+ watercourse buffer strip	512	per ha / yr
04.3	In-field grass strip	557	per ha / yr
04.4	Take small areas out of management	370	per ha / yr
<b>05</b>	<b>Water features to intercept water, sediment and nutrients</b>		
05.1	Management of wetlands, ponds, swales and scrapes	site specific	
<b>06</b>	<b>Farmer innovation</b>		
06.1	Alternative ways of reducing the amount of phosphorus lost from fields and farmyards to watercourses can be proposed as “Farmer Innovation”	site specific	

Table 2.2: Capital measures proposed under the Catchment Fund

Code	Measure	Rate £	Unit
<b>C1</b>	<b>Change the way P is applied</b>		
C1.1	Farm nutrient management plan with a focus on P	500	item
<b>C2</b>	<b>Improve soil structure and organic matter</b>		
C2.1	Cultivate compacted tillage soils	20	per ha
<b>C3</b>	<b>Improve management of manure in animal housing and yards (clean and dirty water separation)</b>		
C3.1	Outdoor concrete yard renewal	27.2	per m <sup>2</sup>
C3.2	Underground drainage pipework	5.5	per m
C3.3	Inspection pit / chamber	200	per unit
C3.4	Rainwater goods (e.g. downpipes and gutters)	11.5	per m
C3.5	Below ground storage tank	350	per m <sup>3</sup>
C3.6	Above ground storage tank	100	per m <sup>3</sup>
C3.7	Flush rainwater diverters and filters	125	unit
<b>C4</b>	<b>Improve how manure (and silage) is stored</b>		
C4.1	Improvements to dedicated manure (and silage) storage facilities	site specific	
<b>C5</b>	<b>Reduce runoff from tracks and gateways</b>		
C5.1	Gate	150	item
C5.2	Gateway relocation	340	item
C5.3	Resurfacing gateways	92	item
C5.4	Livestock and machinery hardcore track	33	per m
C5.5	Cross drains / cross humps	235	item
C5.6	Installation of piped culvert in ditches	340	item
<b>C6</b>	<b>Water features to intercept water, sediment and nutrients</b>		
C6.1	Creation of wetlands	site specific	
C6.2	Creation of swales		
C6.3	Creation of ponds and scrapes		
C6.4	Creation of bunds		
<b>C7</b>	<b>Keep stock away from watercourses</b>		
C7.1	Post and wire fencing	4	per m
C7.2	Sheep netting fencing	4.9	per m
C7.3	Livestock trough and associated pipework	110	item
C7.4	Hard but permeable base for livestock trough	110	item
C7.5	Pasture pump and associated pipework	220	item
C7.6	Solar panel pumps	660	item
C7.7	Drinking water pipework	2.7	per m
<b>C8</b>	<b>In channel measures to slow flow</b>		
C8.1	Small leaky woody dam	462	item
C8.2	Large leaky woody dam	764	item
C8.3	Check dams	70	item
<b>C9</b>	<b>Farmer Innovation</b>		
C9.1	Alternative ways of reducing the amount of phosphorus lost from fields and farmyards to watercourses can be proposed as 'Farmer Innovation'		



			Evenlode Catchment Fund	
			Operational measures	Capital measures
SOURCE	1. CHANGE LAND USE	Reversion to different vegetation (grassland, woodland)	01	
		Produce energy instead of food (biomass, solar)		
		Fine tune agricultural activity with land risk		
	2. CHANGE THE WAY P APPLIED	Change the way manure is applied		C1
		Change the way fertiliser is applied		C1
	3. CHANGE THE WAY SOIL IS MANAGED	Modify field drainage		
		Change cultivation and tillage practices	02	
		Improve soil structure and organic matter		C2
		Protect soils over winter (e.g. cover crop)	03	
	4. CHANGE THE WAY LIVESTOCK IS MANAGED	Reduce or change stocking rates / periods		
		Change livestock feeds		
		Manage poaching		
5. CHANGE THE WAY MANURE IS MANAGED	Improve management of manure in animal housing and yards		C3	
	Improve how manure (and silage) is stored		C4	
PATHWAY	6. INTERCEPT WATER, SEDIMENT, NUTRIENTS	Reduce runoff from tracks and gateways		C5
		Using vegetation (buffer strips)	04	
		Using/managing water features (ponds, wetlands, ditches)	05	C6
		Keep stock away from watercourses (fences, tracks, troughs)		C7
RECEPTOR	7. REDUCE ENVIRONMENTAL EFFECTS (MAIN RIVER)	Reconnecting floodplain		
		In channel measures to slow flow		C8
		Capture zones (e.g. floodplain ponds)		
		Trees on river banks		

Figure 2.1: Sources, pathways and receptors of Phosphorus in a catchment – linked to measures promoted in this manual

## 3. Specification for operational measures

This section provides the technical specifications for measures that change operational practices on a farm. The Evenlode Catchment Fund will provide annual payments for up to three years to implement and maintain these measures; operational measures are also subject to annual farm checks.

### O1. Reversion to different vegetation

#### O1.1. Arable reversion to grassland (or other lower P agricultural practice)

##### Objectives

A permanent vegetation cover minimises the risk of soil erosion and loss of associated particulate phosphorus in surface runoff. The measure is moderately effective in reducing particulate phosphorus.

In addition, the measure can also reduce nitrate leaching, and provide ecological benefits such as re-creation of species-rich grassland, habitat creation for birds and reduced usage of pesticides.

The work covered by this measure involves changing from an arable crop to a permanent grassland.

##### Specifications

The land may be used for low fertiliser input grazing and/or hay/haylage/silage production. For wider environmental benefits, such as habitat creation, semi-improved grassland or meadows may also be created.

The following bullets set out the key principles. However, specialist advice should be sought on the location, type of grassland and management options. Your Agricultural Advisor can provide advice free of charge.

Location:

- Cultivated land prone to losses of phosphorus through soil erosion and surface runoff, and on flood plain areas.



Arable land reverted to ley grassland in the Evenlode catchment. Photograph courtesy of Evenlode Catchment Partnership.

Requirements:

- Avoid over-grazing and under-grazing across the whole grazed area of the holding. Stock must be distributed across the grazed area of the holding to ensure this is the case.
- If the land is grazed, appropriate measures must be in place to avoid poaching and any watercourses must be fenced off (see related measures).
- When preparing a seedbed, remove any subsoil compaction, except on archaeological features.
- Control weeds and cut regularly in the first 12 to 24 months of establishment to encourage grasses to tiller.
- Where cutting, avoid doing so when the soil is wet, to prevent compaction.
- Remove any cuttings that will otherwise damage the sward.
- The grass sward should be established by 1 October to ensure a vegetation cover over winter and to avoid soil compaction.
- Once the grass sward has established, do not plough, cultivate or re-seed.
- Maintain grass at all times.
- Where scrub is present, prevent further encroachment by grazing, mowing or topping.
- Do not supplementary feed.
- You may apply up to 12.5 tonnes/ha (5 tonnes/acre) of Farm Yard Manure (FYM) a year, but only where the grassland is regularly cut. Only apply FYM during the growing season, provided no birds are nesting in the field and ground conditions are dry enough to prevent soil compaction. No other type of fertilisers or manures may be applied. If your current manure and fertiliser regime is less than this, you must not increase applications.
- Do not apply any manure between 15 August and 1 February.
- You may continue adding lime, where this is your regular practice.
- Only apply herbicides to spot-treat or weed-wipe for the control of injurious weeds (i.e. creeping and spear thistles, curled and broad-leaved docks or common ragwort); invasive non-native species (e.g. Himalayan balsam, rhododendron or Japanese knotweed); or bracken.

### Related measures

- The measure can be combined with C7.1 (Post and wire fencing) and C7.2 (Sheep netting fencing). C7.3 (Livestock trough and associated pipework), C7.4 (Hard base for livestock drinkers), C7.5 Pasture pump and associated pipework), C7.6 (Solar panel pumps and associated pipework), C7.7 (drinking water pipework), C5.1 (Gate), C5.2 (Gateway Relocation) and C5.3 (Resurfacing gateways).

### Exclusions

- N.A.

## O1.2. Two-year sown legume fallow

### Objectives

This measure is effective against surface water run-off and phosphate loss as it provides constant ground cover for two years. The measure is moderately effective in reducing particulate phosphorus.

It also provides food for farmland wildlife, such as pollen and nectar for pollinators, and invertebrate chick food for farmland birds. It can also be a useful part of a rotation aimed at reducing blackgrass populations.

The work covered by this measure involves converting an area of arable crop to a two-year sown legume fallow.

### Specifications

This measure can be used on:

- Whole or part parcel rotational arable land.
- Temporary grassland.

### Requirements:

- Establish a mixture of grass and flowering species as specified in the “What to sow” section as soon as possible after harvest and before 7 September, in year 1 and year 3 of the agreement.
- Cut at least twice during the year as the mixture is establishing to stop blackgrass heading.
- Do not cut after the end of October.
- In the second year after establishment, cut once before the end of March if blackgrass is present.
- Return the measure area to the arable rotation from 15 August in the second year after establishment.
- Do not graze.

How to choose the right location:

This measure works well on most soil types where it can help to reduce the amount of blackgrass and increase wildlife resources. It works best where some blackgrass germinates after cultivation in the autumn and more can grow from the seedbank during the winter and following spring. Mow the area as often as is needed to prevent the blackgrass from seeding.

Size of blocks or plots:

Plan this measure into the rotation, selecting fields on a part or whole-field scale. This will give most benefits for blackgrass reduction and biodiversity. Spread the legume fallow areas widely across the farm to help connect insects with other farm habitats.

What to sow:

Sow a mixture in the autumn based on the suggestions in Table 1.1, at an overall seed rate of around 30kg per ha, and retain for 2 years before re-establishment.

When soils are dry at sowing, substituting some of the ryegrass with cocksfoot (up to 30 %) can help to establish ground cover more rapidly.

When to sow:

Establish the legume fallow as soon as possible after harvest in year 1 and year 3 of the agreement (ideally by the end of August).

When to cut:

Cut at least twice in the first year following the autumn sowing to control emerging blackgrass. But be prepared for subsequent cuts to be as close as 3 weeks apart as blackgrass re-heads more rapidly after each cut. Cutting before the end of March in year 2 controls any remaining blackgrass, before the legume fallow mixture grows rapidly from April. The aim of this measure is to provide an abundant supply of pollen and nectar-rich flowers, and this cannot be achieved if the measure area is grazed.

Return the measure area to crop production:

Spray the legume fallow mix with a non-selective herbicide if needed, before the area is cultivated for the next crop.

### Related measures

- N.A.

### Exclusions

- N.A.

Table 1.1: Suggested seed mixture for two years sown legume fallow

Plant species	Proportion by weight
Intermediate or late perennial ryegrass	66 %
Red clover	15 %
Common vetch	10 %
Birdsfoot trefoil	7 %
Common or black knapweed	2 %

## O2. Change cultivation and tillage practices

### O2.1. Cultivate and till across slope

#### Objectives

Cultivating and drilling land along the slope (contour) reduces the risk of developing surface runoff. In turn this discourages soil erosion and loss of associated particulate phosphorus in surface runoff to receiving watercourses. The measure is moderately effective in reducing particulate phosphorus. The measure is moderately effective in reducing particulate phosphorus.

The work covered by this measure involves cultivating and tilling across the slope on cultivated soils.

#### Specifications

- Only appropriate on gently or moderately sloping fields where fields shape allows and land has a simple slope pattern.
- Make sure your equipment can operate properly and that it is safe to work across the slope.

#### Related measures

- N.A.

#### Exclusions

- N.A.

## O3. Protect soils over winter

### O3.1. Winter cover crops

#### Objectives

Cover crops reduce the risk of potential pollutants, such as sediment and nutrients including phosphorus, being carried to neighbouring watercourses. They may also help to reduce nitrate leaching on land that would normally be left bare or down to stubbles during winter. The measure is moderately effective in reducing particulate phosphorus.



Down slope ploughing can encourage surface water runoff. Photograph courtesy of Evenlode Catchment Partnership.

The work covered by this measure involves establishing a cover crop immediately post-harvest.

#### Specifications

Use this measure on whole or part parcel rotational land where cultivated land draining directly to a watercourse is at risk of soil erosion or surface runoff.

#### Requirements:

- Establish a quick-growing cover crop by 15 September that will provide a dense cover and protect the land from soil erosion and runoff, ideally drill following the combine.
- Destroy the cover crop in late January or early February, a maximum of 6 weeks before establishing the following spring crop. When weather conditions delay establishment of a spring crop, the cover crop can be left until mid-March.
- Do not apply any fertilisers or manures.

#### Choice of cover crop:

- A mix or a single crop can be used, but crops should be suitable for winter sowing, fast growing (to mop up N) and frost tolerant to provide adequate cover over winter.
- A mixture of seeds, such as rye, vetch, phacelia, barley or mustard, can be sown, or other crops such as ryegrass or tillage radish, but the choice of cover crop will depend on herbicide selected and the rates of application for the previous crop.
- Choice of cover crop will also depend on the crops grown in the rotation.

#### How to manage the crop:

- Remove any areas of soil compaction but do not subsoil on archaeological features.
- Establish the cover crop by 15th September, so it can take up soil nitrate before winter drainage water leaches it below the depth of the developing plant.



Cover crop growing in the Evenlode catchment. Photograph courtesy of Cotswold Seeds.



- Establish by drilling or broadcasting.
- Sow at a suitable seed rate to provide a dense cover and protect from soil erosion.
- Destroy the cover crop in late January or February, before it is too well developed – if left too late nitrate leaching may increase the following winter.
- Cover crop destruction may include an application of glyphosate prior to destruction by cultivation for the following crop.

