

## Summary: Intervention & Options

<b>Department /Agency:</b> Defra & WAG	<b>Title:</b> Impact Assessment of the Environmental Damage Regulations (England) and the Environmental Damage Regulations (Wales) 2008	
<b>Stage:</b> Final Regulations	<b>Version:</b> For Chief Economist	<b>Date:</b> 16 December 2008
<b>Related Publications:</b> Regulatory Impact Assessment of the options for implementing the Environmental Liability Directive		

### Available to view or download at:

<http://www.defra.gov.uk/environment/liability>

**Contact for enquiries:** Edward Lockhart-Mummery

**Telephone:** 0207 238 4647

### What is the problem under consideration? Why is government intervention necessary?

The problem is that some activities do not take full account of the risks of causing serious environmental damage in making operational decisions and that environmental damage could be reduced if they did. The Environment Agency reported 744 incidents that had a serious impact on land or water in England and Wales in 2007. Records held by Natural England also reveal a number of serious cases of damage to sites protected for biodiversity each year.

### What are the policy objectives and the intended effects?

The Regulations transpose the EU Directive on Environmental Liability (ELD). The objectives of this policy are to create incentives to minimise the number and severity of cases of environmental damage. It does this by making the polluter pay rather than society where serious cases of damage arise. Government is also concerned to secure these changes in a way that brings about minimum burdens on business.

### What policy options have been considered? Please justify any preferred option.

The first consultation set out the implementation options, including a preference for 'minimum transposition' and options which extend liability, the main ones were to cover all SSSIs, remove defences and extend strict liability to all activities. Following further consideration the government decided to pursue minimal transposition with the exception of extending liability to SSSIs and, in Wales, to remove permit or state of art defences for GMO damage. Options that additionally removed defences (more broadly than for GMOs in Wales) and extended liability have marginally higher NPVs but are associated with higher burdens on business.

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?** ELD requires a report to the EU in 2013. The Government proposes to review the impacts and effectiveness of the Regulations covering the issues, including GMOs, identified in Article 18.3 of ELD.

### **Ministerial Sign-off** For SELECT STAGE Impact Assessments:

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:

..... Date:

## Summary: Analysis & Evidence

Policy Option: 1

Description: Existing regulations stay in place but Environmental Liability Directive is not transposed

<b>COSTS</b>	<b>ANNUAL COSTS</b>		Description and scale of <b>key monetised costs</b> by 'main affected groups' Government would face fines from the European Commission for infringing EU law. Daily fines of £60k to £100k have been known. Society will continue to bear the costs when damage occurs.
	<b>One-off</b> (Transition)	<b>Yrs</b>	
	£ 22m - 37m	1	
	<b>Average Annual Cost</b> (excluding one-off)		
	£ 14m		<b>Total Cost (PV)</b> £ 150m
Other <b>key non-monetised costs</b> by 'main affected groups'			

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>		Description and scale of <b>key monetised benefits</b> by 'main affected groups' None
	<b>One-off</b>	<b>Yrs</b>	
	£		
	<b>Average Annual Benefit</b> (excluding one-off)		
	£		<b>Total Benefit (PV)</b> £
Other <b>key non-monetised benefits</b> by 'main affected groups'			

Key Assumptions/Sensitivities/Risks

Price Base Year 2005	Time Period Years 10	<b>Net Benefit Range (NPV)</b> £	<b>NET BENEFIT (NPV Best estimate)</b> £ -150m
-------------------------	-------------------------	-------------------------------------	---------------------------------------------------

What is the geographic coverage of the policy/option?	England, NI, Wales			
On what date will the policy be implemented?	N/A			
Which organisation(s) will enforce the policy?	N/A			
What is the total annual cost of enforcement for these organisations?	£ N/A			
Does enforcement comply with Hampton principles?	Yes/No			
Will implementation go beyond minimum EU requirements?	N/A			
What is the value of the proposed offsetting measure per year?	£ N/A			
What is the value of changes in greenhouse gas emissions?	£ N/A			
Will the proposal have a significant impact on competition?	Yes/No			
Annual cost (£-£) per organisation (excluding one-off)	Micro N/A	Small N/A	Medium N/A	Large N/A
Are any of these organisations exempt?	Yes/No	Yes/No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)			(Increase - Decrease)	
Increase of	£ N/A	Decrease of	£ N/A	<b>Net Impact</b> £ N/A

Key: Annual costs and benefits: Constant Prices

## Summary: Analysis & Evidence

**Policy Option: 2**

**Description: Assessment of the Regulations. Minimum except for an extension of liability to SSSIs and no permit or state of the art defences for GMOs in Wales.**

<b>COSTS</b>	<b>ANNUAL COSTS</b>		Description and scale of <b>key monetised costs</b> by 'main affected groups' Costs of remediating damage or choosing to take anticipatory measures: agriculture (35%), manufacturing (11%), waste (17%), water (12%). Costs of enforcement. The total costs (present value) of minimal transposition (i.e. without extending to SSSIs and retaining permit and state of the art defences for GMOs in Wales) would be £92m – i.e. £2m lower than for the Regulations.
	<b>One-off</b> (Transition)	<b>Yrs</b>	
	£ 4.1m		
	<b>Average Annual Cost</b> (excluding one-off)		
	£ 15m	<b>Total Cost (PV)</b>	<b>£ 94m</b>
Other <b>key non-monetised costs</b> by 'main affected groups' Costs of insurance (minus cost savings from not paying for remediation under these and other regulations) cannot reliably be assessed but very few businesses are expected to take out insurance as a result of this measure and it is expected to increase estimated costs by a small proportion.			

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>		Description and scale of <b>key monetised benefits</b> by 'main affected groups' Additional remediation of rivers, habitats and species and land contamination with benefits to society (80% of the estimate). Reduced damage and risks to the environment (20%). The total benefits (present value) of minimal transposition would be £116m – i.e. £5m lower than for the Regulations. Therefore the net benefit of extending to SSSIs and removing defences is expected to be £3m.
	<b>One-off</b>	<b>Yrs</b>	
	£		
	<b>Average Annual Benefit</b> (excluding one-off)		
	£ 19m	<b>Total Benefit (PV)</b>	<b>£ 121m</b>
Other <b>key non-monetised benefits</b> by 'main affected groups' The benefits of taking anticipatory measures are expected to be at least as great as the costs. The estimates in this IA assume benefits are equal to costs and so do not take account of the element of net benefit.			

**Key Assumptions/Sensitivities/Risks** Assumptions: Past can inform estimate of future damage; value of benefits of existing environmental improvements inform estimates of future improvements. Sensitivities: Numbers of severe cases and marine cases. Risks: challenge to determine when regs apply, litigation, assessment costs may be high.

Price Base Year 2005	Time Period Years 10	<b>Net Benefit Range (NPV)</b> <b>£ 13m - 88m</b>	<b>NET BENEFIT (NPV Best estimate)</b> <b>£ 27m</b>	
-------------------------	-------------------------	------------------------------------------------------	--------------------------------------------------------	--

What is the geographic coverage of the policy/option?		England, NI, Wales		
On what date will the policy be implemented?		December 2008		
Which organisation(s) will enforce the policy?		EA/NE/LAs/MFA/CCW		
What is the total annual cost of enforcement for these organisations?		£ 0.6m		
Does enforcement comply with Hampton principles?		Yes		
Will implementation go beyond minimum EU requirements?		Yes		
What is the value of the proposed offsetting measure per year?		£ Offset defrawide		
What is the value of changes in greenhouse gas emissions?		£ None		
Will the proposal have a significant impact on competition?		No		
Annual cost (£-£) per organisation (excluding one-off)	Micro 25%	Small 25%	Medium 25%	Large 25%
Are any of these organisations exempt?	No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)		(Increase - Decrease)	
Increase of	£ 1.4m	Decrease of	£
		<b>Net Impact</b>	<b>£ 12m</b>

Key: Annual costs and benefits: Constant Prices (Net) Present Value

## Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

### **Introduction**

- 1 This is the Impact Assessment (hereafter: IA) of the Environmental Damage Regulations (hereafter: the Regulations) which implement Directive 2000/35 on environmental liability in England, Wales and Northern Ireland. There will be separate regulations in each of England<sup>1</sup>, Northern Ireland and Wales.
- 2 In the first consultation on the implementation of the Directive the Government sought the public's views on the options for implementation. The consultation and accompanying Regulatory Impact Assessment are available at: <http://defraweb/environment/liability/index.htm> and <http://new.wales.gov.uk/consultations/closed/envandcouncloscons/1313627/?lang=en> respectively. The options presented in that consultation and RIA were:
  - Do nothing
  - Minimum transposition (i.e. limiting liability for operators by not extending liability in any way and retaining all defences). The Government indicated that this was its preferred option (except that the permit defence and state of the art defence would not apply for damage from GMOs in Wales).
  - A total of 12 variations to minimum transposition the main ones were to use a site integrity test for biodiversity damage, to extend liability to SSSIs, to remove the permit and state of the art defences and to extend strict liability to all activities
- 3 Following further consideration the Government decided to retain a minimum implementation option (including not applying the defences for GMOs in Wales) but with an extension to liability to cover damage to SSSIs, using a site integrity test. A second consultation was undertaken with regulations and guidance drafted on this basis. An accompanying IA included summary sheets for the main options previously considered including the position reflect in the Regulations at option 3:
  - i) Do nothing
  - ii) Minimum transposition
  - iii) Minimum transposition + SSSIs (i.e. the Regulations)
  - iv) Minimum transposition + SSSIs + removal of permit defence
  - v) Minimum transposition + SSSIs + removal of permit defence + extend strict liability to all activities
- 4 Some improvements have been made to the drafting of the Regulations following comments made during the second consultation but the policy position reflected has remained, in substance, the same. This Final IA includes two options: do nothing and the final Regulations. Its evidence base focuses on providing the evidence to support the assessment of the impact of the Regulations. Changes have been made to the analysis where further information has become available. The most significant is that the estimate of amount of damage to species and habitats falling within the scope of the Regulations has reduced on the basis of more recent data.