#### Related measures

- On fields next to a watercourse that are at risk of soil erosion and runoff buffer strips should also be considered. They will help to capture any sediment / phosphorus carried in runoff water. See measures O4.1 (6m+ buffer strip), O4.2 (12m+ watercourse buffer strip) and O4.3 (in-field grass strip).

#### Exclusions

- N.A.

## O4. Using vegetation (buffer strips) to intercept water, sediment and nutrients

### O4.1. 6m+ buffer strip

#### Objectives

Next to a watercourse a vegetated and unfertilised grass strip can act as a natural buffer feature to reduce the transfer of sediment and nutrients from agricultural land to water. It works in two ways. Firstly, it intercepts surface runoff from agricultural land, acting as a sediment trap and filter for nutrients. Secondly, it distances agricultural activity from watercourses, reducing direct pollution from fertilisers sprays and organic manure additions. It can also restrict direct livestock access to the watercourse, reducing bankside erosion and direct urination and defecation into the water. The measure is moderately effective in reducing particulate phosphorus.

Depending on management of the grass strip, it may also provide new habitat and protect existing landscape features. The work covered by this measure involves establishing and managing a grass buffer with no scrub developing.

#### Specifications

The following bullets set out the key principles of establishing and managing a grass buffer with no scrub developing. However, specialist advice should be sought on the location, the size of land and site-specific management options. Your Agricultural Advisor can provide advice free of charge.

#### Location:

- The measure can be used on land next to watercourses or next to trackways that channel runoff water directly to a watercourse.

#### Requirements:

- Establish a grass buffer strip at least 5 metres wide.
- Manage the buffer strips to control woody growth and make sure there is no more than 5 % bare ground.
- Control scrub and undesirable plant species so that there is no more than 5 % covering the banks of the water body by year 2.
- Remove all cut material.
- Do not apply any fertilisers or manure.
- Do not graze.
- Do not use pesticides, except for herbicides to spot-treat or weed-wipe for the control of injurious weeds or invasive non-natives, nettles or bracken.
- Do not use the buffer strip as an access route for vehicles or stock.

#### Related measures

- The measure can be combined with C7.3 (Livestock trough and associated pipework), C7.4 (Hard base for livestock drinkers), C7.5 Pasture pump and associated pipework), C7.6 (Solar panel pumps and associated pipework), C7.7 (Pipework), C.5.1 (Gate), C5.2 (Gateway Relocation), C5.3 (Resurfacing gateways), C7.1 (Post and wire) and C7.2 (Sheep Netting).

#### Exclusions

- Land should not be overlapping a public right of way (such as a footpath and bridleway).



Images showing buffer strips from the air in a central location of the River Evenlode. Photographs courtesy of RSK Orbital.

## O4.2. 12m+ watercourse buffer strip

### Objectives

- See objectives for measure O4.1 (6m+ buffer strip).
- This measure (12m+ watercourse buffer strip) describes buffer strips with a width of 12m or more.

### Specifications

- See specification for measure O4.1 (6m+ buffer strip).

### Related measures

- See specification for measure O4.1 (6m+ buffer strip).

### Exclusions

- See specification for measure O4.1 (6m+ buffer strip).

## O4.3. In-field grass strip

### Objectives

Grass strips located on land prone to soil erosion will help to reduce particulate phosphorus and sediment losses by slowing down surface runoff and intercepting sediment delivery. The measure is moderately effective in reducing particulate phosphorus. It can also reduce losses of nitrate and pesticides. As the land will be relatively unmanaged, the measure can also provide ecological benefits such as year-round habitat and food for a range of wildlife. The work covered by this measure involves establishing and managing a grass strip with no scrub developing.

### Specifications

The following bullets set out the key principles in establishing a grass strip with no scrub developing. However, specialist advice should be sought on the location, the size of land and site-specific management options. Your Agricultural Advisor can put you in contact with an agronomist who will work with you free of charge to prepare a management plan.

#### Location:

- As a guide, land identified on the Farm Environment Record (FER) as a risk of soil erosion or surface runoff, is likely to be a suitable location.
- Manage the buffer strips to control woody growth and make sure there is no more than 5 % bare ground.
- Remove all cut material.
- Applicable on both arable land and grassland, although the latter will require fencing and installation of gates to keep livestock away from the grass strips.
- On natural drainage pathways, such as the bottom of a valley, to stop runoff water from creating rills and gullies.

- On long, sloping fields, with the strip placed parallel to the slope and alternated with the wide, cultivated strips, to slow runoff water and trap sediment and organic material.

#### Requirements:

- Do not apply any fertilisers or manure.
- Do not plough.
- Do not graze.
- Do not use pesticides, except for herbicides to spot-treat or weed-wipe for the control of injurious weeds or invasive non-natives, nettles or bracken.
- Do not use the land as an access route for vehicles or stock.

### Related measures

- On grassland with livestock the measure can be combined with C5.1 (Gate), C5.2 (Gateway Relocation), C5.3 (Resurfacing gateways), C7.1 (Post and wire fencing) and C7.2 (Sheep netting fencing).

### Exclusions

- The measure should only be used on areas of land identified as prone to runoff. Your agricultural advisor can help you identify suitable areas.
- Land should not be overlapping a public right of way (such as a footpath and bridleway).
- Where there is a need to implement this measure on more than 30 % of the parcel, applicants should consider instead using measure O1.1 (arable reversion to grassland, or other lower P agricultural practice) to cover a larger area.

## O4.4. Take small areas out of management

### Objectives

Taking small areas out of management such as field corners, particularly on flow routes, can capture sediment, particulate phosphorus and other pollutants transported in surface runoff (e.g. nitrate and pesticides). The measure is moderately effective in reducing particulate phosphorus.

As the land will be unmanaged, the measure can also provide ecological benefits such as year-round habitat and food for a range of wildlife.

The work covered by this measure involves taking a small area of land (e.g. on the edge or corner of a field) out of production.

### Specifications

The following bullets set out the key principles for taking a small area out of production. However, specialist advice should be sought on the location, the size of land and site-specific management options. Your Agricultural Advisor can help you identify suitable areas free of charge.

#### Location:

- As a guidance, land identified on the Farm Environment Record (FER) as at risk of soil erosion or surface runoff, is likely to be suitable locations.
- Applicable on both arable land and grassland, although the latter will require fencing and installation of gates to keep livestock away from the grass strips.

#### Requirements:

- Do not apply any fertilisers or manure.
- Do not plough.
- Do not graze.
- Do not use pesticides, except for herbicides to spot-treat or weed-wipe for the control of injurious weeds or invasive non-natives, nettles or bracken.
- Do not use the land as an access route for vehicles or stock.

#### Related measures

- If the area is adjacent to livestock fields, the measure can be combined with C5.1 (Gate), C5.2 (Gateway Relocation), C7.1 (Post and wire fencing) and C7.2 (Sheep netting fencing).

#### Exclusions

- The measure should only be used on land identified as prone to runoff. Your agricultural advisor can help you identify suitable areas.
- Land should not be overlapping a public right of way (such as a footpath and bridleway).
- Where there is a need to implement this measure on more than 30 % of the parcel, applicants should consider instead using measure O1.1 (arable reversion to grassland, or other lower P agricultural practice) to cover a larger area.



Field corner measures can be used to target flow pathways and soil loss at locations such as on the left above. Wooded field corners offer one solution (above right). Photograph courtesy of Evenlode Catchment Partnership

## O5. Water features to intercept water, sediment and nutrients

### O5.1. Management of wetlands, swales, ponds and scrapes

#### Objectives

Wetlands and swales are highly effective at trapping phosphorus. However, to sustain this effectiveness they need to be regularly inspected and properly maintained.

The work covered by this measure comprises routine inspection and maintenance of wetlands (and swales).

#### Specifications

Your Agricultural Advisor can provide you with more detailed information on managing your wetlands and swales. The following bullets set out key principles.

- A maintenance access way should be identified as part of the planning and design process.
- Vegetation growth should be inspected regularly; monthly at the start and then as required.
- After a large storm, the hydraulic function of the wetland or swale should be checked for evidence of physical damage, blockage to inflows and outflows and silt accumulation.
- Ideally, sediment will be removed from the forebay of a wetland on an annual basis.
- Sediment from the main wetland area or swale can be removed as required every 2-5 years, by removing one quadrant at a time.
- When pool volume is reduced by 20 % or more, a more extensive sediment removal effort should be undertaken.
- Vegetation management may include removal of 25 % of bank vegetation from water edge to say 0.5m above water level.
- Hand cutting submerged and aquatic plants across a maximum of 25 % of the total area in any given year.
- Specific management will be required if any invasive species are present. Further advice on this can be obtained from your agricultural advisor.
- Note maintenance activities may be defined in the flood risk activity permit for the wetland. Disposal of waste material may require a Waste Environmental Permit (see section 5).

#### Related measures

- Related measures are creation of wetlands (C6.1), creation of swales (C6.2), 12m+ buffer strips (O4.2), in-field grass strips (O4.3) and 'take small areas out of management' (O4.4).

#### Exclusions

- Be aware of exclusions set out in creation of wetlands (C6.1).



## 4. Specification for capital measures

This section provides the technical specifications for capital measures on a farm. The Evenlode Catchment Fund will provide one-off payments to implement these measures.

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### C1. Change the way P is applied

#### C1.1. Farm nutrient management plan with a focus on phosphorus

##### Objective

Phosphorus behaves very differently to nitrogen. It binds with soil and only dissolves slowly in water over time. Although it doesn't readily leach into groundwater, phosphorus can still pollute watercourses via:

- Erosion.
- Farm runoff.

During soil erosion, valuable soil and nutrients including phosphorus are lost from a farm and they often end up in watercourses. During wet periods, when you can see dirty runoff going into watercourses, it is likely to contain soil particles and phosphorus.

The work covered by this measure comprises a) collecting information and data about how nutrients (particularly phosphorus) are used, stored and processed on your farm, then b) analysing and interpreting that information to determine if there are ways these nutrients can be managed more efficiently. This process allows you to check if your farm has a surplus of nutrients. Changing how you use nutrients may reduce a surplus - improving farm profitability as well as reducing the amount of phosphorus and other nutrients lost to watercourses.

The effectiveness of this measure at reducing the amount of phosphorus reaching watercourses will depend on how nutrients are currently being managed on a farm. However, most nutrient management plans will identify some surpluses in nutrients on a farm – and hence have the potential to be a moderate or highly effective tool at reducing loss of phosphorus to natural waters.

##### Specification

As part of this measure, we would require you to include a farm nutrient management plan as part of your overall application. This should be carried out in accordance with an industry standard methodology (e.g. 'Tried and Tested Nutrient Management Plan', <http://adlib.everysite.co.uk/adlib/defra/content.aspx?id=253499>).

We will contribute towards the cost of soil analysis (P, K, Mg, pH and organic matter). We can also offer a specialist free of charge to support you in this exercise.

##### Related measures

- N.A.

##### Exclusions

- N.A.

### C2. Improve soil structure and organic matter

#### C2.1. Cultivate compacted tillage soils

##### Objective

Compacted tillage soils increase the risk of surface run off and soil erosion. Cultivation of these compacted tillage soils increases soil aeration and water infiltration rates, which can help to reduce the risk of surface runoff and soil erosion and therefore the pollution of watercourses by sediment and associated pollutants. This helps to limit the amount of phosphorus reaching watercourses, with a moderate level of effectiveness.

The work covered by this measure comprises the cultivation of compacted soils.

##### Specification

This measure is applicable to all tillage land where soils are compacted, and particularly on sloping land.

- The type of machinery required depends on the soil type, texture and the depth of compaction, but is likely to include shallow spiking or sub-soiling. Expert advice should be sought on the appropriate machinery.
- To maximise the benefit and avoid any further soil compaction, only use machinery when the soil is dry at the depth that is to be loosened. It is possible that this process may cause initial damage to the root system for grassland fields.

##### Associated measures

- N.A.

##### Exclusions

- N.A.

### C3. Improve management of manure in animal housing and yards (clean and dirty water management)

#### Introduction

Dirty water is water contaminated by manure (and often other sources of pollution associated with farm yards). Clean water is uncontaminated rain water. Minimising the volume of dirty water produced on a farm and keeping clean and dirty water separate reduces the risk of dirty water contaminating watercourses.

Clean and dirty water is kept separate by taking the clean rain water from roofs via gutters, down pipes and pipework straight to soakaways, ditches and streams. The rain water that falls on to outdoor yards is deemed dirty and is sent via a separate drainage system to a storage tank or slurry system. It is subsequently disposed of as a nutrient onto land.

The measure can be highly effective in reducing loss of phosphorus to watercourses, if the source of dirty water is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The work covered by this measure involve implementing practical measures on and around farmyards to separate and store dirty water (C3.1, outdoor concrete yard renewal; C3.2, underground drainage pipework; C3.3, inspection pit / chamber; C3.4, rainwater goods and C3.5, below ground storage tank). Because the Catchment Fund is sponsored by a Water Company, the works also include measures to store clean rain water as an alternative to using the public water supply (C3.6, above ground storage tank and C3.7, first flush rainwater diverters and filters).

#### C3.1. Outdoor concrete yard renewal

##### Objectives

Renewing or improving an outside yard to create a smooth surface graded to facilitate effective drainage will reduce the amount of dirty water generated on the yard (e.g. less will be needed to clean it). It will also allow dirty water to be effectively drained.

This measure can be highly effective in reducing loss of phosphorus to watercourses if the yard is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The works covered by this measure comprise a) improving existing outdoor (uncovered) concrete yards or b) upgrading existing hardcore, tarmac or earth yards to a concrete outdoor (uncovered) yard.

##### Specifications

- Any renewed yards should be constructed using a minimum of 150 mm thick concrete on at least 150 mm thickness of compacted and blinded hardcore.