### **Background to the Regulations**

---

<sup>1</sup> In England: The Environmental Damage (Prevention and Remediation) (England and Wales) Regulations 2008

5 The Regulations contain requirements for responding to certain imminent threats and actual cases of environmental damage. There are already provisions in England, Northern Ireland and Wales covering a wide range of damage to the environment and these will remain in place. The Regulations include specific definitions of environmental damage which mean that they apply only to the most serious cases of damage to protected species and natural habitats, water damage and land contamination. To put this in context there are on average over 30,000 cases of damage to the environment each year and the Regulations are expected to cover less than 1% of these.

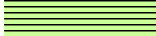


6 For the cases that they cover the Regulations may lead to additional costs and benefits either:

- i) where they introduce liability where there may not have been any before because
- Land contamination caused by organisms and micro-organisms is covered
  - Liability covers species and habitats outside protected sites including in the marine environment for which were not covered to any significant degree before
  - There is a duty on operators to report damage and take corrective steps and a duty, rather than a power, for authorities<sup>2</sup> to require that measures are taken which means that cases may come to attention that did not previously
  - Remediation of species and habitats can be required without first securing a prosecution

or:

- ii) Where their requirements are more stringent than previous requirements.
- ‘Complementary’ and ‘compensatory’ remediation is required as well as ‘primary’ remediation for relevant cases of damage to species and protected natural habitats and water damage

7 Table 1 below outlines what, in broad terms, the main changes are for the types of damage covered by the Regulations, highlighting (in colours/patterns as indicated) where the Regulations:

- are equivalent to existing arrangements; 
- where they are less extensive than existing arrangements 
- where they exceed existing arrangements. 

**Table 1: The Regulations compared with existing legislation**

Damage to:	Species and habitats	Water	Land
<b>Threshold/ scope of damage</b>	Regs apply to damage to integrity of SSSIs <i>whereas less serious damage is potentially caught currently</i>	Regs apply to significant effects on the status of water <i>whereas any pollution of waters is currently covered</i>	Regs cover significant risks to human health: <i>a lower threshold than some regulations and a higher threshold than others</i>
	Regs apply to significant effects on EU-protected species and habitats <u>wherever</u> found which is not currently subject to liability		Regs cover damage from contamination by organisms/micro-organisms <i>which is not currently covered.</i>
<b>Remedial standard</b>	Regs require return to equivalent of baseline and	Regs require return to baseline and interim	Regs require that significant risks to

<sup>2</sup> In England these are: the Environment Agency, Local Authorities, Natural England and the Marine and Fisheries Agency



	compensation for interim loss <i>whereas existing arrangements only require return to existing condition if possible</i>	loss <i>whereas E,W,NI law only requires return to previous condition 'if reasonably practicable'</i>	human health be removed <i>which is less stringent than existing regimes for new damage</i>
<b>Duties on operators</b>	Duty to notify authority of damage and imminent threats and to take immediate action. This duty does not generally exist currently except in regulatory regimes such as PPC, waste and to a limited extent to protected sites legislation.		
<b>Duties/ powers for authority</b>	Duty to require preventive and remedial measures <i>whereas currently remedial measures can only be required following prosecution</i>	Duty to require preventive and remedial measures <i>whereas powers in existing law</i>	Regs duty to require preventive measures and remedial measures <i>is more immediate than duty in Part IIA and equivalent to PPC and waste regs</i>
<b>Activities covered</b>	Regs contain liability for all activities with certain exceptions. <i>Existing arrangements apply to all activities (although in different circumstances)</i>	Regs only apply to activities in Schedule 2 and some activities are excluded <i>whereas existing law applies to all activities</i>	Regs only apply to activities in Schedule 2 and some activities are excluded <i>whereas existing law applies to all activities</i>
<b>Nature of liability regime</b>	In Regs liability is strict for Schedule 2 activities and fault-based for other activities. <i>Currently remediation can only be required following prosecution.</i>	Liability is strict in Regs <i>and in existing arrangements</i>	Liability is strict in Regs <i>and in existing arrangements</i>
<b>Defences to liability for costs</b>	Regs have a defence against remedial costs if the event causing damage was expressly authorised by specified permits, not thought likely to cause damage or occurred more than 30 years before. <i>Such defences do not currently exist.</i>		

### Types of cost and benefit arising

8 Additional costs and benefits are likely to arise from the Regulations in the following ways:

- In some cases the Regulations will require more remediation than currently required under existing arrangements. This will either be because the Regulations require some remediation where none was previously required (such as for damage in the marine environment or where there is land contamination from organisms and micro organisms), or because the Regulations will require remediation to higher standards than previously (such as where they apply for water damage or damage on SSSIs). This extra remediation will result in:
  - i) increased costs to those responsible for the damage
  - ii) benefits to society from an improved environment
- Businesses may choose to take some anticipatory action in response to a perception that they will be responsible for increased costs if they cause damage<sup>3</sup>. This action could include, for example, assessing risks or taking additional precautionary measures. This anticipatory action may result in:
  - i) increased costs in the short-term to the businesses that take action (and a likely reduction in the risk of causing damage and consequent costs in the longer term)

<sup>3</sup> This is an example of what economists refer to as 'internalisation' of the costs of environmental damage because operators take account of the risk of causing damage in making operational decisions – i.e. the risk is now 'internal' to operational decision-making.

- ii) benefits to society to the extent that anticipatory action reduces the number or severity of environmental incidents
- The relevant authorities will have new responsibilities. They will face:
  - i) costs as a result of setting up appropriate systems to be able to enforce the Regulations
  - ii) costs where they take action in response to imminent threats and actual environmental damage to the extent that they cannot recover them from responsible operators
- Some businesses will also take time to learn about the new rules.
  - i) time spent learning will have a cost implication to those businesses.

The detailed approach to assessment is at Annex 1.

### **Evidence supporting conclusions**

9 Table 2 breaks down the figures provided in the *Summary: Analysis and Evidence* page for option 2 (the Regulations) and this section provides an overview of the evidence to support them. In particular it provides evidence on:

- the potential level of damage caught by the Regulations
- the costs and benefits of additional remediation in response to that damage
- the estimated costs and benefits of anticipatory actions businesses might choose to take
- how costs fall by sector
- the costs of enforcing the regime
- the policy and administrative costs and the ‘admin burden’ of the Regulations (including compliance with Hampton and ‘offsetting measures’)
- the wider impacts of the Regulations
- the specific impact tests
- costs and benefits through time and in context
- the sensitivity of results to key assumption

More detailed information on the approach can be found in annexes B and C of the previous version of the Regulatory Impact Assessment<sup>4</sup>. Specific references to that assessment are made in this section.

**Table 2: Costs and benefits of the environmental damage Regulations**

ADDITIONAL ACTIVITY	SUMMARY	COSTS £M	BENEFITS £M
<i>Annual (with one-off costs in brackets)</i>			
<b>IMMINENT THREAT</b>	Mainly provided for in existing arrangements except e.g. in marine environment. Measures may be taken more rapidly with some implications	Unlikely	Unlikely
<b>REMEDIAL ACTION</b>			
<b>Species and habitats</b>	Av. of 10 cases pa with occasional severe case.	<b>1.3</b> 0.2 – 2.3	<b>2.8</b> 0.5 – 6.8
<b>Water</b>	Av. of 5 cases pa with occasional severe case.	<b>0.9</b> 0.2 - 3.1	<b>2.0</b> 1.2 – 2.8
<b>Land</b>	Estimate assumes that duty on operators and damage from organisms will lead to more cases – speculative estimate of 48	<b>2.5</b> 1.0 – 4.8	<b>6.4</b> 3.2 – 19.3

<sup>4</sup> <http://www.defra.gov.uk/corporate/consult/env-liability/consultation.pdf>

<b>Assessment/admin</b>	Assessment of damage and admin and management of remediation and costs recovered from operators	<b>1.8</b> 0.4 – 6.4	
<b>ANTICIPATORY ACTION</b>			
<b>Anticipatory action</b>	A range of measures may be taken and estimates made by extrapolating information from sector focus groups	<b>7.5</b> 4.7 – 14.6	<b>&gt;7.5</b> 4.7 – 14.6
<b>Familiarisation</b>	Time take to familiarise (and re-familiarise) with rules. On basis of information from businesses	<b>0.7 (3.7 in 1<sup>st</sup> yr)</b> 0.3 – 3.9	
<b>ENFORCEMENT</b>			
<b>Recurrent non-recoverable activities</b>	Cost of some activities will not be recoverable such as costs of investigating cases where no damage	<b>0.7</b>	
<b>Setting up systems</b>	Establishing expertise and mechanisms on entry of Regulations	<b>(1.1)</b>	
<b>WIDER EFFECTS</b>			
<b>Small businesses</b>	SMEs cause 50% of damage and costs will be higher in proportion to companies' cost bases		
<b>Competition/competitiveness</b>	Competition filter demonstrates no effect on competition. Unlikely to affect international competitiveness		
<b>Business opportunities</b>	Potential for opportunities in environmental and insurance sectors – no net gain to economy		
<b>Improved environment/health</b>	Knock-on benefits to health and local environment from reduced damage and environmental enhancement		
<b>Permit defence</b>	Permit conditions may tighten leading to increased costs of compliance		
<b>ANNUAL TOTAL</b>		<b>15</b> (7 - 32)	<b>&gt;19</b> (11 - 39)
<b>Admin burden*</b>		<b>1.4</b> <b>(£4m in 1<sup>st</sup> year)</b>	
<b>TEN YEAR TOTAL</b>		<b>94</b>	<b>&gt;121</b> <b>NPV: &gt;27</b>

\* This includes those costs that fall on business and include the costs of reporting damage, corresponding with the authority and the costs of familiarisation with the new rules.

## Assessment of additional remedial action

### *Damage to species and habitats<sup>5</sup>*

#### Introduction

10 The basis for this assessment of the costs and benefits of additional remediation in response to damage to species and habitats is as follows:

- i) *The threshold for damage to species and habitats would be either that a significant adverse effect on reaching or maintaining the favourable conservation status of relevant species and habitats has occurred, or that there is an effect on the integrity of a SSSI.*
- ii) *Relevant habitats and species are those in the Annexes of the Habitats Directive and the Birds Directive as referred to in Regulation 2 of the Regulations for England, on 'interpretation'.*
- iii) *Strict liability applies for Schedule 2 activities and fault-based liability applies for non Schedule 2 activities.*
- iv) *The permit defence and state of the defence are applied except for GMOs in Wales.*

<sup>5</sup> More detail provided in Annex B of the RIA (paras 10-68)



v) All exceptions apply.

The detailed assessment of damage to specie and habitats is at Annex 2

Summary table

**Table 3: remedial measures for damage to species and habitats: Best estimates in bold**

<b>Bracket</b>	<b>Numbers of EWNI cases</b>	<b>Costs per case £'000</b>	<b>Assess /admin costs £'000</b>	<b>Total EWNI costs £m pa</b>	<b>Total EWNI benefits £m pa</b>
SSSI integrity (excl.FCS)	<b>6 pa</b>	<b>22</b> 10 - 60	<b>9</b> 4 - 36	<b>0.2</b> 0.1 – 0.6	<b>0.3</b>
Terrestrial FCS	<b>2 pa</b> <b>0.1 - 10</b>	<b>100</b> 25 - 400	<b>60</b> 15 - 240	<b>0.3</b> 0.1 – 1.6	<b>0.4</b>
Marine FCS	<b>1 in 3 yrs</b> <b>0.1 – 3 (pa)</b>	<b>800</b> 100 – 2,000	<b>160</b> 40 – 640	<b>0.3</b> 0.0 - 0.9	<b>0.5</b>
Severe cases	<b>1 in 5 yrs</b> <b>0.02 – 0.5 (pa)</b>	<b>5,000</b> 1,000– 10,000	<b>320</b> 80 -1280	<b>0.8</b> 0.2 - 2.3	<b>1.6</b>
<b>Best estimates of total annualised costs and benefits</b>				<b>1.6</b> 0.4 – 5.4	<b>2.8</b>

11 Key points to note on estimates:

- i) Estimates are provided as averages over a number of years: the actual numbers are expected to fluctuate from year to year.
- ii) A best estimate is provided for convenience but accompanying ranges provide a more realistic view. In column 5, these ranges keep the level of damage constant but reflect the potential range of costs per case.
- iii) It is possible that the Regulations will in some cases lead to imminent threats being addressed more rapidly but this effect has not been quantified.
- iv) Little relevant marine data exist so the marine assessment has relied more heavily on judgement.
- v) The extent to which cases of damage in the marine environment are identified will influence the impact of the Regulations.
- vi) In practice data requirements may make it challenging to assign liability which may mean fewer cases will lead to action.
- vii) Little relevant data exist outside protected sites and so it is not possible to predict precisely how many, if any, cases will occur.
- viii) Benefits transfer is a relatively crude technique although adjustments can and have been made for some differences between study and policy sites.
- ix) Benefits estimates do not generally take account of the full range of benefits from remedial measures.
- x) Available studies from which benefits values are taken may tend to value more important features so may overvalue benefits, although the Regulations are also concerned with features designated for their importance at EU level.
- xi) In respect of Wales, no relevant GMO data currently exists on which to base assessment

## Water damage<sup>6</sup>

### Introduction

12 The basis of the assessment of water damage is as follows:

- i) *The definition of water damage would be put into practical effect on basis of the mechanisms developed under the Water Framework Directive for assessing status.*

<sup>6</sup> More detail in Annex B of the RIA (paras 69-81)

- ii) *Strict liability is for Schedule 2 activities only.*
- iii) *The permit defence and state of the art defence apply except for GMOs in Wales*
- iv) *All exceptions apply.*

The approach to assessing remedial measures for water damage is at Annex 3.

Summary table

**Table 4: remedial measures for water damage: Best estimates in bold**

<b>Bracket</b>	<b>Numbers of EWNI cases</b>	<b>Costs per case £'000s</b>	<b>Assess/admin costs £'000</b>	<b>Total EWNI costs £m pa</b>	<b>Total EWNI benefits £m pa</b>
Regular	<b>5 pa</b> 1 – 12 (pa)	<b>105</b> 25 - 500	<b>50</b> 10 - 200	<b>0.8</b> 0.2 – 3.5	<b>1.2</b>
Severe cases	<b>1 in 10 yrs</b> 0.01 – 0.5 (pa)	<b>5000</b> 1000-10000	<b>300</b> 80 - 1200	<b>0.5</b> 0.1 – 1.1	<b>0.8</b>
<b>Best estimates of total annualised costs and benefits</b>				<b>1.3</b> 0.3 – 4.6	<b>2.0</b>

13 Key points to note on estimates:

- i) Estimates are provided as averages over a number of years and year to year fluctuations would be expected in practice.
- ii) It is assumed that any case that falls under the Regulations would previously have come to attention and been subject to some requirements and that therefore that the Regulations in themselves will not lead to cases that were not previously addressed coming to attention.
- iii) Cost and benefit estimates are national averages, whereas in practice costs and benefits of individual cases will depend on local circumstances.
- iv) Further assessment of the benefits of river improvements is being undertaken for the purposes of the Water Framework Directive. It will be considered whether this information can be used to revise the IA.

### Land damage<sup>7</sup>

Introduction

14 This assessment is based on the following:

- i) *It is assumed that the threshold for human health effects is the same as currently used for Part IIA of the Environmental Protection Act 1990 (“Part IIA”).*
- ii) *Damage from organisms and micro-organisms is included.*
- iii) *Strict liability is for Schedule 2 activities only.*
- iv) *The permit defence and state of the art defence apply except for GMOs in Wales.*
- v) *All exceptions apply.*

It is important to remember that the Regulations only apply to damage that occurs after the Regulations come into force.

15 There are already remedial requirements in place in existing regimes which are in some respects more rigorous than in the Regulations. There are, however, three characteristics of the Regulations which may mean further investigation and remediation will be undertaken once they are in place.

- i) The duty in the Regulations on operators to take immediate action and notify authorities is new and not mirrored in all existing regimes. Under Part IIA, for example, the onus is on Local Authorities to identify and address cases of contaminated land. This new duty

<sup>7</sup> More detail in Annex B of the RIA (paras 82-110)

may in some cases lead operators to take remedial action where they would not previously have done. It is difficult to predict whether in practice operators will 'self-enforce'.

- ii) While those with Environmental Permitting Programme ("EPP" permits are subject to remedial requirements for more broadly defined damage and have to remediate to a higher standard, the Regulations potentially catch risks of less serious health effects.
  - iii) The inclusion of land damage from organisms and micro-organisms may capture cases that were not previously caught.
- 16 The assessment reviews what happens under existing arrangements and then makes some assumptions about what impact these two differences (the duty on operators and the inclusion of organisms and micro-organisms) will have.