- The use of a polythene membrane on the surface of newly laid concrete will assist in curing the concrete and prevent premature drying-out.
- It is recommended that the slab is reinforced to minimise cracking and distribute the loads exerted by livestock and/or farm vehicles.
- The concrete should be laid in bays and all joints treated with an appropriate sealant that is resistant to effluent attack.
- The work must satisfy the relevant British Standards or other relevant or equivalent standards including BS 8000, BS 8500, BS EN 206-1, BS EN 1992 and BS 6213, all of which deal with concrete works and sealants.
- Do not fully load concrete until it achieves its design strength (equivalent to 28 day strength).
- All drainage works must comply with the provisions of BS 8000, BS EN 752 and BS EN 1610.
- Great care should be taken to ensure that open excavations are not left unguarded during the works.

#### Related measures

The yard works will only be effective at managing dirty water if effluent is directed safely (and without leakage) to a storage tank ready for disposal. See measures C3.2 (underground drainage pipework), C3.3 (inspection pit / chamber), C3.5 (below ground storage tank).

Minimising the volume of rainfall falling on the yard reduces the volume of dirty water that needs to be managed. See measures C3.4 (rainwater goods), C3.6 (above ground storage tank) and C3.7 (first flush rainwater diverters and filters).

#### Exclusions

- Indoor yards or any form of covered yard work are not eligible.
- You must not roof over an outdoor concrete yard following improvement, even at your own expense. This will place you in breach of your agreement and you may be required to repay the grant received.



Clean concrete yard. Photograph courtesy of Natural England.

### C3.2. Underground drainage pipework: yard works for clean and dirty water separation

#### Objectives

Dirty water generated by a yard needs to be effectively conveyed from source to a storage tank without leakage to ground or surcharge to the surface. This is the function of the underground drainage infrastructure covered by this measure.

This measure can be highly effective in reducing loss of phosphorus to watercourses if the area drained by the pipework is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The works covered by this measure comprise underground drainage pipework (includes all excavation, bedding, pipes, fittings and backfill). The work may extend to re-organisation of clean and dirty drains.

#### Specifications

- All drainage works must comply with the provisions of BS 8000, BS EN 752 and BS EN 1610.
- Clean water must not be contaminated by foul/ dirty water.
- Any foul/dirty-water (which includes slurry or manure residues) and any channels and pipes used in connection with such storage must conform to the Water Resources (control of pollution) (silage, slurry, and agricultural fuel oil) (England) regulations 2010 and as amended 2013 (SSAFO) and have a minimum design life of 20 years (with maintenance).
- If silage effluent is involved, below ground storage systems must be 'maintenance free' for the 20 year design life. The use of materials such as UPVC or glass-reinforced plastic (GRP) will normally meet this requirement.
- Great care should be taken to ensure that open excavations are not left unguarded during the works.

#### Related measures

The drainage system will only be effective at managing dirty water if effluent is effectively collected on the surface and directed safely towards the drainage system (C3.1, outdoor concrete yard renewal). Inspection pits / chambers may also be required to ensure the safe and effective maintenance of the drainage system (C3.3, inspection pit / chamber). Adequate storage will be required for the collected effluent (C3.5, below ground storage tank).

Minimising the volume of rainfall falling on the area contributing to the drainage system (e.g. a yard) reduces the volume of dirty water that needs to be managed. See measures C3.4 (rainwater goods), C3.6 (above ground storage tank) and C3.7 (first flush rainwater diverters and filters).

It may be appropriate to consider use of cross drains or cross humps (C5.5, cross drains / cross humps) in directing dirty water toward the drainage network.

#### Exclusions

- N.A.

### C3.3. Inspection pit/chamber

#### Objectives

Inspection pits / chambers are required to ensure the safe and effective maintenance of dirty water drainage system (C3.2, underground drainage pipework).

This measure can be highly effective in reducing loss of phosphorus to watercourses if the area drained via the inspection pit/ chamber is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse. The works covered by this measure comprise provision of an access point for underground drainage pipework.

#### Specifications

- See general specification set out in C3.2 (underground drainage pipework).
- For concrete manholes and inspection chambers see BS EN 1917:2002.

#### Related measures

- See related measures set out in C3.2 (underground drainage pipework).

#### Exclusions

- N.A.

### C3.4. Rainwater goods (e.g. downpipes and gutters)

#### Objectives

Rainwater goods is the collective term for items that collect and convey clean rainwater. They are used to capture and convey rainwater away from areas where dirty water is generated (e.g. cattle yards), preventing the mixing of clean with dirty water and thus reducing the volume of dirty water that needs to be managed on a farm.

Collecting clean water also generates free clean water that can be used around the yard, as an alternative to using the public water supply.

This measure can be highly effective in reducing loss of phosphorus to watercourses if it prevents the mixing of clean and dirty water in working areas adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The works covered by this measure comprise provision of rainwater goods for existing buildings within the farmyard that currently do not have rainwater goods or which have existing rainwater goods which are beyond their serviceable life and need replacement.

## Specifications

Throughout the work, every effort should be made to ensure that foul or dirty water does not contaminate the clean water collected. Clean water from new rainwater goods must be directed into a clean water drain.

## Related measures

Related measures comprise C3.1 (outdoor concrete yard renewal), C3.2 (underground drainage pipework), C3.3 (inspection pit / chamber), C3.5 (below ground storage tank), C3.6 (above ground storage tank) and C3.7 (first flush rainwater diverters and filters).

## Exclusions

- Rainwater goods on proposed new buildings are not eligible for a grant as they should already have rainwater goods built into the design.
- This item can't be used for collecting dirty water, effluents and slurries.

## C3.5. Below ground storage tank

### Objectives

Below ground storage tanks are required to store dirty water collected via a drainage system (C3.2, underground drainage pipework) in a way that is safe to people and the environment.

This measure can be highly effective in reducing loss of phosphorus to watercourses if the area draining to the storage tank is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The works covered by this measure comprise provision of a below ground storage tank to collect water conveyed via underground drainage pipework.

### Specifications

Typical underground storage tanks are made from glass-reinforced plastic (GRP) and pre-cast concrete. They may also be built in situ (poured concrete using shuttering/ steel reinforcement) or potentially, for small tanks, using bricks or blocks and rendered to make waterproof. However, in situ concrete tanks and masonry tanks can be very expensive and they must be designed and constructed by competent persons.

- GRP tanks should conform to BS EN 13923 or other relevant or equivalent British Standards.
- Installation should follow the manufacturer's instructions.
- The work includes the tank, pump, site excavation, a lean-mix concrete bed, backfilling with concrete to cover the tank and then, optionally, a free-flowing material to ground level and installation of connecting pipework and pump.
- Pre-cast concrete tanks should conform to BS 8000, BS EN 1917, BS EN 1992-3:2006 or other relevant or equivalent standards.

## Related measures

This measure is likely to be used in conjunction with the following: C3.1 (outdoor concrete yard renewal), C3.2 (underground drainage pipework) and C3.3 (inspection pit / chamber).

Minimising the volume of rainfall falling on the area contributing to water stored in the tank reduces the volume of dirty water that needs to be managed. See measures C3.4 (rainwater goods), C3.6 (above ground storage tank) and C3.7 (first flush rainwater diverters and filters).

## Exclusions

Tanks may not be suitable in ground with a high water table unless further structural work is undertaken to avoid tanks from floating. In such cases you must seek advice from the manufacturer.

## C3.6. Above ground storage tank

### Objectives

Above ground storage tanks can be used to store rainwater from roofs and buildings. This water can be used around the farm as an alternative to drawing on the public water supply.

Although this measure is associated with the separation of clean and dirty water, the principal reason for including it as a measure under the Thames Catchment Fund is that it encourages re-use of water (a practice strongly encouraged by Water Companies such as Thames Water). Its individual impact on management of phosphorus on a farm is likely to be low.

The work covered by this measure comprises installing an above ground storage tank.

### Specifications

New above-ground storage tanks should be suitably located on hardstanding or concrete according to the manufacturer's instructions. There are no generic specifications for above-ground storage tanks as they are pre-made tanks supplied as fit for purpose.

## Related measures

Fitting a first flush rainwater diverter and filter (C3.7) is critical to achieve good quality water. Related measures associated with separation of clean from dirty water comprise C3.1 (outdoor concrete yard renewal), C3.2 (underground drainage pipework), C3.3 (inspection pit / chamber), C3.4 (rainwater goods) and C3.5 (below ground storage tank).

## Exclusions

- Second-hand tanks are not eligible for grant aid as they are unlikely to have the longevity required.
- This measure does not include a lined, soil-bunded 'pond' for rainwater collection.



### C3.7. First flush rainwater diverters and filters

#### Objectives

These items divert and filter potentially contaminated roof water to keep leaves, debris and other contaminants out of water storage tanks. Contaminated water is diverted away from tanks, reducing tank maintenance and protecting pumps.

Although these items are associated with the separation of clean and dirty water, the principal reason for their inclusion as a measure under the Thames Catchment Fund is that they encourage re-use of water (a practice strongly encouraged by Water Companies such as Thames Water). Their individual impact on management of phosphorus on a farm is likely to be low.

The work covered by this measure includes the supply and installation of first flush diverters and filters.

#### Specifications

- Install in accordance with manufacturer's recommendations.
- Diverted contaminated water must not enter a clean water drain or discharge to ditches or watercourses.

#### Related measures

- This measure will commonly be implemented with C3.6 (above ground water tank) and C3.4 (rainwater goods) as part of a rainwater harvesting system.

#### Exclusions

- This measure is only available in conjunction with a rainwater harvesting system.

## C4. Improve how manure (and silage) is stored

### C4.1. Dedicated manure (and silage) storage facilities

#### Objectives

Provision of dedicated storage facilities for manure (or silage) prevents direct loss of phosphorus in runoff from stores to soils and watercourses. In the case of manure stores it also allows greater flexibility in the timing of mucking out buildings and manure spreading. Thus, improving storage and handling of manure in vulnerable locations can significantly reduce the amount of phosphorus reaching watercourses.

Optimising the timing of manure spreading has other benefits. Spreading can be undertaken when a) soils can best accommodate traffic and b) nutrients are most likely to be taken up by the crop/grass.

This measure provides support for the design and construction of new or improved storage and handling facilities for farm yard manure (or silage). Examples of such measures are an impermeable base on which to store manure / silage and / or a collection systems to capture leachate draining from the store.

#### Specifications

Specialist advice should be sought when designing new or improved storage and handling facilities for farm yard manure and silage. Your Agricultural Advisor can put you in contact with an agricultural engineer who will work with you free of charge to prepare a design.

#### Related measures

- N.A.

#### Exclusions

- This measure is only appropriate to farms that over-winter livestock in yards, and have limited suitable locations for storage of manure or silage.
- Because the scope and scale of a storage facility needed on individual farms will be very different, a unit rate for this measure has not been set in Table 2.1. Instead, funding from the Catchment Fund will be decided on a case by case basis, in accordance with the assessment criteria set out in the terms of conditions.



Dirty yard



Clean yard and manure store.

Photographs courtesy of Natural England

## C5. Reduce runoff from tracks and gateways

### C5.1. Gate

#### Objectives

Gates help with stock management, or help to stop livestock from accessing areas from which they need to be excluded. Greater control over the management and movement of livestock can help to reduce runoff and the pollution of watercourses by sediment, faecal contaminants and associated pollutants. This helps to limit the amount of phosphorus reaching watercourses, but only with a low level of effectiveness.

The work covered by this measure comprises the installation of a new gate.

#### Specifications

The gate should be constructed in a style which is traditional to the local area in timber or steel, and should be soundly framed and constructed. It should comply with the following requirements:

- Components used to construct the gate should be of an adequate dimension for the design, size and intended use for each kind of material.
- Steel gates must be hot dipped galvanised after manufacture or painted with two coats of suitable non-toxic paint. Cold galvanising is classed as a painted finish.
- All gates must have a minimum height of 1.1 metres from the bottom of the bottom rail to the top of the top rail.
- The width should be adequate for the intended agricultural purpose and not less than three metres where access is required for firefighting purposes.
- Openings greater than 4.5 metres must have two gates.
- Gates must be complete with all the fittings needed for their efficient operation.
- Gates should be securely hung on hinges, affixed to the gate post, so that they can swing freely to the fully open position without coming in contact with the ground and easily closed with a securing latch or bolt.

#### Related measures

- This measure provides greater detail on the specification of the gate for related measure C5.2 gateway relocation.

#### Exclusions

- This measure cannot be used to replace an existing gate.

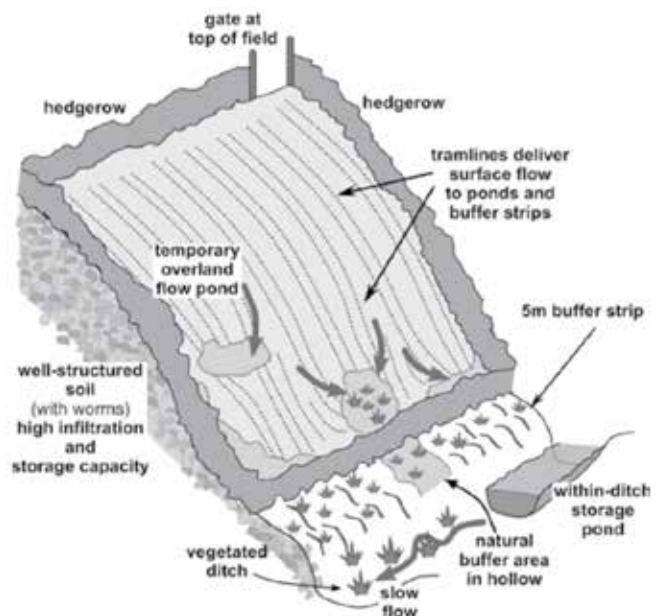
### C5.2. Gateway relocation

#### Objectives

Relocation of gates allows existing gates, which can be areas of increased activity, soil compaction and poaching, to be moved away from areas with a high risk of runoff, such as the bottom of a slope or near a watercourse, to a

more appropriate lower risk position, such as the top of the slope or away from the watercourse. This helps in reducing runoff pathways and limits the amount of phosphorus reaching watercourses, but generally only with a low level of effectiveness.