*The approach to assessing remedial measures for land damage is at Annex 4.*

#### Summary table

**Table 5: remedial measures for land damage: Best estimates in bold**

<b>Bracket</b>	<b>Numbers of EWNI cases</b>	<b>Costs per case £'000s</b>	<b>Assess/admin costs £'000</b>	<b>Total EWNI costs £m pa</b>	<b>Total EWNI benefits £m pa</b>
Land	<b>48 pa</b> 0- 120	<b>52</b> 20 - 100	<b>20</b> 10 - 50	<b>3.5</b> 1.4 – 7.2	<b>6.4</b>

- 17 Key points to note:
- i) Estimates are provided as averages over a number of years and year to year fluctuations would be expected in practice.
  - ii) An assumption has been made that the mechanism in the Regulations and the explicit inclusion of organisms will lead to more reported cases and a suggested proportion increase has been used although there is no reference data for the increase.
  - iii) The assessment of costs and benefits has made the general assumption that remediation would not have occurred in the absence of the Regulations and therefore that any costs would not be incurred at all in the absence of the Regulations and that any damaged assets or resources would be lost in perpetuity. This assumption does not necessarily hold because the effect of the Regulations may be for contamination to be remedied more rapidly. The assessment has also necessarily been based on cases that have come to attention in the past which may not necessarily be an accurate proxy for those that additionally come to attention under the Regulations.
  - iv) It has been assumed that the costs of responding to cases of land contamination caused by organisms and micro-organisms is broadly comparable to those relating to contamination from substances.
  - v) In addition to any cases where remediation is undertaken where it would not have been under existing arrangements, the Regulations may lead to remediation being funded by operators where it would previously have been funded publicly. This may arise in cases where under Part IIA a 'hardship' provision<sup>8</sup> would have been invoked but the Regulations would apply as it contains no such provision. Examination of records from the Defra Programme show less than one case of Regulations-type damage per year where 'hardship' has been invoked.

<sup>8</sup> One existing regime, Part IIA, has a 'hardship' provision whereby a Local Authority may, under certain circumstances, decide not to require an operator to pay and may instead pay for remediation itself or with assistance from Defra Capital Projects Programme in England and the Contaminated Land Capital Fund in Wales.

## Business anticipatory response to the Regulations<sup>9</sup>

### *Introduction*

18 The requirements of the Regulations only bite when there is damage or an imminent threat of damage. These preventive and remedial requirements will lead to costs for the responsible businesses. In addition to costs in response to these specific events, operators may decide to take action as a result of the changes to reduce the risk of causing qualifying damage for example by investing in measures to reduce the risk of causing damage or by taking out insurance: these costs are estimated at **£7m for operators in England, Northern Ireland and Wales**. The costs of actions taken were also estimated on the basis of workshops and interviews with individual businesses to ask them what they would actually do and these estimates were cross-checked with trade associations. The summary results are presented in table 6 below.

### *Action businesses take to reduce exposure to risk of liability*

#### Risk assessment

19 Some businesses will undertake additional risk assessment to work out their exposure to increased costs. This could take a variety of forms. For smaller businesses it might involve a visual inspection of aspects of their activities that may give rise to risks, or research into the location of sensitive environmental features. Some businesses may seek external advice.

#### Precautionary measures

20 Some businesses may decide to take measures to reduce their risks. In simple terms, the decision made by companies considering taking measures is whether it is more economical to invest in precautionary measures than to bear the risk of increased costs associated with causing damage under the Regulations. Businesses will also have different attitudes to risk which will affect the way they respond to liability. For some companies reputational damage may be a more important consideration than the immediate costs of remedial works; while for others, value creation to shareholders might be more important and they may be more likely to bear additional risks which they believe might be remote.

21 Companies will vary in their ability to assess risks and may under- or over- invest as a result. Larger businesses may typically have access to more sophisticated techniques and may therefore be more likely to take measures and reduce their exposure to damage in the future which may have some influence on the relative proportion of damage for which small and large businesses are responsible. Many companies thought that the Regulations would not be the single factor determining whether or not to make operational changes but that it would be a consideration and in some cases make the difference between making an investment or not.

#### Baseline assessment

22 Remediation of water damage and damage to species and habitats requires return to baseline condition (the condition before the damage took place) which is to be estimated on the best information available and the Regulations only apply to damage that takes place after the Regulations come into effect. For these reasons some companies may decide to record the 'baseline condition' of the environment surrounding their operations although discussions suggest that this will be very rare. Where it does occur it might

---

<sup>9</sup> Annex E of the RIA has more detailed information about the assessment of anticipatory measures.

involve for example taking photographs, taking chemical samples and monitoring species. There may however, be wider data sources for example from monitoring under the Water Framework Directive which the operator and competent authority will need to take account of when determining baseline when damage arises.

## Insurance

- 23 For some companies transferring risk using insurance products may be attractive. However, after many insurers suffered significant financial losses in the 1980s, general insurance policies only cover environmental risk to a very limited extent. A separate 'Environmental Impairment Liability' (EIL) market developed in the US in the early 1990s and US insurers have since opened markets in the UK and Europe. Cover in the UK is generally restricted to a few sectors and is purchased for liability for historic contamination during property transactions. The purchase of policies for operational risk is not widespread. There is now only a handful of significant players in the UK EIL market with annual premium income totalling significantly less than £100m.
- 24 Generally, very few companies purchase cover for operational risks where it is available and it is difficult to envisage that liabilities under the Regulations will trigger significant change in this respect given that at an industry-wide level the additional costs of remediation are expected to be relatively low. The key players in the EIL market have recently begun to offer products to cover the provisions of the Environmental Liability Directive. Products are currently restricted in terms of the amounts covered, the deductibles (or 'excesses') and the exclusions and without a track record of costs incurred they may be disproportionately expensive. These factors will limit the extent to which they are accessible to operators within the scope of the Regulations. If, as expected, there is limited demand for products it may take time for good value products to develop.
- 25 The precise extent to which businesses will decide to take out insurance, or extend insurance policies to cover damage covered by the regulations, is uncertain and the ensuing costs and benefits (cost savings and any environmental effects from change in behaviour) are not included in the final estimates. They are expected to be very small, however, and would perhaps increase the estimates of anticipatory action by a small proportion.

**Table 6: Costs of anticipatory actions per year by sector**

Sector	£'000s	%
Arable	332	4%
Beef and sheep	953	13%
Dairy	572	8%
Pig and Poultry	128	2%
Land management and other agriculture	846	11%
Forestry	46	1%
Fisheries and fish farming	118	2%
Construction and demolition	371	5%
Electricity and gas	176	2%
Land transport	273	4%
Water, Air and other transport	190	3%
Mineral extraction	77	1%
Waste and recycling	756	10%
Water supply and treatment	1,229	16%
Retail/wholesale of fuel etc.	252	3%
Manufacture of chemicals	181	2%
Manufacture of coke and petroleum products	108	1%

Man of food and beverage	86	1%
Man. of metals	71	1%
Other manufacturing	462	6%
Other <sup>10</sup>	270	4%
<b>Total</b>	<b>7,495</b>	<b>100%</b>

## Benefits of business response to Regulations

- 26 There are likely to be benefits associated with the anticipatory actions outlined above. In general terms the rationale for assessing and taking these measures is to reduce exposure to additional risk of costs introduced by the Regulations: either reducing the probability of causing damage or the extent of costs in the event of damage. Assuming businesses understand their risks accurately and how their actions can reduce those risks (which may not always be the case), they will take measures where it is more economical to do so than to bear risks. In effect they are balancing risk and cost reducing risk incrementally where the cost of doing so is cheaper than the benefits. If they do this, and certain other conditions hold (set out in Annex E of the RIA), the benefits of actions businesses take will exceed the costs; the overall benefits of anticipatory actions would therefore be expected, at minimum, to exceed costs.
- 27 Key points to note:
- i) Estimates are based on extrapolation from a relatively small sample of businesses; there could be a bias in the estimates if companies interviewed were not representative of the population of all operators likely to be affected by the Regulations.
  - ii) Businesses may not be able to predict in advance and particularly before regulations are available precisely what they will do particularly where the introduction of the Regulations is one of many other risks that they have to take account of. It is therefore uncertain exactly how and when they will respond to additional risk. For example, there may be a time lag as businesses absorb the new changes before they take action.
  - iii) The greatest source of uncertainty with the estimates may be the extent to which businesses will take out additional insurance.

## Familiarisation costs

- 28 Operators may also decide to invest time in familiarising themselves with the new liability rules. The cost associated with the latter action is estimated at about **£4m to operators in England, Northern Ireland and Wales in the first year decreasing to less than £1m thereafter**. This was assessed on the basis of information gathered in workshops extrapolated across all of industry.
- 29 The costs that businesses incur in learning about the new rules are an administrative cost and do not lead directly to any environmental benefits. Without businesses knowing about the rules, however, they are unlikely to work effectively so awareness of the new rules is an essential pre-requisite to businesses taking additional measures which in turn has benefits.

## Costs by sector<sup>11</sup>

- 30 An indication of how the total costs might be apportioned by sector is presented in table 7 below. Records of damage over longer timescales are used as the basis for this apportionment. 'Total costs' include both the costs incurred in response to damage and the costs of the anticipatory measures businesses take.

<sup>10</sup> Other includes operators who are not businesses such as public bodies and non-governmental organisations

<sup>11</sup> Annex D of the RIA has more detailed information about the assessment of how costs are allocated by sector



- 31 Businesses in the **farming and land management** sector are likely to face the highest proportion of costs – an estimated 36% of total costs. These costs will largely be borne by those who manage land where important habitats and species are located and those who cause major contamination of land, surface waters and groundwater.

**Table 7 Total additional costs of the Regulations by sector**

Sector	Remediation costs	Total costs £'000s	% of total costs
Arable	201	533	4%
Beef and sheep	363	1,316	10%
Dairy	376	949	7%
Pig and Poultry	103	231	2%
Land management and other Agricultural Source	841	1,687	12%
Forestry	66	112	1%
Fisheries and fish farming	153	271	2%
Construction and demolition	246	616	4%
Electricity and gas	69	245	2%
Land transport	333	606	4%
Water, Air and other transport	43	233	2%
Mineral extraction	86	163	1%
Waste and recycling	1,613	2,369	17%
Water supply and treatment	496	1,725	12%
Retail/wholesale of fuel etc.	175	426	3%
Man. of chemicals	113	294	2%
Man. of coke and petr products	10	118	1%
Man. of food and beverage	49	135	1%
Man. of metals	22	93	1%
Other manufacturing	365	826	6%
Other	625	895	6%
<b>Total</b>	<b>6,347</b>	<b>13,842</b>	<b>100%</b>

- 32 Farmers who consider themselves likely to cause environmental damage may spend time familiarising themselves with the new rules. It is unlikely that the Regulations by themselves will incentivise major operational changes but will act as a driver amongst others for new measures. Farmers may be subject to more uncertainty than other types of business as their operations are often conducted under conditions beyond their control (open to the elements and vulnerable to animal behaviour) and exposed to public scrutiny. The estimated costs to the farming sector represents an overall increase in farmers' production costs of around 0.01% of the total production costs of the sector and or 3% of the average turnover of a small farmer who actually bears the costs of remediation. The costs of a major case of environmental damage could exceed a farmer's assets rendering them bankrupt but such cases are likely to happen on average less than once a year.
- 33 Businesses in the **water sector** are estimated to incur about 12% of the costs to operators. Failure of sewage treatment infrastructure causing water damage is responsible for a large proportion of the estimate. To eliminate the risks of causing these types of damage would require investment of £billions but it is considered that the additional costs of remediation under the Regulations would not justify this level of investment.
- 34 It is also estimated that businesses in the **waste sector** will incur 17% of costs. Additional costs of remediation will largely fall on irresponsible waste operators rather than those who comply with existing regulations. It is assumed that it is unlikely that the waste sector will take significant measures in response to the new rules. This is because the majority of

waste businesses already control their risks to the environment adequately and those that do not are considered unlikely to do so as a result of the Regulations.

- 35 **Manufacturing** businesses will incur an estimated 11% of costs. The type of damage caught by the Regulations could occur through slow leaks from infrastructure, systems failures and major accidents. Generally operators and their representatives stated that they would not take action as a direct result of the new rules but the Regulations may act with other drivers to encourage changes.
- 36 **Land transport** operators (largely road) are likely to account for around 4% of costs. Road traffic accidents and leakages associated with transport depots and other facilities are capable of causing land and water damage under the Regulations. Given the number of operators and low probability that any one will cause damage, the Regulations are unlikely to lead to significant operational changes in this sector.
- 37 It is estimated that **fisheries** could incur an estimated 2% of costs. This includes mariculture and damage caused by bottom trawling around sensitive marine habitats where not compliance with legislation.
- 38 Businesses in the **construction** sector are likely to incur a small proportion of costs relating, for example, to release of substances into watercourses, movement of contaminated soils, development outside protected sites and major damage to bat roosts. Businesses in the **energy** sector may also face costs from accidents at sites, if rarely, and damage to estuarine biodiversity from water abstraction. The **retail fuel** sector is also likely to be affected as a result of more cases coming to attention where leaks pose health risks.

**Enforcement costs**

- 39 There will be several authorities across England, Northern Ireland and Wales responsible for enforcing and administering the new provisions. Estimates of additional costs have been made with information from the authorities that are currently responsible for parallel existing regimes where they exist. Table 8 summarises these estimates.

**Table 8: Additional costs of enforcing the Regulations**

	Costs £ms		
	Initial <sup>12</sup> pa	Final <sup>13</sup> pa	Set-up
England	1.1	0.5	0.8
Northern Ireland	0.2	0.1	0.1
Wales	0.2	0.1	0.1
<b>UK total</b>	<b>1.4</b>	<b>0.7</b>	<b>1.1</b>

- 40 There will be some costs associated with setting up the appropriate systems and procedures and training staff in each of the relevant authorities. There will also be ongoing costs that authorities, initially, will bear. The competent authorities will be able to recover some or all of these costs from operators giving a reduced final cost above. However, the amount authorities will be able to recover in a year depends on what incidents occur in a particular year and what remedial measures take place, whether amounts are disputed and when costs are recovered. Ongoing costs include:
  - i) costs associated with investigating damage
  - ii) assessing damage and remedial measures

<sup>12</sup> Before cost recovery

<sup>13</sup> After cost recovery

- iii) enforcing requirements and works
- iv) policy advice
- v) internal liaison
- vi) liaison with other authorities
- vii) legal and economic advice
- viii) monitoring and reporting to national government and EU

**Administrative costs vs policy costs**

41 ‘Policy costs’ are the essential costs of meeting the policy objectives whereas ‘administrative costs’ are those associated with the form that the policy measures take. The purpose of identifying policy and administrative costs separately is to examine whether there is a more efficient way of meeting the policy objective. While in the case of a European Directive there is limited scope for amending the policy, identifying administrative costs separately may highlight potential administrative savings. The policy costs (including those associated with measures to reduce or eliminate damage to the environment) represent the majority of the costs incurred in implementing the Regulations.

42 In the context of the Regulations it is assumed that ‘**administrative costs**’ include costs associated with:

- i) **Operators familiarising themselves with the new provisions.** Many businesses will take time to familiarise themselves with the new rules so that they know whether they are likely to cause relevant damage and what the requirements are in the event of damage. This activity which will take place mainly when the Regulations come into law has a cost associated with it. An estimate is made of **£4m** based on assumptions about the resource input of businesses in different sectors, including that the more risky sectors would be more likely to spend more time. It is also assumed, for example, that smaller businesses may spend about an hour of someone’s time perhaps in absorbing summary information provided by trade associations and other representative organisations. Larger businesses may take a ‘man month’, including communicating to other staff. There is likely to be considerable variation both between and within sectors. SMEs may be less able to afford time for familiarisation. Some time will be spent recurrently in refamiliarising with the rules and by new businesses – it is assumed that this might be 20% of first year costs.
- ii) **Where damage has occurred, any interaction between operators and enforcement authorities until remedial work starts.**
- iii) **Determining whether damage meets the threshold in the Regulations.**
- iv) **Costs incurred by competent authorities whether recovered from operators or not.**

‘**Administrative burdens**’ is that subset of administrative costs falling to private enterprises.

43 ‘**Policy costs**’ include those associated with:

- v) **Developing plans for and undertaking remedial measures**
- vi) **Any anticipatory measures businesses take**

44 Table 8 provides a summary of policy costs and administrative costs.

**Table 9: Policy vs Admin costs**

Recurrent	Admin cost	2.1
	Admin burden	1.4

	Policy cost	13.1
Set up costs	Admin cost	4.1
	Admin burden	3.0

### *Consistency with Hampton principles*

- 45 The Regulations are consistent with the recommendations of the Hampton report. In particular:
- The Regulations only require action and costs to be borne by businesses when there is an imminent threat or actual significant damage. It is therefore intentionally a risk-based policy instrument. It will not introduce any new forms for businesses to fill in routinely or databases that businesses have to service.
  - Where remediation is required, there are mechanisms within the Regulations to ensure that these take account of costs, benefits and are proportionate. For example, authorities are required to take account of the costs of options in evaluating options.
  - There is a requirement to provide a report to the European Commission by April 2013 on experience gained in the application of the directive for evaluation purposes.
  - The Government has been guided by considerations of customer experience in developing arrangements for authorities to enforce the provisions.
  - In terms of penalties, liability in the directive is directly related to the extent of damage that occurs. Penalties will be necessary where businesses do not comply with requirements to undertake remedial measures and it is expected that existing arrangements will be adopted for this.
  - Candidate competent authorities have been part of the implementation team since 2002. A standing group of technical experts from businesses is also used to explore and identify the practical implications of implementing the ELD provisions.
  - Representative bodies have been invited to business workshops to help inform the impact assessment, development of policy and operational guidance. Defra also undertook a series of regional workshops for individual companies while consulting on options for implementation.

### *Offsetting measures*

- 46 This refers to a Government commitment to offset administrative burdens introduced by new measures. Defra's simplification plan requires that Defra reduces the administrative burden that the Regulations for which it is responsible impose on businesses by 25% from 2005 levels by 2010. Currently Defra is on target to meet this reduction taking account of measures that are in the pipeline that are assessed to impose additional burdens including these regulations.

### **Indirect costs and benefits**

#### *Economic benefits*

#### Business opportunities

- 47 A large proportion of the costs identified in this assessment will in turn be revenue for the **environmental industry**. Where companies choose to undertake increased risk assessment and reduction or where they are required to undertake increased remedial measures, a high proportion of the cost will relate to staff time but they may need to buy software or equipment or may seek professional help. To the extent that companies take out insurance products there will also be increased revenue to the **insurance industry**.