The work covered by this measure comprises the installation of a new gate; the gapping up of the boundary at the location of the original gate; and any works required to associated trackways.



Potential for integrated runoff control to reduce flood risk, pollution and erosion. Diagram courtesy of CIRIA FRMRC.

#### Specifications

This measure is applicable to all farming systems with gateways in high risk areas, and is relatively simple to implement.

##### Gate:

- New hanging and shutting posts should be used.
- Further specifications on gates are in measure C5.1 above.

##### Gapping up:

- The materials used to gap up the old gateway should match the character of the rest of the boundary.
- These materials, plus the actual method used to make good the gap (and potential additional cost), should be agreed with your Agricultural Advisor.
- Where appropriate the original gateposts should be left in situ.

##### Other:

- Where appropriate, trackways associated with the removal of the original gate should be re-routed and the disused sections made good.

### Related measures

- This measure is related to measure C5.1 (installation of gates).
- This measure may be combined with C5.3 (resurfacing of gateways).

### Exclusions

- N.A.

## C5.3. Resurfacing gateways

### Objectives

Gates can be areas of intense activity, soil compaction and poaching. Resurfacing reduces runoff and hence the pollution of watercourses by sediment, faecal contaminants and associated pollutants. This helps to limit the amount of phosphorus reaching watercourses, but generally only with a low level of effectiveness.

The work covered by this measure comprises the resurfacing of ground near a new or existing gateway.

### Specifications

The resurfaced area should be large enough to ensure that all poaching / rutting generated by traffic through the gate is eliminated. As a minimum, this is likely to require resurfacing of an area defined as follows: full width of the gateway multiplied by the length of the gate into the field (opened at 90 degrees).

Appropriate works will involve:

- Excavate the extent of the hardstanding to a minimum depth of 150 mm or down to a naturally occurring sub-base, the depth of which will vary with the type of ground.
- Remove the excavated soil from the immediate gateway area, spread it on the verges of the field track and profile as necessary to permit drainage.
- Overlay the excavation with a geotextile membrane and apply aggregate/hardcore to a minimum consolidated depth of 150 mm. The required depth of hardcore depends upon soil type; the depth of existing ruts can be used as a guide. A greater depth of stone will be required on peaty soils. In such circumstances a coarser aggregate will be needed to form a base/ sub-base layer before placing hardcore on the surface. In most situations, the minimum depth should be at least 150mm.
- The whole of the hardcore area should be well compacted. If there is a requirement for a thicker depth of hardcore, successive layers (each 150 mm thick) should be applied and be well compacted.

### Related measures

- This measure is related to measure C5.1 (installation of gates).

- This measure may be combined with C5.2 (relocation of gateways).

### Exclusions

- N.A.

## C5.4. Livestock and machinery hardcore track

### Objectives

Effective positioning, construction and maintenance of new livestock/farm machinery tracks can help to reduce the amount of poaching, soil erosion, run-off and watercourse pollution associated with farm traffic. All of these are associated with increased phosphate runoff.

This measure can be highly effective in reducing loss of phosphorus to watercourses if the section of track is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The work covered by this measure comprises the laying of hardcore tracks to facilitate the movement of livestock and machinery.

### Specifications

Where possible, tracks should be sited remote from watercourses. A suitable buffer should be maintained between the track and watercourse.

Drainage off tracks must be managed to avoid pollution of watercourses (see related measures).

#### Hardcore Tracks:

- Excavate a trench 2.4 m wide and to a minimum depth of 150 mm, or down to a depth where a firm base is reached.
- Use the soil to profile the edge of the track so that it acts as bunding and prevents the movement of track materials.
- Overlay the excavation with a geotextile membrane and backfill with local stone or coarse scalpings to a depth of 150 mm or more and until compact. The exact depth of local stone/hardcore will depend upon the frequency of livestock / machine movements. Not all soil types require a geotextile membrane, its main function is to separate underlying soil from the overlying hardcore<sup>1</sup>.
- Top off the track with a finer material (wearing course, 18 mm to dust) to a depth of 25 - 50 mm and compact it into a camber with a vibrating roller so as to ensure track drainage.
- Any track run-off should be directed to a ditch or other stable drainage outlet or diverted onto grassland.

<sup>1</sup> Refer to CSF Capital Grant Scheme Farmer Handbook for further advice on track construction on different soil types (<http://publications.naturalengland.org.uk/publication/314101>)

Hardcore tracks using concrete sleepers:

- Excavate a trench following the instructions above and in addition:
  - Invert the concrete sleepers and lay them slightly proud of the ground.
  - Lay the sleepers directly on to a level, firm surface and butt them up against each other to form a track (a geotextile membrane is not required).

#### Related measures

- The installation of cross drains or cross humps (measure C5.5) is essential on sloping tracks where careful management of run-off from the track is required to ensure dirty water does not run direct to ditches or watercourses. Swales (C6.2) may be needed to effectively manage dirty water.
- To avoid disturbance of ditches and to reduce sedimentation and bacterial levels in natural water, culverts can be installed to allow farm machinery or livestock to cross watercourses (C5.6, installation of piped culvert in ditches).

#### Exclusions

- N.A.

### C5.5. Cross drains and cross humps

#### Objectives

Cross drains (or humps) will intercept and convey surface runoff off farm tracks and yards. They will reduce channelling of surface runoff and hence the risk of sediment and other pollution entering a watercourse.

This measure can be highly effective in reducing loss of phosphorus to watercourses if the track or yard is adjacent to a watercourse, or on a direct hydrological pathway to a watercourse.

The works covered by this measure comprise construction of a single cross drain or hump with a length equal to the width of a single carriageway track.

#### Specifications

##### General

- Position the cross drain / hump so it catches the water on the uphill side of the track or yard and transfers it to an outfall where it will not cause new erosion or runoff issues.
- Spacing is critical and you should discuss your proposals with your Agricultural Advisor.
- Redirect water from the cross drain to a stable drainage outlet such as a ditch or drain intended specifically to convey dirty water or a swale. Low flows can be directed to pasture, field margin or buffer.
- Construct the drain either by digging a partially covered channel to collect sediment and redirect surface water, or

by constructing a low hump to direct surface flows (see details below).

- Maintain drains and drainage outfalls or the areas around humps by removing built-up sediment or other clogging materials.

For open channel (cross drain):

- Excavate a channel across the width of the track or in a yard to a depth of at least 100mm and 100mm to 250mm wide, for ease of clearing.
- Line the channel with concrete and install a gridded top that must be at least 150mm wide

For cross hump:

- Excavate a foundation trench across the track or yard to a depth of at least 300mm.
- fill it with concrete.
- key in kerbstones across the trench so they protrude 60 to 100mm above the surrounding surface.
- It may be appropriate to construct the channel in concrete with a gridded top which must be at least 150mm wide.

#### Related measures

- Swales (C6.2, O5.1) or wetland (C6.1, O5.1) may be needed to effectively manage dirty water.

#### Exclusions

- Do not direct any runoff towards any biodiversity, historic or archaeological features.
- Do not allow polluted water from drains to reach a watercourse or pond.

### C5.6. Installation of piped culvert in ditches

#### Objectives

This watercourse crossing will provide access for farm machinery or livestock. It will reduce the disturbance to the watercourse which will help reduce sedimentation and bacterial levels in the water. This helps to limit the amount of phosphorus reaching watercourses, but only with a low level of effectiveness.

The work covered by this measure comprises installation of a single culvert. The culvert should be constructed in such a way that it does not create a backwater during normal flows, passes the design flow and facilitates the safe crossing of machinery and / or livestock.

#### Specification

- Install a concrete pipe at least 450mm in diameter following the manufacturer's instructions.
- Ensure that pipes have a positive joint to preserve alignment.
- Make sure that the pipe lengths give a useable width.



at ground level that is appropriate for the traffic using the crossing:

- Minimum width of 4m for wheeled traffic.
- Less than 4m acceptable for livestock footpaths and bridleways.
- Set the pipes on a firm bed and in true alignment.
- Make sure that the pipe gradient approximates to that of the ditch bed.
- Make sure that the pipe invert (the level of the inside bottom of the pipe) at the upstream end is well below the bottom of the true ditch bed.
- Grade the ditch bed downstream if any deepening is needed to accommodate the culvert.
- Maintain the culvert for the duration of the agreement, removing debris that builds up so as to maintain flow.
- Where the above standard specifications for the culvert are not suitable for the weight of machinery using the crossing, applicants must obtain advice from a suitably qualified civil engineer and complete the works in accordance with their advice - applicants are responsible for ensuring the culvert does not collapse.
- Ensure that all work:
  - Meets relevant British Standards, that is, culverts must be constructed using concrete pipes that comply with BS 5911 and BS EN 1916, pipework must be laid in accordance with BS 8000 - examine copies of the most up-to-date standards for guidance.
  - Complies with the culvert design and operation guide (C689).

### Related measures

- C5.4 (livestock and machinery hardcore track).

### Exclusions

- Note that modern environmental legislation presumes against culverts as watercourse crossings in favour of open span structures that retain the natural bed and banks of a watercourse and allow light to penetrate beneath the structure. Proposals to install culverts will be challenged on a 'main river' under the Environmental Permitting (flood risk) process; they may be challenged on 'other watercourses' (see section 5, Permissions, approvals and consents).

## C6. Water features to intercept water, sediment and nutrients

### C6.1. Creation of wetlands

#### Objectives

Wetlands can be highly effective at phosphorus removal. By slowing the movement of water through them, they help settle out sediment and the particulate phosphorus

attached to it. Plants in a wetland may also take up nutrients, stabilise sediments and help further slow the flow of water.

A major advantage of purpose build wetlands of the type commonly constructed on farms is that they can be designed to provide more than one benefit, including habitat and some flood control provision if appropriately designed.

The work covered by this measure comprises design and construction of wetland features with a primary function to remove phosphorus from runoff.

### Specifications

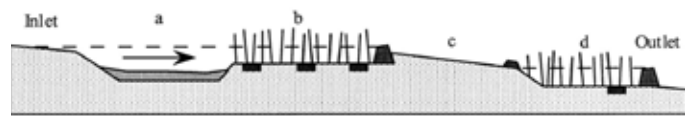


Figure 4.1: On-farm wetland indicative design. Diagram reproduced from Braskerud (2002)

Specialist advice should be sought on locating and designing wetlands. Your Agricultural Advisor can put you in contact with an environmental specialist who will work with you free of charge to prepare a design. The following bullets set out key principles.

- Measures to reduce the sources of pollution should be put in place first before considering use of constructed wetlands.
- The size of the wetland will depend on soil type, runoff volumes to be intercepted and desired removal efficiency. Generally, the larger the basin, the greater the removal efficiency. A specialist should be consulted to calculate likely runoff volumes from the catchment to size the wetland and allow sufficient headroom for several intense rainfall events.



A complex constructed wetland in the central Evenlode catchment. Photograph courtesy of Cotswold Seeds.

- Wetlands should be wedge-shaped in plan so that flow enters the pond and spreads out to improve sedimentation.
- Ponds should be developed to mimic natural forms using soft geometries and undulating margins rather than hard edges.
- All wetlands require a sediment forebay or other form of upstream pre-treatment system (e.g. a swale). Sediment can be managed more effectively in a smaller area.
- Gentle slopes (no more than 1:4) ensure that the edges provide valuable wildlife habitat and act as a safety feature.
- The wetland will include zones of both very shallow (<20cm) and moderately shallow (<50 cm) water, as well as deeper areas, using underwater earth berms to create the zones. Maximum depth of permanent pools should not exceed 2m to avoid stratification and anoxic conditions.
- Inlets and outlets should be 200-300mm below mean water level to minimise disturbance and re-suspension of particles in the pond and should be located in the deepest point to provide final settling.
- If the wetland is to be constructed in a source protection zone for groundwater a liner will be required to ensure there is no discharge to ground. Artificial liners are also likely to be required on soils with less than a 20 % clay content.
- Vegetated inlets can trap silts and pollutants, as well as reducing nutrient input.
- Face overflow outlet channels with stone to prevent erosion.
- Create outlets larger than inlets if using pipes to prevent water backing up along the system.
- Ideally, the wetland must consist of more than one feature to maximise its effectiveness. For example, Figure 4.1 shows two features in series to allow settling and polishing. This design will provide a longer flow path to encourage settling, and it provides two depth zones to encourage plant diversity.
- The area can be left to colonise naturally with plants or planted using species of local provenance. However, vegetated wetlands are typically more effective at phosphorus removal than non-vegetated ones and due regard should be given to including some form of planting within the design. Avoid aggressive species such as Greater reed mace (*Typha latifolia*).
- Areas around the wetland can also be seeded using a species rich grass and flower mix appropriate to soil conditions and the region. Selective and careful use of other vegetation around the basins can help enhance or conceal features as desired and stabilise slopes, reducing erosion.

### Related measures

- A wetland may need to be periodically maintained, to manage sediment build up and vegetation growth, by mowing and desilting (O5.1, management of wetlands, swales, ponds and scrapes).
- Wetlands require a sediment forebay or other form of upstream pre-treatment system. This can often take the form of a swale (C6.2, Swale).