- 48 There is unlikely to be a net gain to the economy associated with these new revenue streams as they would displace expenditure elsewhere in the economy. These expenditures are transfer payments from one sector to another. If there are external benefits in terms of technological development, then these could be considered as economic benefits of the Regulations but to the extent that this effect exists it is not quantified in this assessment.

### *Economic costs*

#### Anticipatory action

- 49 There are unlikely to be any significant 'second round' effects associated with anticipatory action taken to reduce operational risk. The possibility that companies would either choose not to locate in the UK or re-locate as a result of the Regulations was considered but appears very unlikely given the assessment that businesses might take limited anticipatory action as a result of the Regulations. The general expectation amongst businesses was that operators already pay when they cause environmental damage in the UK; given the limited application and additions that the minimum transposition of the Regulations introduces it is unlikely to alter the perception of rules for environmental damage significantly.
- 50 It was also considered unlikely that the costs of anticipatory action would lead to significant second round price increases because the costs are relatively small. For example, the estimated costs of measures taken by the water sector are £1.2m which is less than 0.02% of the turnover of that sector. If these costs were to be passed on to customers it would lead to a price increase of around 6p a year on average per customer<sup>14</sup>.

#### Remedial action

- 51 The possibility of second round effects associated with costs incurred following incidents was also considered. In isolated cases it is possible that the additional remedial costs of the Regulations will make the difference between a business closing down or not. In the event that a business does close down there may be knock-on effects, for example in terms of redundancies but normally people would find jobs elsewhere in the economy.
- 52 Most small businesses likely to cause damage would have assets in excess of the remedial costs in most of the cases. An assumption is that the additional costs will lead to a small business (e.g. a tenant farmer) closing down less than once each year on average<sup>15</sup>.
- 53 The impacts of a major business closing down in an isolated or depressed area would be more significant. There is no upper limit on the costs of remedial work under the Regulations: in general the greater the environmental loss, the more remedial measures will be required. This IA suggests that there might be an incident where the costs of damage exceed £1m every three to four years on average. It is not impossible that this level of increased costs could cause a large operation that is located in an area where there is not alternative employment easily accessible to close. In this event there would be further impacts on the local area to take into account. However, this potentially rare occurrence of such businesses closing down owing to the Regulations is not assessed for wider economic and social impacts.

### *Effects of the permit defence*

---

<sup>14</sup> On the basis of total additional costs divided by number of households in England, Northern Ireland and Wales.

<sup>15</sup> On the basis of consideration of the frequency of cases under the regulations, the additional costs, the distribution of incidents between SME and large businesses and the market structure of the sectors that most often cause damage

- 54 The Regulations allow for a permit defence for operators. The implications of having the permit defence in terms of its effect on the level of damage covered and on the extent to which operators take anticipatory measures is bundled up in the total estimates of costs and benefits. There may, however, be wider effects of having a permit defence that should also be noted:
- i) Permitting authorities may respond to the permit defence by tightening permit conditions. If this happens it could increase costs of permit compliance by many £millions. In most cases compliance conditions are already set at high levels.
  - ii) Operators may invest more time in the development of permit conditions to ensure that all their activities are 'expressly authorised' so they fall within the terms of the permit defence. This is likely to be limited to a few of the very large operators if it occurs.
  - iii) A permit defence may make insurers more willing to offer products.
  - iv) The inclusion of a permit defence may increase the risk of litigation but alternatively it may give operators a measure of certainty.
  - v) In Wales the lack of permit and state of knowledge defences in respect of GMOs means that businesses may choose to take more anticipatory actions.

### *Distribution of impacts*

- 55 Some geographical variation can be expected in terms of where the costs and benefits of the Regulations fall given the types of event that trigger the Regulations. The Regulations cover damage to important biodiversity and so businesses that operate in sensitive areas will run increased risks of causing damage during the lifetime of their operations. Likewise for water damage those operating around rivers with sensitive ecology or which are sensitive to contamination or around major aquifers will run increased risks of causing damage. Land damage is caused when there are human health effects so those operating in densely populated areas or, for example, in the vicinity of playgrounds (where children may be more sensitive to exposure to contamination), may also run increased risks of causing damage.

## **Costs and benefits through time and in context**

### Costs and benefits through time

- 56 The assessment so far has concentrated largely on the expected costs and benefits of operators' response to the Regulations, and those associated with incidents that occur in the first year that the Regulations are in force<sup>16</sup>. This section now considers the costs and benefits of incidents occurring in the first ten years after the introduction of the Regulations. As for the first year this takes account of the costs and benefits of operator's response and of measures associated with incidents in each of the first ten years irrespective of when the benefits actually accrue.
- 57 A few assumptions have to be made to estimate costs and benefits over ten years. They are:
- i) **Set-up costs** for enforcement authorities are assumed to be one-off costs in the first year of operation.
  - ii) **Familiarisation** is assumed to take place largely in the first year. Re-familiarisation and new entrants are assumed to lead to 15% of first year costs recurrently.
  - iii) **Anticipatory actions** are assumed to be taken largely in the first two years in the wake of publicity surrounding the introduction of the new measures, with 20% of year 1 and 2 costs recurrently. Publicity surrounding major incidents may encourage other businesses to take measures at any time.

---

<sup>16</sup> Even though an incident occurs in Year 1, the benefits of measures taken may accrue and costs may be incurred over several years.



iv) **The level of damage** is assumed to remain constant through time. This is a simplifying assumption as a large number of the factors that determine how much damage will occur are expected to reduce the level of damage. These include: regulation, more risk-based enforcement, improved technology and action taken to reduce risk as a result of the Regulations. Climate change is one factor that may significantly increase the level of damage. It should also be noted that irrespective of how much damage occurs, the impact of the Regulations will depend on how much of damage that occurs comes to attention; a number of factors may increase this such as increased monitoring, increased rights to roam for the public, proliferation of mobile phones and increased rights for the public brought in by the Aarhus Convention.

58 Taking account of these assumptions and using a discount rate of 3.5%, the (best estimate) present value of the additional costs of the Regulations over 10 years are estimated to be about £94m and the present value of benefits is estimated to be in excess of £121m (in 2005 £s).

#### Costs in context

59 Table 10 puts the estimated additional costs of the Regulations in the context of annual turnover of broad sectors and for those individual businesses subject to requirements in the context of the average turnover of, first, a small business and, second, a large business. The second column shows the total estimated costs of the Regulations for each sector as a percentage of the overall sector turnover. The third column shows how the additional remedial costs for one incident of damage might relate to the turnover of a small business in each sector.

**Table 10: Sectoral turnover in context**

<b>Sector</b>	<b>Costs as % of sector turnover</b>	<b>Additional remedial costs<sup>17</sup> as % of turnover of a small business<sup>18</sup></b>	<b>Additional remedial costs as % of turnover of a large business</b>
Agriculture	0.02%	17%	0.4%
Manufacturing	0.0004%	9%	0.7%
Waste	0.03%	11%	1.0%
Water	0.02%	NA	0.03%
Transport	0.001%	6%	1.7%
Other industry	0.0002%	5%	0.3%
Other	0.0002%	10%	NA

60 The total estimated costs to operators associated with the Regulations (£15m ongoing costs in the first year) would increase the current expenditure by industry on environmental protection<sup>19</sup> by 0.4%.

#### Sensitivity analysis

61 Sensitivity analysis is undertaken to test how sensitive the results are to the key assumptions made in the assessment. The analysis which is presented in Annex 6 concludes that the results of the analysis are most sensitive to the following assumptions:

<sup>17</sup> £100,000 is taken as a proxy for the additional costs of remediation

<sup>18</sup> The average turnover of firms employing 10-19 people is used as a proxy for the turnover of small firms in each sector.

<sup>19</sup> £3.4bn as estimated in Environmental Protection Expenditure by industry: 2003 UK survey. Defra 2005.

- The number of marine cases
- The number of cases of marine damage
- The number of severe water and biodiversity cases
- The number of land cases
- Benefits of estimate of remediation of land damage
- The level of anticipatory action taken

### **Risks and unintended consequences**

62 The following potential risks have been identified:

- Litigation
- Challenge to establish the Regulations apply
- Assessment costs may be high
- Challenge for businesses to understand additional liability
- Spurious requests for action
- Shortage of remediation projects
- Determining when damage occurred

More detail is provided in Annex G of the first consultation RIA.

## Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

**Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.**

Type of testing undertaken	<i>Results in evidence base?</i>	<i>Results in annex 5?</i>
Competition Assessment	No	Yes
Small Firms Impact Test	No	Yes
Legal Aid	No	Yes
Sustainable Development	No	No
Carbon Assessment	No	No
Other Environment	No	Yes
Health Impact Assessment	No	Yes
Race Equality	No	Yes
Disability Equality	No	No
Gender Equality	No	No
Human Rights	No	No
Rural Proofing	No	No

## Annex 1: Approach to assessment

- 1 The precise impact of the Regulations will depend on several factors, including:
  - The number of cases of qualifying damage that take place in the future
  - The extent and nature of damage caused in the future
  - The additional measures that operators and authorities decide should be taken, their costs and the benefits that result from them
  - The anticipatory measures that operators decide to take in response to changes in liability rules
- 2 These factors are inherently uncertain and cannot be predicted confidently. The approach to the assessment has been to use available methods and data to be able to characterise as accurately as possible the likely impact of the Regulations. It is nevertheless important to underline that there is significant uncertainty in providing central estimates. Ranges are therefore provided where possible and sensitivity analysis has been undertaken to test the sensitivity of estimates to the key assumptions made.
- 3 The first step of the assessment was to estimate the likely numbers of different types of cases of damage that will be caught by the Regulations and to establish the additional (primary, complementary and compensatory) measures required in response. This is done by reference to samples of past records on environmental damage held by enforcement authorities across England, Northern Ireland and Wales. The samples were examined to see what cases would have been covered had the Regulations been in force and consideration was given to whether there was reason to think the level of damage or the level that comes to attention for action under the Regulations would change.
- 4 Experts from enforcement authorities were asked whether the samples were representative of an average year. Estimates were adjusted where there was reason to believe that the sample was unlikely to represent the future. Based on expert advice, in addition to the types of cases that arise year after year there is occasionally a more severe case of damage. Authorities identified the more severe cases that have occurred in the past and have characterised the types of such cases that might occur in the future. This is necessarily based largely on judgement.<sup>20</sup>
- 5 The additional measures that would have been required for each case caught were then identified replicating the approach required in the Regulations as closely as possible and the costs of those measures assessed. Data for the cost assessment was provided by the Environment Agency (“EA”) and Natural England (“NE”) based on the costs of similar types of damage being remediated using a unit cost for the variable element of cost. The administration and assessment costs are identified separately. The potential additional costs of addressing the more severe cases of damage under the Regulations were considered. A proportion of these costs was factored into the estimates of total annual costs.<sup>21</sup> These annual estimates were then apportioned between business sectors by reference to larger samples of summary data than the sample of data examined in detail. These sectoral cost estimates are presented in order to give a general feel for how costs are distributed but it is uncertain how the future will relate to the past and how costs to different businesses will be spread.<sup>22</sup>

<sup>20</sup> Annex B from page 73 of the first consultation RIA provides detailed information on how the level of damage was assessed.

<sup>21</sup> As above Annex C has information on the assessment of costs and benefits of remedial measures from p99.

<sup>22</sup> As above Annex D has information on how costs are assessed to fall by sector from p137

- 6 The value of the environmental benefits of the identified measures was then assessed. This was done by identifying what environmental improvements would have resulted from the measures and then estimating the value to society of those improvements. The approach to monetary valuation was 'benefits transfer'. This technique involves examining existing studies that value the benefits of similar or closely related environmental improvements and transferring the value from the study to the policy scenario taking account of some important identifiable differences. The studies on which this assessment draws value environmental benefits by estimating individuals' 'willingness to pay' for the provision of those benefits normally through interviews.
- 7 The assessment identifies studies that value improvements as similar as possible to those that would be required in response to the damage. It then transfers a per unit (e.g. per hectare) value to estimate the value of the improvement resulting from measures under these regulations. Where the study site and site subject to the Regulations are not in the same UK region adjustments are made for differences in income and in population between the regions. Other differences that might affect the values are considered but adjustments are not made for them. Best estimates and a range are provided on this basis representing the benefits achieved as a result of additional measures taken under the Regulations. Sensitivity analysis is undertaken (see annex) to assess the effect on the overall conclusions of using the lowest and highest central values<sup>23</sup> for the benefits. In this case it is therefore possible that the extreme high or low values could be outside the values presented.
- 8 Relying on a sample of past cases to estimate costs and benefits means that some types of improvement (for example work to certain types of habitat) that may be required in response to environmental damage in the future may not be represented in the analysis. For damage to species and habitats where there are many different types of habitats and species covered by the Regulations the assessment reviews studies that assess the costs and benefits of the range of types of improvement to habitats and species that may be required to see whether the findings point in the same direction.<sup>24</sup>
- 9 It is important to note that the accuracy of the estimates of future damage presented is limited by the extent to which future damage will mirror past damage as reconstructed through records and the judgement of relevant experts. Ultimately it is not possible to predict with certainty what environmental damage will happen in the future and what the response to it will be. The core analysis is undertaken on the basis of the 'best' estimate of the level of damage but sensitivity analysis (see annex) is undertaken examining the effect on the overall conclusions of lower and higher levels of damage informed by advice from EA, NE and Local Authorities.<sup>25</sup>
- 10 In order to assess the cost of anticipatory actions that operators decide to take in response to the new provisions, focus groups were set up each dedicated to a sector that has been responsible for the relevant type of incidents in the past with a range of different businesses within the sector. Businesses were asked what additional action they were likely to take as a result of the Regulations and at what cost. Extrapolation was undertaken on the basis of this information to derive total costs across all sectors. These initial estimates were cross-checked by putting them back to trade associations most of whom tested them on some of their members. The accuracy of these estimates will depend on a number of factors such as whether the actions that businesses will actually take reflect what they predicted, current understanding of the future implications of the Regulations,

---

<sup>23</sup> When undertaking benefits transfer there were sometimes more than one appropriate study from which to transfer values. The 'best' estimate is based on the average of all the 'central' values from the studies. The sensitivity analysis is based on a) taking all the central values from the studies with the lowest values and the central values from the studies with the highest values.

<sup>24</sup> As above Annex C has information on the assessment of costs and benefits of remedial measures from p99.

<sup>25</sup> More detailed sensitivity analysis is also provided in Annex F of the RIA.

and how representative samples used are. Sensitivity analysis is used to test the effects on the overall conclusions of the assumptions used and businesses and their representatives are asked for further information to improve the estimates.

- 11 Actions that operators take in response to changes in liability are likely to lead to reduced exposure to liability and therefore to a reduction in damage taking place, although not all actions, for example taking out insurance, will lead directly to reductions in the risk of damage taking place. Assumptions are made to assess the benefits associated with this.<sup>26</sup>
- 12 The costs to authorities were then estimated with existing authorities on the basis of the estimated flow of cases. The Regulations provide that costs associated with cases where operators undertake work can be recovered. However, these estimates assume that there will be some costs that are not recoverable, for example in having the systems in place to respond to cases (irrespective of whether they happen), costs of liaison with other authorities and costs of investigating cases that turn out not to need work.
- 13 A similar approach to estimating costs and benefits was used for assessing all the options: the sample of past cases is revisited to see whether cases covered change or whether the response to particular cases change. Views were also sought from authorities and businesses on the effect of each option. Options other than the position reflected in the final regulations are not, however, reflected in the final IA.
- 14 In providing cost-benefit analysis over the assessment period the starting assumption is that the numbers of cases of environmental damage remains constant. It is suggested that this is a cautious assumption as there are a number of factors that are likely to affect the level of damage and most of the main ones are likely to reduce damage such as higher regulatory standards, improved technology and the effect of measures operators choose to take consequent to the introduction of the Regulations. These would be offset by other factors that may increase the level of damage (that comes to attention) such as improved technologies for detecting damage or increase environmental monitoring. How the various factors might impact on different business sectors is considered and the effect of potential reductions or increases in damage over time on the overall conclusions is tested.
- 15 Administrative burdens are assessed separately from policy costs throughout.

---

<sup>26</sup> Annex E of the RIA provides more detail on the assessment of anticipatory measures.



## Annex 2: Approach to assessing remedial measures for damage to species and habitats

### Sources

- 1 There is no single or centralised recording system for damage to species and habitats in England, Northern Ireland, Scotland or Wales. It has therefore been necessary to draw on a number of sources to estimate the number of cases falling under the Regulations. For terrestrial species and habitats these include records held by NE, Scottish Natural Heritage (“SNH”) and the Countryside Council for Wales (“CCW”), by Non Governmental Organisations, reports on habitats and species under the European directives, records on wildlife crime, and information from the Habitats Review of Consents in England and Wales.<sup>27</sup> The assessment for marine species and habitats was undertaken with key marine conservation experts. The assessment was originally UK-wide but this IA relates only to England, Northern Ireland and Wales and the estimates for Scotland are therefore excluded in reporting conclusions.

### Estimated number of cases

- 2 On the basis of the data referred to above and the views of conservation experts in NE, SNH, CCW and Defra, a best estimate is provided of:
  - i) *7 cases each year in England, Wales and Northern Ireland that affect the integrity of SSSIs (in relation to the species and habitats on any of the citations for the sites) of which 1 may also affect the conservation status of species or habitats*
  - ii) *1 case each year outside sites affecting the conservation status of species or habitats*
- 3 These estimates are higher than the actual number of cases that national agency experts could identify over a period of time. This best estimate is therefore cautious; and, in relation to damage outside sites takes account of the possibilities that authorities may not currently know of all cases.
- 4 A separate group of experts with marine responsibilities<sup>28</sup> estimated that there might on average be **one case every three years of damage in the marine environment** that comes to attention. The general view was that there were few activities which could cause damage that is significant at a species or habitat level in the marine environment where the cause can be traced to one or more identifiable operators. These might include mariculture, dredging and dumping, engineering operators and, where legislation has not been complied with, fishing with bottom gear.
- 5 No cases of imminent threats could be identified where more would have been required under the Regulations than at present. Where there are imminent threats of damage to species and habitats as defined in the Regulations there is generally existing legislation in place to prevent it. It is therefore suggested that it is unlikely that additional preventive measures would be required as a result of the Regulations. It is possible that the provision for preventing environmental damage may ‘bite’ more rapidly in some cases than existing provisions. For example, where currently procedures under SSSI management agreements or in the planning system would be pursued, the Regulations are likely to require more rapid action.