### Exclusions

- Because the type and scale of wetlands will vary depending on location, a unit rate for this measure has not been set in Table 2.1. Instead funding from the Catchment Fund will be decided on a case by case basis, in accordance with the assessment criteria set out in the terms of conditions.
- Note that several permissions are likely to be required prior to implementation of this measure (see section 5, Permissions, approvals and consents). Early consultation with regulating authorities is advisable.
- Wetlands cannot be constructed in locations where their backwater increases flood risk to property or another person's land, unless the property or land owner is made aware of the risk and gives their consent.

## C6.2. Creation of swales

### Objectives

A swale is a broad vegetation lined channel or shallow blind channel planted with vegetation to direct and convey runoff, reduce flow velocity and uptake nutrients, including phosphorus. The collected 'clean' water is discharged to a watercourse or stored to infiltrate into the ground.

Swales may be used on their own for very lightly contaminated runoff or as part of an integrated wetland system, for instance running alongside a track and discharging into a sediment pond. Alone they have limited effectiveness at removing phosphorus. As part of a well-designed integrated wetland system, they can be highly effective at removing phosphorus from runoff.

The works covered by this measure comprise the design and construction of a stand-alone swale.

### Specifications

Advice should be sought on locating and designing swales. Your Agricultural Advisor and the Evenlode Catchment Partnership can put you in contact with an environmental specialist who will work with you free of charge to prepare a design. The following bullets set out key principles.

- Swales are unsuitable for high strength effluents (e.g. dairy runoff, septic tank runoff) unless the swale is fully lined and the effluent is being conveyed to additional treatment stages.
- A swale will typically not be suitable for gradients steeper than 2 degrees.

- Water should preferably be directed laterally into a swale rather than as a single point inflow.
- The swale outlet will be a pipe or underdrain system to the point of discharge, or can also be left un-piped with a check dam acting as the outflow.
- The shape of a swale should be trapezoidal or parabolic in cross-section as these are easy to construct and maintain.
- Swale side slopes should be no greater than 1 in 4.
- The normal maximum dry swale depth is 400-600mm, with a 150-200mm freeboard over the design depth.
- A width ranging between 0.6-3.0 m. The wider the swale the more opportunities there are for edge habitat for wildlife. Additional edge benefit will be gained by maximising the length of the swale using curved sections, rather than straight lines.
- Check dams within the swale can enhance the performance of swales, maximize the retention time, decrease flow velocities and promote sedimentation. Standing water can also benefit species such as water beetles, dragonflies and snails. Check dams can be simple wood structures (such as willow hurdles) or more substantial (for example made of stone). Research has indicated that permeable barriers function most effectively.
- Swales should be planted with native plants taking care not to seriously impede storm water passage.
- The drier areas around and on the top of the banks of the swale can be seeded with a native wildflower mix that can help treat sheet flow entering the swale and will provide seeds for birds and mammals and a nectar source for insects.

### Related measures

- A swale may need to be periodically maintained, to manage sediment build up and vegetation growth, by mowing and desilting (O5.1 management of wetlands and swales).
- Swales are often integrated with other wetland and runoff management features e.g. O4.2 (12m+ watercourse buffer strips) and C6.1 (creation of wetlands)

### Exclusions

- Note that several permissions may be required prior to implementation of this measure (see section 5, Permissions, approvals and consents). Early consultation with regulating authorities is advisable.
- Swales cannot be constructed in locations where their backwater increases flood risk to property or another person's land, unless the property or land owner is made aware of the risk and gives their consent.

## C6.3 Creation of ponds and scrapes

### Objectives

Ponds can slow the movement of water and settle out sediment and particulate phosphorus. Plants in a wetland may also take up nutrients, stabilise sediments and help further slow the flow of water. They can also be designed to provide more than one benefit, including habitat and some flood control provision.



A constructed pond in the Evenlode catchment. Photograph courtesy of Evenlode Catchment Partnership and Cotswold Seeds.

Advice should be sought on locating and designing your pond. Many of the principles you can use to design your pond are similar to those for wetlands (see specification set out in C6.1 wetlands). Indeed, a more complex feature such as the C6.1. Wetland measure could consist of a series of ponds linked by swales (C6.2).

Your Agricultural Advisor can put you in contact with an environmental specialist who will work with you free of charge to prepare a design. They will help point you in the direction of some of the great guidance available to design ponds and scrapes. For example, the Evenlode Catchment partnership are currently developing a standard design for a pond in the Evenlode Catchment that can be used for sediment and particulate phosphorus trapping, biodiversity enhancement and flood water storage.

### Related measures

- A pond may need to be periodically maintained, to manage sediment build up and vegetation growth, by mowing and desilting (O5.1, management of wetland, swales, ponds and scrapes).
- Ponds require a sediment forebay or other form of upstream pre-treatment system. This can often take the form of a swale (C6.2, Swale).
- A series of ponds can be linked by swales (C6.2, Swale) to design a more complex wetland measure (C6.1. Wetland)

### Exclusions

- Because the type and scale of ponds will vary depending on location, a unit rate for this measure has not been set in Table 2.1. Instead funding from the Catchment Fund

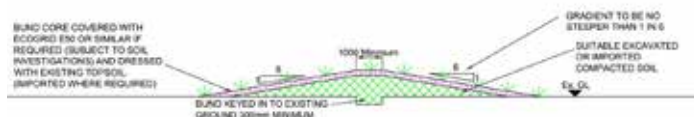
will be decided on a case by case basis, in accordance with the assessment criteria set out in the terms of conditions.

- Note that several permissions are likely to be required prior to implementation of this measure (see section 5, Permissions, approvals and consents). Early consultation with regulating authorities is advisable.
- Ponds cannot be constructed in locations where their backwater increases flood risk to property or another person's land, unless the property or land owner is made aware of the risk and gives their consent.

## C6.4 Creation of bunds

An earth embankment or bund may provide an effective way of slowing water, built into the local topography to store water behind it. Wetlands, swales, ponds or scrapes may also need to be incorporated into the design to store surface water run-off from the land.

Advice should be sought on locating and designing your bund to ensure breaching will not occur and there is no risk of overtopping. Your Agricultural Advisor can put you in contact with an environmental specialist who will work with you free of charge to prepare a design. They will help you make the most of local resources to create your bund. The Evenlode Catchment partnership are also developing a standard design for a bund in the Evenlode Catchment that you can adjust and use on your farm. A sample bund is shown in the diagram below.



Typical bund section.

Diagram courtesy of Evenlode Catchment Partnership

### Related measures

- A bund might be used as a component in the creation of a wetland (C6.1. Wetland), swale (C6.2. Swale) or pond (C6.3. Pond or scrape).

### Exclusions

- Note that several permissions are likely to be required prior to implementation of this measure (see section 5, Permissions, approvals and consents). Early consultation with regulating authorities is advisable.
- Bunds cannot be constructed in locations where their backwater increases flood risk to property or another person's land, unless the property or land owner is made aware of the risk and gives their consent.
- This item is not relevant on historic or archaeological features or areas of wildlife value as identified on the Farm Environment Record (FER), the Environmental Information Map or the HEFER.

## C7. Keep stock away from watercourses

### C7.1. Post and wire fencing

#### Objectives

Trampling by livestock can erode banks and increase inputs of sediment to watercourses lowering surrounding water quality. Livestock can also add pollutants directly by urinating and defecating into the water. Preventing access by fencing off watercourses and/or buffer strips is a simple solution to help reduce this type of pollution, with a moderate level of effectiveness.

The work covered by this measure comprises fencing off watercourses and/or buffer strips to prevent or reduce livestock access using post and wire fencing.

#### Specifications

The following bullets set out the key principles for installing post and wire fencing. However, specialist advice should be sought on exact siting and choice of fencing. Your Agricultural Advisor can provide advice free of charge.

Location:

The siting and choice of fencing should consider:

- The need to permit farm operations.
- The risk of flooding and the accumulation of debris on the fence, as this can result in increased flood risk and possible damage to fence.
- The risk of river channel movement and subsequent loss of fence to the river.
- The desirability of maintaining restricted grazing of riparian areas to encourage habitat diversity and flora and fauna dependent on vegetation management and light poaching.

Requirements:

- All types of fencing must comply with BS1722 specifications. Wire should conform to BS4102 or BS EN 10223.
- There is no minimum or maximum distance that the fence needs to be from the watercourse (including ponds, rivers, streams and ditches that contain water that livestock use for drinking water). However, try to locate the fence on stable ground away from the immediate bank edge as this may be vulnerable to erosion.
- There may be circumstances where some grazing is desirable. This can be done by fencing away from the bank so that livestock can be allowed occasional access within the fenced area. However, if faecal contamination is a concern then livestock should be kept away from the watercourse entirely. In this case fencing, should be far enough away from the top of the bank to enable occasional mechanical control of vegetation.



### Related measures

- To increase the effectiveness of the measure in reducing phosphorus it can be combined with O4.1 (6m+ buffer strip) and O4.2 (12m+ watercourse buffer strip).
- The measure can also be combined with C7.3 (Livestock trough and associated pipework), C7.4 (Hard base for livestock drinkers), C7.5 (Pasture pump and associated pipework), C7.6 (Solar panel pumps and associated pipework), and C7.7 (Pipework).

### Exclusions

- N.A.

## C7.2. Sheep netting fencing

### Objectives

Trampling by livestock can erode banks and increase inputs of sediment to watercourses lowering surrounding water quality. Livestock can also add pollutants directly by urinating and defecating into the water. Preventing access by fencing off watercourses and/or buffer strips is a simple solution to help reduce this type of pollution, but only with a low level of effectiveness.

The work covered by this measure involves fencing off watercourses and/or buffer strips to prevent or reduce livestock access using sheep netting fencing.

### Specifications

- See general fencing specification under measure C7.1 (post and wire fencing).

### Related measures

- See related measures under measure C7.1 (post and wire fencing).

### Exclusions

- See exclusions under measure C7.1 (post and wire fencing).



Fencing to prevent livestock entering the river. Photograph courtesy of Atkins.

## C7.3. Livestock trough and associated pipework

### Objectives

A water trough provides livestock with an alternative to drinking from watercourses. Used in combination with fencing it keeps livestock watered but away from watercourses. This reduces bank erosion and pollution by sediment, faecal contaminants and associated pollutants. The amount of phosphorus reaching watercourses is reduced, but only with a low level of effectiveness.

A trough combined with a level hard standing also prevents soil damage, promotes stock welfare and prevents disease transmission.

The work covered by this measure comprises purchase and installation of a new livestock trough, as well as pipework near the trough.

### Specifications

Livestock trough:

- Make sure the trough meets the relevant British Standard (BS3445).
- Make sure the trough is made of galvanised steel, or concrete, spray-moulded glass-reinforced cement (GRC), or polyethylene.
- Connect the trough to a water supply or supply water from a bowser on a regular basis.
- Make sure the trough has a ball valve and service box.
- Meet the Water Supply (Water Fittings) Regulations 1999 if using a mains water supply.

Pipework:

- See relevant sections of measure C7.7.

### Related measures

- This measure is primarily intended to provide an alternative source of drinking water when watercourses are fenced off (measures C7.1 and C7.2).
- The trough must be sited on a level area of hardstanding, to prevent poaching. See measure C7.4 (hard but permeable base for livestock troughs).
- Long lengths of pipe to connect the trough to a water supply may be funded through measure C7.7 (drinking water pipework).
- Water may need to be pumped to the trough. See measure C7.6 (solar panel pump).

### Exclusions

- The trough should not be located near watercourses, on areas vulnerable to soil erosion.

## C7.4. Hard but permeable base for livestock troughs

### Objectives

Placing livestock troughs on hard bases will help to reduce soil poaching by cattle in these areas, which are areas of high livestock activity. This can therefore reduce soil erosion and runoff and the pollution of watercourses by sediment, faecal contaminants and associated pollutants. This helps to limit the amount of phosphorus reaching watercourses, but only with a low level of effectiveness. The potential to reduce poaching will be greatest on medium/heavy soil.

The work covered by this measure comprises the associated groundwork, construction of a hard surface and the re-siting of livestock troughs. If it is necessary to move an existing trough, there will be a need to install new pipe work.

### Specification

The hard base should meet the following specification:

- The soil should be excavated to a minimum depth of 150mm or down to a naturally occurring hard surface.
- The excavated area around the livestock trough should extend to a minimum width of 2.5m.
- Prior to placing the hardcore a geotextile membrane should be laid over the excavated area.
- The hardcore should then be well compacted by rolling to a minimum depth of 150mm.
- If there is a requirement for a deeper thickness of hardcore, each successive layer should not exceed 150mm thickness and should be well compacted.
- The finished hardcore area should be blinded with at least 50mm of a suitable blinding material.
- Timber boards will provide an edge to the hard base to help retain the hardcore.
- The livestock trough can then be relocated to the hardstanding.

### Related measures

- This measure is likely to be combined with a combination of the following related measures: C7.3 (livestock trough and associated pipework); C7.5 (pasture pump and associated pipework); C7.6 (solar panel pumps and associated pipework); and, C7.7 (drinking water pipework).

### Exclusions

- N.A.

## C7.5. Pasture pump and associated pipework

### Objectives

A low-lift, animal-operated pasture pump provides livestock with an alternative to drinking from watercourses. Used in combination with fencing the pump keeps cattle

watered but away from watercourses. This reduces bank erosion and pollution by sediment, faecal contaminants and associated pollutants. The amount of phosphorus reaching watercourses is reduced, but only with a low level of effectiveness.

The work covered by this measure comprises purchase and installation of a pasture pump, and pipework near the pump. It also covers the construction of a hardstanding to reduce poaching of ground.

A pasture pump will provide water for approximately 20 cattle.

### Specifications

Pasture pump:

- The water source and pump must be adequate to supply water troughs for the use of livestock.
- Equipment must be serviceable, of a standard fit for agricultural use and comply with any relevant British Standard.
- The pump should be secured to robust and preserved timber.

Hard standing:

- The hardstanding should consist of a minimum area around the pasture pump of 1 m x 1 m and excavated to a minimum depth of 150 mm or down to a naturally occurring hard surface.
- Hardcore should be well compacted on a geotextile liner by rolling to a minimum depth of 150 mm.
- The hardstanding area should be edged with preserved timber (not smaller than 150 mm x 50 mm) to prevent the movement of hardcore.

Pipework:

- See relevant sections of measure C7.7.

### Related measures

- This measure is intended to provide an alternative source of drinking water when watercourses are fenced off (measures C7.1 and C7.2).
- Long lengths of pipe to connect the pump to a water supply may be funded through measure C7.7 (drinking water pipework).

### Exclusions

- Pasture pumps may not be suitable for livestock that drink large volumes of water such as dairy or suckler cows and also not suitable for sheep.

## C7.6. Solar panel pump

### Objectives

One alternative for delivering water to a drinking trough is a solar powered pump. In combination with fencing the pump and trough keep cattle watered but away from watercourses. This reduces bank erosion and pollution of watercourses by sediment, faecal contaminants and associated pollutants. The amount of phosphorus reaching watercourses is reduced, but only with a low level of effectiveness.

This measure comprises just the solar panel pump and pipework near the pump.

### Specifications

Solar panel pump:

- The water source and pump must be adequate to supply water troughs for the use of livestock.
- Equipment must be serviceable, of a standard fit for agricultural use and comply with relevant British Standards.

Pipework:

- See relevant sections of measure C7.7.

### Related measures

- This measure is intended to provide an alternative source of drinking water when watercourses are fenced off (measures C7.1 and C7.2).
- This measure may be combined with C7.3 (livestock trough and associated pipework) and C7.4 (hard but permeable base for livestock drinkers).
- Long lengths of pipe to connect the pump to a water supply may be funded through measure C7.7 (drinking water pipework).

### Exclusions

- The water trough and hardstanding supplied by the pump must conform to the specification set out in C7.3 (livestock trough and associated pipework) and C7.4 (hard but permeable base for livestock trough).

## C7.7. Drinking water pipework

### Objectives

This measure provides for installation of pipework to supply livestock drinking troughs or pumps. It is intended to fund long lengths of pipe to connect a pump or trough to a water supply.

In combination with fencing and other measures (details below) pipework reduces bank erosion and pollution of watercourses by sediment, faecal contaminants and associated pollutants. This combination of measures limits the amount of phosphorus reaching watercourses, but only with a low level of effectiveness.

### Specifications

Pipework:

- Pipework and fittings for the supply of drinking water to livestock must conform to the appropriate parts of BS 12201.
- Pipework must be medium-density blue polyethylene (with a minimum external diameter of 25 mm).
- All joints must be watertight.
- Pipework must be buried below cultivation depth and to a minimum depth of 600 mm or as determined by your local water supplier.
- When crossing open ditches, pipework must be covered by a tubular steel guard or sleeve pipe and laid 600 mm below the ditch to allow for ditch cleaning.
- When crossing farm tracks, the pipe must be laid on a 75 mm bed of sand and then covered by further 100 mm of sand before being overlaid by backfill.
- The installation must meet the Water Supply (Water Fittings) Regulations 1999 if using a mains water supply.

### Related measures

- This measure is intended to support the installation of livestock drinking troughs (C7.3) or pumps (C7.5, C7.6). Any alternative use will need to demonstrate a clear benefit to management of diffuse pollution.

### Exclusions

- N.A.

## C8. In channel measures to slow flow

### C8.1. Small leaky wood dam

#### Objectives

Leaky wood dams will slow the movement of water and help push flows onto the floodplain during floods. Some of the sediment carried in the floodplain flow will settle out on the floodplain. Particulate phosphorus attached to the settled sediment will be removed from the watercourse, but only with a low level of effectiveness.

Leaky wood dams will also increase temporary storage of flood waters within watercourses and out on to the floodplain, help delay the passage of flood water downstream and reduce downstream flood risk.

This measure describes leaky wood dams in channels between 1m and 2.99m wide.



## Specifications

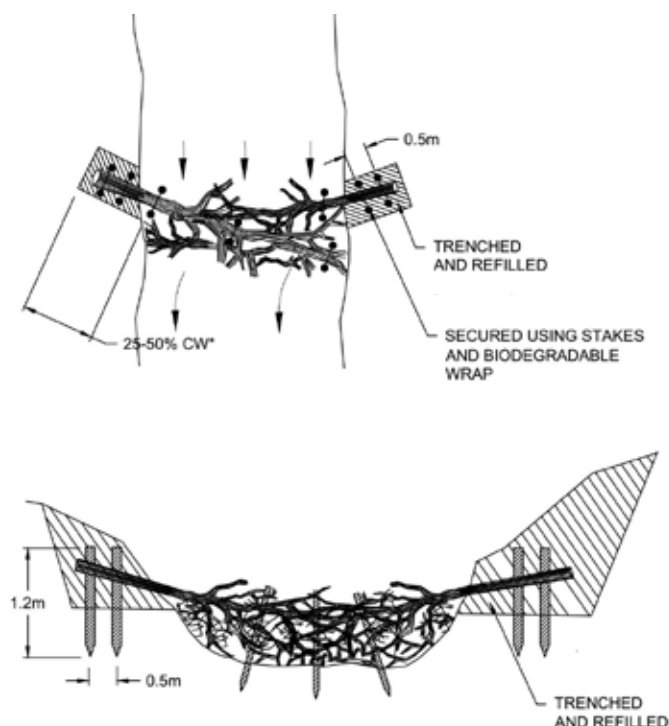


Figure 4.2: Small leaky wood dam indicative design

Specialist advice should be sought on the location and design of dams. Your Agricultural Advisor and the Evenlode Catchment Partnership can put you in contact with an environmental specialist who will work with you free of charge to prepare a design. The following bullets set out key principles:

- The dams must be a stable and long lasting structure. They will be built of lengths of felled timber (nominally >300mm in diameter), at least 1 ½ times as long as the channel is wide. These timbers should be set perpendicular to flow and of sufficient size to ensure regular spill of water onto the floodplain during floods. The dams should be sufficiently porous to allow low flows to pass unimpeded.
- Timbers must be secured in agreement with the authority issuing the 'environmental permit for flood risk activities' that consents the installation of the dam. Normal practice is to trench or drive timbers into the bank and / or use stakes and ties.
- Build dams in series (minimum 3 dams) at a spacing between dams of about 5-7 times the width of the channel.
- Make sure dams are not installed directly upstream of pinch points such as bridges or culverts (avoids blockage in the extremely unlikely event a dam fails).
- Check and maintain dams to keep the structure effective.

## Related measures

- N.A.

## Exclusions

- Note that several permissions are likely to be required prior to implementation of this measure (see section 5, Permissions, approvals and consents). Early consultation with regulating authorities is advisable.
- Leaky dams cannot be constructed in locations where their backwater increases flood risk to property or another person's land, unless the property or land owner is made aware of the risk and gives their consent.



Small woody feature on a watercourse in the Stroud NFM pilot area, Gloucestershire. Photograph courtesy of Atkins

## C8.2. Large leaky woody dam

### Objectives

See objectives for measure C9.1 (small leaky wood dam). This measure (large leak woody dam) describes leaky wood dams in channels between 3m and 5m wide.

### Specifications

- See specification for measure C9.1 (small leaky wood dam); noting that the timber used to construct larger dams should be more substantial i.e. of a nominal diameter of > 500 mm.

### Related measures

- N.A.

### Exclusions

- See exclusions for C9.1 (small leaky wood dam).





Large woody feature on a watercourse in the Stroud NFM pilot area, Gloucestershire. Photograph courtesy of Atkins

### C8.3. Check dam

#### Objectives

Check dams are small dams constructed across a swale to slow flows, allowing run-off to pool behind the dam and encouraging sediment deposition and water infiltration. Swales are often used along-side roads where the road surface can drain directly to the swale. They can be used to treat lightly contaminated run-off from hard standing around farmyards and farm roads where it pools before soaking away. Particulate phosphorus attached to the settled sediment will be removed from the run-off, but only with a low level of effectiveness.

The work covered by this measure comprises the construction of check dams within a swale.

#### Specifications

- Check dams should be located at regular intervals along a swale, though the steeper the gradient of the swale the shorter the distance between them should be.
- They can be made from graded broken stone or timber.
- Excavate a trench across the width of the swale.
- Make the trench 200 mm deep and 3.3m long.
- Build up the check dam to 75 – 150 mm and grade broken stone/timber to a height of 500 mm above the floor of the swale.
- The side slopes of the check dam should be at a maximum gradient of about 1 in 2.

#### Related measures

- Check dams are often used as water retention features in swales C8.2 (swale).

#### Exclusions

- N.A.



Check dam in a central part of the Evenlode catchment. Photograph courtesy of Evenlode Catchment Partnership.

## 5. Permissions, approvals or consents

It may be necessary to secure permissions, approvals or consents from regulatory authorities (hereafter referred to collectively as ‘consents’) prior to implementation measures promoted by the fund.

We advise that you check with relevant authorities about which consents are required as soon as possible. Our agricultural advisor is available to provide high level support, but responsibility for determining and securing the necessary consents lies with you.

The table and bullets below set out the consents most likely required for each of the measures promoted by the Catchment Fund.

- **Planning Permission** – Advice on when planning permission is needed for a farm, when it is not and permitted development is, available at <https://www.gov.uk/planning-permissions-for-farms/when-you-dont-need-it>
- **Flood risk** – English law distinguishes between ‘main river’ and ordinary watercourses<sup>2</sup>.
  - **Main river** – You must follow the environmental permitting rules if you want to do work on or near a main river, on or near a flood defence structure, or in a flood plain (or on or near a sea defence). Further advice is available at <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> and in the ‘Living on the Edge’ guidance document at <https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities>
  - **Ordinary watercourses** – Contact your local authority to determine whether your works require Land Drainage Consent.
- **Discharges to surface water and groundwater** – You may need an environmental permit if you discharge liquid effluent or waste water (poisonous, noxious or polluting matter, waste matter, or trade or sewage effluent). Further advice is available at <https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits>
- **Waste** – A project that uses or recycles waste may need an environmental permit for waste. Advice available at <https://www.gov.uk/guidance/waste-environmental-permits>
- **Landscape** – Visual impacts on landscape character should also be considered, particularly in designated landscapes (e.g. Cotswold AONB), Conservation Areas and historic parkland.
- **Historic Environment** – Avoid sites of archaeological or historic importance such as scheduled monuments, listed buildings, registered battlefields or registered parks and gardens. Consider need for relevant consents (e.g. Scheduled Monument consent managed by Historic England).
- **Natural Environment** – Consider the impact on protected sites and species. Advice is available at <https://www.gov.uk/guidance/construction-near-protected-areas-and-wildlife>

<sup>2</sup> A map showing ‘main river’ is available at <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683&y=355134&scale=5&layerGroups=default&ep=map&textonly=off&lang=e&topic=mainrivers>; Ordinary watercourses are defined as every river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows, but which does not form part of a main river.

Operational measure code	Capital measure code	Measures	Planning Permission	Environmental Permitting			Landscape	Historic Environment	Natural Environment
				Flood risk <sup>3</sup>	Water Quality	Waste			
01	Reversion to different vegetation								
01.1		Arable reversion to grassland (or other lower P agricultural practice)							
01.2		Two year sown legume fallow							
	C1	Change the way P is applied							
	C1.1	Farm nutrient management plan with a focus on P							
02	Change cultivation and tillage practices								
02.1		Cultivate and till across slope							
	C2	Improve soil structure and organic matter							
	C2.1	Cultivate compacted tillage soils							
03	Protect soils over winter								
03.1		Winter cover crops							
	C3	Improve management of manure in animal housing and yards (clean and dirty water separation)							
	C3.1	Outdoor concrete yard renewal	x		x		x	x	
	C3.2	Underground drainage pipework			x				
	C3.3	Inspection pit / chamber			x		x	x	
	C3.4	Rainwater goods	x					x	
	C3.5	Below ground storage tank	x		x				
	C3.6	Above ground storage tank	x		x		x	x	
	C3.7	Flush rainwater diverters and filters							
	C4	Improve how manure (and silage) is stored							
	C4.1	Dedicated manure storage facilities	x	x	x	x	x	x	x
	C5	Reduce runoff from tracks and gateways							
	C5.1	Gate						x	
	C5.2	Gateway relocation						x	
	C5.3	Resurfacing gateways						x	
	C5.4	Livestock and machinery hardcore track	x	x	x	x	x	x	x
	C5.5	Cross drains / cross humps			x				
	C5.6	Installation of piped culvert in ditches		x				x	
04	Using vegetation (buffer strips) to intercept water, sediment and nutrients								
04.1		6m+ buffer strip							
04.2		12m+ watercourse buffer strip							
04.3		In-field grass strip							
04.4		Take small areas out of management							

<sup>3</sup> Flood risk permission is required where works are within the floodplain or impact on an ordinary watercourse – see Floodplain (Flood Zone 2 and 3) map <https://flood-map-for-planning.service.gov.uk>

Table B.1: A guide to consents that may be required to support measures promoted by the Catchment Fund

Operational measure code	Capital measure code	Measures	Planning Permission	Environmental Permitting			Landscape	Historic Environment	Natural Environment
				Flood risk <sup>3</sup>	Water Quality	Waste			
<b>05</b>	<b>C6</b>	Water features to intercept water, sediment and nutrients							
	C6.1	Creation of wetlands	x	x	x		x	x	x
	C6.2	Creation of swales		x	x			x	x
	C6.3	Creation of ponds and scrapes	x	x	x		x	x	x
	C6.4	Creation of bunds	x	x	x		x	x	x
05.1		Management of wetlands, ponds swales and scrapes				x			
	<b>C7</b>	Keep stock away from watercourses							
	C7.1	Post and wire		x					
	C7.2	Sheep netting		x					
	C7.3	Livestock trough and associated pipework					x	x	
	C7.4	Hard but permeable base for livestock trough					x	x	
	C7.5	Pasture pump and associated pipework					x	x	
	C7.6	Solar panel pumps					x	x	
	C7.7	Drinking water pipework							
	<b>C8</b>	In channel measures to slow flow							
	C8.1	Small leaky woody dam		x					
	C8.2	Large leaky woody dam		x					
	C8.3	Check dams		x					
		Farmer Innovation							
			?	?	?	?	?	?	?



# **Appendix A - Terms and Conditions**



# Thames Water Smarter Water Catchments Evenlode Catchment Fund

## Terms and Conditions

### Introduction

The Catchment Fund has been set up by Thames Water to reduce the amount of phosphorus lost from fields and farmyards to watercourses.

The Catchment Fund provides grants to support improvements to farms and farming operations that reduce the loss of phosphorus to watercourses. It is voluntary and not all applications for participation will be successful.

### Terms and Conditions

Application to and participation in The Catchment Fund is governed by these Terms and Conditions and any person who applies for a grant under The Catchment Fund is deemed to have read and accepted these Terms and Conditions.

#### **1. The Catchment Fund**

##### **1.1. What does The Catchment Fund cover?**

- 1.1.1. The Catchment Fund provides grants that support improvements to a) farm infrastructure (capital measures) and b) farm operations measures that reduce the loss of phosphorus to watercourses. Measures being promoted by The Catchment Fund are presented in the Smarter Water Catchments Evenlode Catchment Fund Handbook, which can be accessed at [www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments](http://www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments); the Handbook includes a summary table of measures and more detailed specifications for each measure. Funding for works that reduce loss of phosphorus to watercourses but are not listed in the Handbook may be still be supported by the Catchment Fund by making a special case as a 'Farmer Innovation'. A measure or group of measures implemented under the Catchment Fund is referred to in these Terms and Conditions as a 'Project'.
- 1.1.2.
- 1.1.3. The Catchment Fund will not support works that are a legislative requirement or industry obligation and will only support good agricultural practice. Funding to cover maintenance, replacement due to normal wear and tear or existing / partially implemented works is not covered.

##### **1.2. How much grant is available?**

- 1.2.1. There is no minimum grant; the maximum available in this application period is £20,000 (exc VAT). A farm business can only apply once in any application period (as set out in the application form), but this single application may include funding for multiple measures.
- 1.2.2. Schedule B sets out rates to be used to calculate how much The Catchment Fund will contribute to the implementation of a Project on a farm.

##### **1.3. What are the eligibility criteria?**

- 1.3.1. To be eligible to participate in The Catchment Fund and apply for a grant:

- the part of the farm in which the Project is proposed must be located within the Evenlode catchment (the area shown in Schedule A - the “Relevant Site”);
- you must be an owner and/or tenant farmer in the Relevant Site, authorised with all the appropriate consents to participate in the Project;
- you must complete and sign an application form in accordance with section 2 below;
- you must provide copies of the supporting information, as specified on the application form;
- you must be willing to allow or facilitate monitoring of soils and water on your land to help us assess the effectiveness of the trial. This information will not be shared with organisations external to the project without your permission;
- you must be aged eighteen years or over on the date your application form is submitted.

1.3.2. These criteria may be updated or changed from time to time.

## **1.4. Which applications are more likely to be funded?**

1.4.1. Applications that meet the technical requirements listed below are more likely to be funded if:

- The proposed Project comprises measures that:
  - are effective at reducing loss of phosphorus from fields and farmyards to watercourses (Schedule B identifies measures considered to be most effective);
  - are located on substantial hydrological pathways to watercourses;
  - have been identified in cooperation and consultation with The Catchment Fund’s Agricultural Advisor; and
  - can be monitored to determine their effectiveness.
- The applicant demonstrates engagement with the principles of The Catchment Fund and is promoting practices that directly or indirectly reduce loss of phosphorus from fields and farmyard to watercourses.

1.4.2. However, we are unable to guarantee that your application for a grant will be successful. We may decline an application if it fails to meet the eligibility criteria and/ or if we are unable to provide funding, regardless as to whether or not the application meets the eligibility criteria or addresses the technical requirements. An inability to provide funding may arise if we receive a lot of applications in an application period.

## **1.5. Can I apply to other organisations for a grant?**

1.5.1. Nothing in these Terms and Conditions prevents you from applying to other organisations for a grant. However, if another organisation provides you with a grant (or any other form of financial assistance) for the same Project (or any item of it) as set out in your application form (whether this is before or after the date of any acceptance of your application), you will not be eligible to receive a grant from us under The Catchment Fund unless there are exceptional circumstances (see clause 1.5.3).

1.5.2. If your application has been successful under The Catchment Fund, you should not apply to another organisation for a grant for the same Project (or any item of it), unless there are exceptional circumstances (see clause 1.5.3), as this could invalidate your grant under The Catchment Fund. If your application has not been successful under The Catchment Fund, you may apply to another organisation for a grant.

1.5.3. In exceptional circumstances, we may agree to co-fund a project with another organisation where there is clear benefit to do so for all parties. In such circumstances, we may amend/reduce the rates set out in Schedule B. If you wish us to consider co-funding a project with another organisation this must be clearly indicated in your application along with a statement explaining why you think this should be accepted.

## **2. Applications to The Catchment Fund**

### **2.1. Who can apply?**

- 2.1.1. You are welcome to apply for a grant if your application meets the eligibility criteria set out in section 1.3. An application is more likely to be successful if the project it proposes meets the technical criteria set out in section 1.4. Note that planning permissions or other consents may be required to implement a project on your farm. This is your responsibility not Thames Water's. Please consult with relevant authorities to seek advice before submitting your application.

## **2.2. How do I apply?**

- 2.2.1. If you would like to apply to participate in The Catchment Fund, you must complete and sign the application form before the close of the application period and provide all information requested in the form. The form can be accessed at [www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments](http://www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments). The form must be submitted to us in accordance with the instructions in the form.
- 2.2.2. We may request from you further information reasonably required to support your application. We will be unable to assess your application until you have provided all information requested.

## **2.3. Who can help me with my application?**

- 2.3.1. We encourage you to prepare your application in consultation with your local Agricultural Advisor. Our advisor is familiar with The Catchment Fund and can work with you to identify measures appropriate to your farm and most likely to meet the technical requirements of The Catchment Fund. Although our advisor will provide support, you will be responsible for the content and submission of your application.
- 2.3.2. Contact details for your local Agricultural Advisor are as follows:
- Name: Sarah Olney
  - Tel: 07920 757516
  - Email: [Sarah.Olney@naturalengland.org.uk](mailto:Sarah.Olney@naturalengland.org.uk)

## **2.4. How many applications can I make?**

- 2.4.1. You are entitled to make one application for your farm per application period as set out on the Application Form, subject to these Terms and Conditions. If you have multiple farm businesses, your Agricultural Advisor will determine if they are separate farm businesses that may, at Thames Water's absolute discretion, allow you to make further applications – one per farm business – during one application period.

## **2.5. How do I know if I have been successful or not?**

- 2.5.1. Once you have completed and submitted The Catchment Fund application form we will notify you in writing if your application has been successful. If we notify you that your application has been successful, then a contract will be formed between you and us on the basis of your application form and these Terms and Conditions and in accordance with any information or conditions set out in such notification.
- 2.5.2. If you have any queries on your application or if you have any concerns about our decision regarding your application, please email your local Agricultural Advisor, Sarah Olney at [Sarah.Olney@naturalengland.org.uk](mailto:Sarah.Olney@naturalengland.org.uk)

## **3. Your project**

### **3.1. When can I commence my Project?**

- 3.1.1. You should only commence your Project once you have received written confirmation from

us that your application has been successful and that you should commence works. If you choose to start work associated with a Project prior to such confirmation from us, you run the risk of not being entitled to a grant payment.

- 3.1.2. Please note that once your application for your Project has been accepted by us, you cannot change your Project (or any part of it) without our prior written consent to such changes. If for any reason you need to change any part of your Project, you must notify us in writing of the proposed change and the reasons therefore and await our written consent before implementing such changes. A failure to obtain our consent to such changes could invalidate your grant.

### **3.2. Do I need to do anything else before I commence my Project?**

- 3.2.1. You should check with relevant authorities (e.g. Local Planning Authority, Environment Agency or Natural England) to determine if any permissions, approvals or consents are required before your Project is implemented. Prior to the commencement of your Project, it is your responsibility to consider the need for, and where appropriate, put in place and/or comply with:
- all necessary permissions (including planning permissions), consents, licences and authorisations to undertake the Project and any associated works at your farm;
  - guidance from the Environment Agency and Natural England for the implementation of your Project and any associated works, where applicable; and
  - any further permissions, approvals and consents as reasonably requested by us, unless otherwise agreed by your local Agricultural Advisor.

### **3.3. Implementing your Project**

- 3.3.1. Once you have obtained all required permissions, consents, licences and authorisations in accordance with section 3.1 and section 3.2 above, you will need to implement your Project as set out in your application form and in accordance with the following criteria:
- the installation of your Project must take place on your farm, which should be land that you either own or have a leasehold interest in;
  - you must ensure that the area on which measures are to be situated or installed is suitable;
  - you may choose to do the works yourself or use a third party – you will be responsible to that third party, including for all payments to any third party that you use;
  - you must ensure that all equipment is of satisfactory quality and fit for purpose and has a minimum design life of ten (10) years or such longer period as prescribed by applicable law, regulation or code of practice; and
  - you must ensure that all works are carried out in a workmanlike manner with reasonable skill and care and all relevant authorities are notified, where applicable.
- 3.3.2. You must at all times comply with, and ensure that the Project and any equipment and works comply with, all planning permissions and all applicable laws, regulations, codes of practice, industry guidance and standards in force from time to time, including all applicable:
- British Standards;
  - Environmental legislation and guidance and codes of practice issued by the Environment Agency and Natural England;
  - Health and Safety legislation and codes of practice issued by the Health & Safety Executive (HSE) (and you are responsible for any required notifications to the HSE for construction works); and
  - Agricultural Codes of Good Practice, including Protecting our Water, Soil and Air: A Code of Good Agricultural Practice for farmers, growers and land managers.
- 3.3.3. You must collect and maintain all supporting documents and evidence relating to the Project for a period of 5 years from the date the Project is completed in accordance with section 3.5 below, including:

- all invoices and payment receipts (which must be addressed to you and not dated prior to the date notified to you in accordance with section 3.1 above – you will not be entitled to claim any payments in breach of this requirement) for Project works carried out by third parties;
- all consents, planning permissions, licences and authorisations;
- photographic evidence demonstrating the installation of Project in accordance with these Terms and Conditions (including before and after photographs taken from the same position); and
- any further documentation as requested by us.

3.3.4. You must promptly inform us of any changes to your Project or any of the details set out in your application form.

### **3.4. Risk in your Project**

3.4.1. You acknowledge and agree that you are undertaking the Project at your own cost, expense and risk and that our primary responsibility is to make the grant payment to you in accordance with these Terms and Conditions.

### **3.5. Completion of your Project**

3.5.1. Once you have completed your Project, you will need to notify us and provide us with all of the supporting documents and evidence set out in section 3.3.3 above, together with such other documents and information that we may reasonably request in order to verify that the Project has been completed in accordance with these Terms and Conditions. A failure to provide all supporting information and evidence may invalidate your eligibility to receive the grant payment (in whole or part).

3.5.2. We will then arrange with you a time and date to visit your farm to inspect the Project. If we are satisfied that you have completed the Project in accordance with these Terms and Conditions, we will provide you with written confirmation.

### **3.6. Your continuing obligations**

3.6.1. You will, at your cost and expense, ensure that all equipment installed as part of your Project:

- is properly maintained in accordance with the manufacturer's instructions and all applicable laws; and
- remains in operation in agricultural use on your farm for a minimum period of ten (10) years from the date of installation, unless we have agreed otherwise with you in writing.

3.6.2. A failure to comply with this section (3.6) may result in you having to repay some or all of the grant payment.

## **4. Our rights and obligations**

### **4.1. Payment**

4.1.1. Subject to these Terms and Conditions, the application form and our written confirmation that the Project has been successfully completed in accordance with these Terms and Conditions:

- you will issue to us a valid VAT invoice for the amount of the grant set out in your application form; and
- subject to receipt of your valid VAT invoice and subject to you not being eligible to receive payment if you are receiving funding for any part of the Project from another source, we will pay to you such amount within forty-five (45) days from our receipt of a valid invoice. If you have not completed the Project in accordance with these Terms and Conditions, we reserve the right to not make any payment to you or, in our discretion, make a pro rata payment to you to reflect those elements of the Project



that are compliant with these Terms and Conditions. All payments are subject to administrative checks and other controls we consider necessary.

## **4.2. Liabilities**

- 4.2.1. Our total liability to you will be limited to the grant amount, if any, agreed to be paid subject to these Terms and Conditions.
- 4.2.2. You warrant that in participating in the Project you will not breach any of these terms and conditions and/or warrant you will have all appropriate consents and authorisations in place. You will indemnify us against any loss, damages, costs, expenses or other claims arising from any breach by you of these terms and conditions.

## **5. Withdrawal and termination**

### **5.1. Withdrawal of The Catchment Fund**

- 5.1.1. We reserve the right to withdraw The Catchment Fund at any time. If your application has been approved by us, then we will notify you in writing of any withdrawal of The Catchment Fund and:
- if you have not yet commenced any actions in connection with your Project, then we may terminate your participation in The Catchment Fund and you will no longer be entitled to the payment of the grant; or
  - if you have commenced any part of the Project, then we will agree with you which elements of the Project you are to complete and you may claim the corresponding payment of the grant in accordance with these Terms and Conditions.

### **5.2. Termination of your participation in The Catchment Fund**

- 5.2.1. We may upon written notice to you postpone, withdraw or terminate your participation in The Catchment Fund, if you:
- receive any other funding in respect of a Project (or any item);
  - are no longer a tenant farmer and/or landlord in control of a farm in the Relevant Site and/or no longer authorised to use your farm in the Relevant Site for the Project;
  - commit any material or persistent breach of these Terms and Conditions and in the case of such a breach that is capable of remedy fail to remedy that breach within fourteen (14) days (or such other timeframe we may reasonably require) from the date of written notice to you giving details of the breach and requiring it to be remedied;
  - provide false or misleading information or commit any act of fraud (including using the grant for any other purpose);
  - commit any act or omission, or make any statement or otherwise behave in any manner, which may result in any harm or damage to our reputation or the operation of our business;
  - become bankrupt or insolvent; or
  - are prosecuted for any environmental offence.
- 5.2.2. Without prejudice to any of our rights or remedies (whether under these Terms and Conditions or otherwise) if you are in breach of any of these Terms and Conditions, you will promptly remedy the breach at your own expense to ensure compliance with these Terms and Conditions unless we have notified you of the termination or withdrawal of your participation in The Catchment Fund.

### **5.3. Consequences of Withdrawal or Termination**

- On the termination of The Catchment Fund (or your participation in The Catchment Fund), you will cease to be entitled to any grant payment, save as set out in section 5.1.1 above.
- Save as expressly set out in these Terms and Conditions, the withdrawal of The Catchment Fund or the termination of your participation in The Catchment Fund will

not prejudice or affect any right, power or remedy which has accrued or will accrue to either party prior to or after such withdrawal or termination. The provisions in these Terms and Conditions which expressly or impliedly have effect after termination will continue to be enforceable notwithstanding termination

## **6. General**

### **6.1. Interpretation:** In these Terms and Conditions:

- references to “we”, “us” or “our” means Thames Water Utilities Limited (**company number: 02366661**), and references to “you” or “your” means the applicant, including its employees, agents and contractors;
- references to a “person” include any individual, body corporate, association, partnership, firm, trust, organisation, joint venture, authority or any other entity;
- any words following the words “include”, “includes”, “including” or any similar words or expressions will be construed without limitation and accordingly will not limit the meaning of the words preceding them; and
- an obligation on a party to procure or ensure the performance or standing of another person will be construed as a primary obligation of the first party.

### **6.2. Business:** You confirm that you are acting in the course of your business as a farmer and not as a consumer for the purpose of your application and/or participation in The Catchment Fund.

### **6.3. Notices:** Any formal notice required under these Terms and Conditions may be sent by pre-paid first class post or recorded delivery or delivered to or left at a party’s address. Such notice will be deemed to be served at 9:00am on the third business day after the date of posting or at the time of delivery to a party’s address, as applicable.

### **6.4. No Assignment:** Participation in The Catchment Fund is personal to you and you will not assign the benefit or delegate the burden or otherwise transfer any right or obligation to any other person without our prior written consent. We will not withhold consent in the event of your serious illness, death or long term professional incapacity.

### **6.5. Force Majeure:** A party will not be in breach of these Terms and Conditions or otherwise liable to the other party for any failure to perform or delay in performing its obligations to the extent that such failure or delay is due to any event or circumstance beyond the reasonable control of the affected party, provided that all reasonable steps are taken to mitigate the effect of such event or circumstance.

### **6.6. No Waiver:** A delay in exercising or failure to exercise a right or remedy under or in connection with these Terms and Conditions will not constitute a waiver of, or prevent or restrict future exercise of, that or any other right or remedy, nor will the single or partial exercise of a right or remedy prevent or restrict the further exercise of that or any other right or remedy. A waiver of any right, remedy, breach or default will only be valid if it is in writing and signed by the party giving it and only in the circumstances and for the purpose for which it was given and will not constitute a waiver of any other right, remedy, breach or default.

### **6.7. Illegality:** If any term of these Terms and Conditions is found by any court or body or authority of competent jurisdiction to be illegal, unlawful, void or unenforceable, such term will be deemed to be severed from these Terms and Conditions and this will not affect the remainder of these Terms and Conditions which will continue in full force and effect.

### **6.8. No Partnership or Agency:** Nothing in these Terms and Conditions and no action taken by the parties in connection with them will create a partnership or joint venture between the parties or give either party authority to act as the agent of or in the name of or on behalf of the other party or to bind the other party or to hold itself out as being entitled to do so.

### **6.9. No Third Party Rights:** The parties do not intend that any term of these Terms and Conditions will be enforceable under the Contracts (Rights of Third Parties) Act 1999 by

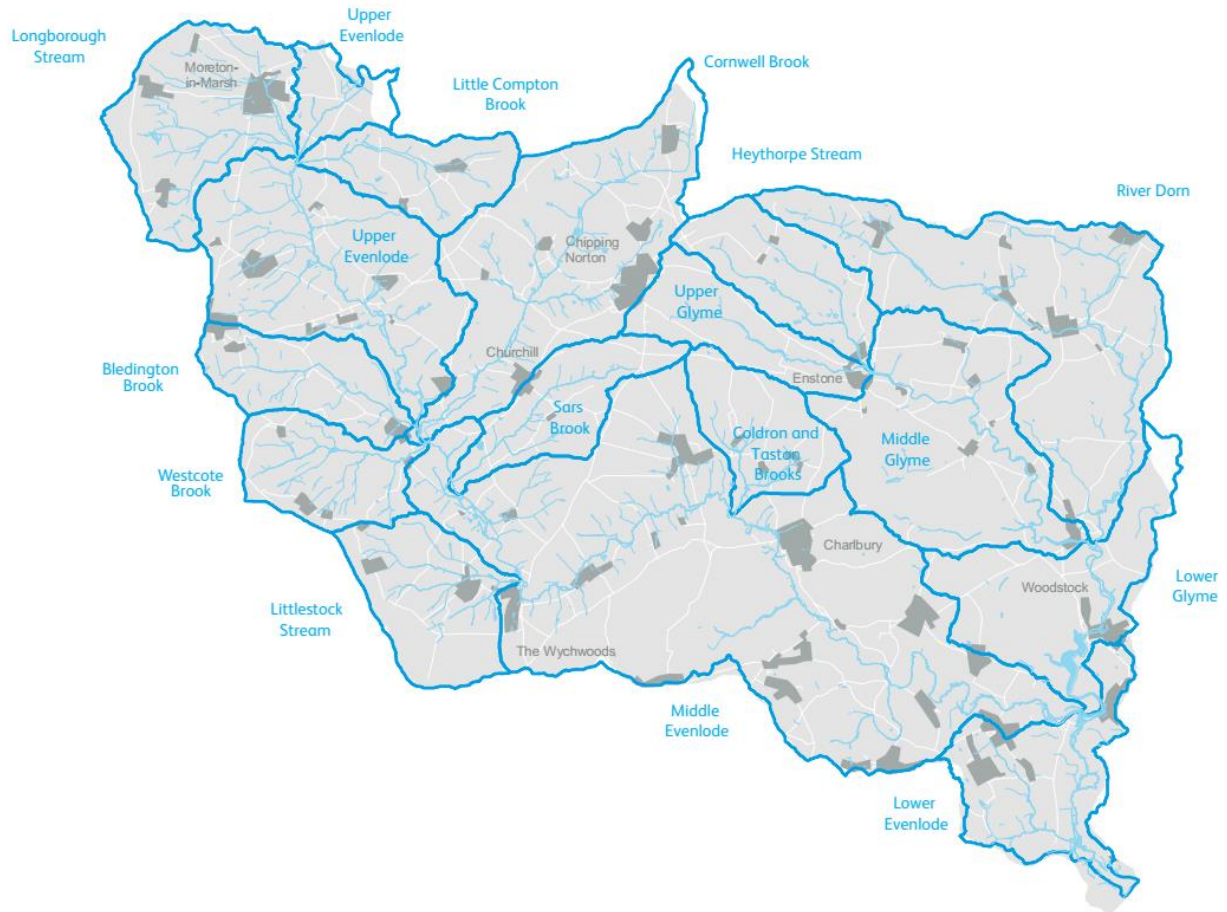
any person.

- 6.10. Entire Agreement:** These Terms and Conditions and all documents referred to herein constitute the entire agreement between the parties and supersede any prior agreement or arrangement in respect of their subject matter. You will not be able to rely on or have any remedy in respect of any misrepresentation, representation or statement (whether made by us or any other person and whether made to you or any other person) which is not expressly set out in these Terms and Conditions. Nothing in this section will be interpreted or construed as limiting or excluding the liability of any person for fraud or fraudulent misrepresentation.

## **7. Dispute Resolution**

- 7.1. Internal Resolution:** In the event of any dispute or difference arising out of or in connection with The Catchment Fund ("Dispute"), our representatives will meet with your representatives to discuss such Dispute in good faith. You agree to make your representatives available on reasonable notice to discuss such Dispute.
- 7.2. Governing Law and Jurisdiction:** These Terms and Conditions and any non-contractual obligations arising out of or in connection with them will be governed by the laws of England and, subject to section 7.1, the courts of England have exclusive jurisdiction to determine any Dispute arising out of or in connection with these Terms and Conditions (including in relation to any non-contractual obligations).

# Schedule A Geographical area covered by the Catchment Fund



# Schedule B Rates for measures included in the Catchment Fund

*Operational measures proposed under the Catchment Fund*

Code	Measure	Rate £	Unit
<b>O1</b>	Reversion to different vegetation		
<b>O1.1</b>	Arable reversion to grassland (or other lower P agricultural practice)	311	per ha / yr
<b>O1.2</b>	Two year sown legume fallow	522	per ha / yr
<b>O2</b>	Change cultivation and tillage practices		
<b>O2.1</b>	Cultivate and till across slope	20	per ha / yr
<b>O3</b>	Protect soils over winter		
<b>O3.1</b>	Winter cover crops	110	per ha / yr
<b>O4</b>	Using vegetation (buffer strips) to intercept water, sediment and nutrients		
<b>O4.1</b>	6m+ buffer strip	353	per ha / yr
<b>O4.2</b>	12m+ watercourse buffer strip	512	per ha / yr
<b>O4.3</b>	In-field grass strip	557	per ha / yr
<b>O4.4</b>	Take small areas out of management	370	per ha / yr
<b>O5</b>	Water features to intercept water, sediment and nutrients		
<b>O5.1</b>	Management of wetlands, ponds, swales and scrapes	site specific	
<b>O6</b>	Farmer innovation		
<b>O6.1</b>	Alternative ways of reducing the amount of phosphorus lost from fields and farmyards to watercourses can be proposed as 'Farmer innovation'	site specific	



*Capital measures proposed under the Catchment Fund*

Code	Measure	Rate £	Unit
<b>C1</b>	Change the way P is applied		
<b>C1.1</b>	Farm nutrient management plan with a focus on P	500	item
<b>C2</b>	Improve soil structure and organic matter		
<b>C2.1</b>	Cultivate compacted tillage soils	20	per ha
<b>C3</b>	Improve management of manure in animal housing and yards (clean and dirty water separation)		
<b>C3.1</b>	Outdoor concrete yard renewal	27.2	per m <sup>2</sup>
<b>C3.2</b>	Underground drainage pipework	5.5	per m
<b>C3.3</b>	Inspection pit / chamber	200	per unit
<b>C3.4</b>	Rainwater goods (e.g. downpipes and gutters)	11.5	per m
<b>C3.5</b>	Below ground storage tank	350	per m3
<b>C3.6</b>	Above ground storage tank	100	per m3
<b>C3.7</b>	Flush rainwater diverters and filters	125	unit
<b>C4</b>	Improve how manure (and silage) is stored		
<b>C4.1</b>	Improvements to dedicated manure (and silage) storage facilities	site specific	
<b>C5</b>	Reduce runoff from tracks and gateways		
<b>C5.1</b>	Gate	150	item
<b>C5.2</b>	Gateway relocation	340	item
<b>C5.3</b>	Resurfacing gateways	92	item
<b>C5.4</b>	Livestock and machinery hardcore track	33	per m
<b>C5.5</b>	Cross drains / cross humps	235	item
<b>C5.6</b>	Installation of piped culvert in ditches	340	item
<b>C6</b>	Water features to intercept water, sediment and nutrients		
<b>C6.1</b>	Creation of wetlands	site specific	
<b>C6.2</b>	Creation of swales		
<b>C6.3</b>	Creation of ponds and scrapes		
<b>C6.4</b>	Creation of bunds		
<b>C7</b>	Keep stock away from watercourses		
<b>C7.1</b>	Post and wire fencing	4	per m
<b>C7.2</b>	Sheep netting fencing	4.9	per m

<b>C7.3</b>	Livestock trough and associated pipework	110	item
<b>C7.4</b>	Hard but permeable base for livestock trough	110	item
<b>C7.5</b>	Pasture pump and associated pipework	220	item
<b>C7.6</b>	Solar panel pumps	660	item
<b>C7.7</b>	Drinking water pipework	2.7	per m
<b>C8</b>	In channel measures to slow flow		
<b>C8.1</b>	Small leaky woody dam	462	item
<b>C8.2</b>	Large leaky woody dam	764	item
<b>C8.3</b>	Check dams	70	item
<b>C9</b>	Farmer Innovation		
<b>C9.1</b>	Alternative ways of reducing the amount of phosphorus lost from fields and farmyards to watercourses can be proposed as 'Farmer Innovation'		



# Appendix B - How to apply

An application form for the  
Evenlode Catchment Fund can be found at:

<https://www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments>