### Additional costs

- 6 In order to assess remediation costs, cases of damage to species and habitats were categorised in four groups: i) cases where there is an effect on the integrity of SSSIs, ii) cases where there is an effect on the conservation status of terrestrial species and

<sup>27</sup> Estimates for Northern Ireland have been made on the basis of data for Scotland, Wales and England.

<sup>28</sup> From NE, Cefas, Defra and the Joint Nature Conservation Committee (“JNCC”).

habitats iii) cases where there is an effect on the conservation status of marine species and habitats iv) severe cases of the type that might only occur on average once in five years<sup>29</sup>. Given that the estimated numbers of those cases where there are effects on conservation status and of the severe cases are higher than the actual number of cases that were identified, information is used from cases that fell below the threshold with upward adjustments to characterise cases for the purposes of the assessment of costs and benefits. The approach was to identify what remedial measures would have been required following the Regulations as closely as feasible, and to estimate the costs of implementing the measures. In total fourteen case examples were used as the basis for the assessment of these costs.

- 7 The average cost for SSSI cases was £22,000. Given the cases considered and expert views of NE and SNH the average cost of these cases is unlikely to fall outside the range £10,000 to £60,000. The costs of a 'conservation status' case could range from a few thousand pounds to several hundred thousands of pounds. However, based on the types of cases identified and the costs of work associated with them, the average cost of these cases appears unlikely to fall outside the range £25,000 to £400,000 and a best estimate of £100,000 is provided. Likewise it is suggested that the average cost of a marine case might range from £100,000 to £2m with a best estimate of £800,000. The level of remediation and costs are not limited in regulations and the cost of severe cases might run from over £1m to many millions of pounds. Very few cases potentially falling in this bracket can be identified in living memory. It is suggested on the basis of available information that the average cost of a 'once in five years' case might range from £1m to £10m with a best estimate of £5m.
- 8 As well as the remedial work itself operators will also face costs associated with assessing the damage in line with Schedule 3 of the Regulations and the authority will recover their costs associated with the case from the operator.

#### Additional benefits

- 9 The assessment of the benefits to society that accrue from additional remedial measures taken<sup>30</sup> is made on the basis of the same set of remedial measures identified for the assessment of costs. The improvements associated with measures were identified and the value to society of improvements was estimated by transferring values from past studies that value similar ecological resources. The assessment of benefits is made on the basis of twelve terrestrial cases of damage to species and habitats and one marine case.

#### Review of studies that assess the range of species and habitats work

- 10 Given the past sample of damage may provide a limited range of cases, studies assessing the costs and benefits of the range of work to improve protected habitats and species are reviewed. This is to cross-check the estimates provided by directly transferring values for the cases within the sample. This is done in case past cases of damage do not provide a good guide for future cases of damage. In some of these studies the value of the benefits outweighs the remediation costs by factors of 1.8 to 133. The following should be noted:
  - This does not demonstrate that benefits will always outweigh costs but suggests a tendency.
  - It has been suggested that the available studies may be biased towards valuing 'higher value' work that may be undertaken under the Regulations

---

<sup>29</sup> 'Once in 5 years' cases may be better considered over a longer period of time so, for example, over 50 years the average cost of the ten most serious cases are considered separately from the remaining cases.

<sup>30</sup> These measures are generally concerned with enhancing, protecting, conserving and creating features for biodiversity.

- Studies may not be representative if in some cases they tend to value visibly 'high value' work.
- Conversely, some studies may sometimes be carried out where the level of benefits may previously have been considered marginal.
- Flexibility under the Regulations may lead to a tendency for operators to find higher value work.

## Annex 3: Approach to assessing remedial measures for water damage

### Sources

- 1 The assessment is based on information from incident reporting databases, information on failures of standards under EU directives and on expert advice. Detailed information was available from the EA and from the Scottish Environment Protection Agency (“SEPA”). The estimates for Northern Ireland are made by comparison to England, Wales and Scotland on the basis of judgement taking account of the relative geographical extent, population and industry make-up.

### Estimated number of cases

- 2 Three cases of qualifying damage were identified by EA from records covering England and Wales. It is estimated that there might on average be **five cases of water damage each year in England, Wales and Northern Ireland**. In all the cases of imminent threat identified no further action would have been required under the Regulations and it is assumed that this will generally be the case.

### Additional costs

- 3 Detailed examination of cases provides the basis for the assessment of costs and benefits of remedial measures in response to water damage. The additional work required is assessed in terms of the additional length of river requiring a particular level of improvement. Indicative costs are estimated on the basis of data for the average cost of improvements to particular standards per km across England and Wales. Taking an average value across seven case studies provides a cost estimate of £105,000 per case which is extrapolated to cover the estimated five cases. Taking account of factors that might increase or decrease costs for types of ‘regular’ cases covered it is suggested that the average cost is unlikely to fall outside the range £25,000 to £500,000. The costs of assessing and administering damage are identified separately. The estimation of variable costs is linear, so that remedying ten kilometres of river costs ten times the remediation of one kilometre of river. A fixed element of costs has also been used in the assessment. Potential differences in the characteristics of the water bodies and in the nature of damage have not been taken account of except in the sensitivity section.

### Additional benefits

- 4 Benefits assessment work undertaken for the Periodic Review of water prices provides a per km estimate across England and Wales of the benefits of river improvements to specified standards. These values are applied to the improvements required in the seven case studies and extrapolated to cover five cases.

## Annex 4: Approach to assessing remedial measures for land damage

### Sources

- 1 No records on cases of land contamination are held centrally and so a number of sources have been used to inform the assessment. These include: EA's incident reporting database for England and Wales, records in England relating to Part IIA, views of local authority contaminated land officers in England and information from the Health Protection Agency.

### Additional cases addressed

- 2 Around 250 cases of category 1 and category 2<sup>31</sup> cases of land contamination are reported to EA each year. These may be addressed under a variety of regimes, for example EPP. A proportion of these would fall within scope of the Regulations but others would not, for example, because they are not serious enough or because they affect receptors not covered by the Regulations.
- 3 Around one case every two years of 'newly caused' damage has been 'determined' under Part IIA and one such case every year has fallen under Defra's Capital Projects Programme. Information provided by Local Authority contaminated land officers suggested that many other cases of new undefined contamination may arise each year additional to those determined. Some of these may be within the scope of existing regimes and eventually within the scope of the Regulations but could be addressed for example through the planning system or through insurance policies or they may not be reported at all.
- 4 Potential types of damage from organisms and micro-organisms were identified with the assistance of the Health Protection Agency and their frequency considered. This suggested that there may be a handful of waste-related cases each year that may be addressed under existing waste regulations and much rarer cases relating for example to the introduction of plants or epidemic diseases.
- 5 The evidence suggests that not more than 300 cases of land damage within the Regulations' scope are addressed through the liability provisions in environmental legislation each year in the UK. Given the existing frameworks and the apparently relatively minor additions of the Regulations, it is assumed that it is unlikely that it will increase the numbers of cases addressed through liability provisions by more than 50% and it may be that it only leads to additional cases very rarely. A speculative estimate is made that the Regulations may lead to an increase of 20% over the 300 cases referred to above, i.e. to a further 60 cases of land damage on average each year in the UK or to approximately 48 in England, Northern Ireland and Wales alone. One major consideration is that if people are aware that significant risks to their health exist, it is reasonable to suggest that they will already take steps to ensure action is taken.
- 6 Further conclusions of the assessment include that:
  - i) It appears unlikely that the Regulations will lead to more preventive measures than are currently undertaken under existing arrangements
  - ii) The Regulations may lead to measures being taken more rapidly – any costs and benefits of this effect are not assessed
  - iii) Some cases where damage was addressed in the absence of the Regulations without authorities knowing may now be notified to authorities – no attempt has been made to quantify numbers of cases.

### Additional costs

---

<sup>31</sup> These are categories under the Common Incident Classification Scheme (CICS) which classes incidents from Category 1 to 4 according to severity (category 1 is the most severe).

- 7 The notion that additional action will be undertaken is based on the presumption that there are cases that do not already come to attention. While cases of qualifying land damage have been identified, the Regulations would not have required further action for them but they are used as a guide for estimating costs and benefits for cases that might be subject to further action under the Regulations. Unlike for water damage and damage to species and habitats it is suggested that there will not be action required in relation to 'severe' cases as where these occur they should already have come to attention under existing regimes with the possible exception of cases of contamination caused by organisms and micro-organisms.
- 8 In order to assess the costs and benefits of the estimated additional forty-eight cases, six 'new' cases that were addressed under existing arrangements were used as the basis for case studies. A per case cost of £52,000 is derived from the sample cases. The sample may not be reflective of any additional cases that are addressed under the Regulations both because it is a small sample and because the cases that were addressed under existing regimes may not necessarily represent cases that additionally come to attention. This estimate is therefore cross-checked with information from EA about the average size of area affected by cases of new land contamination from recent records and information on the unit costs of land remediation which suggest a similar level of costs.
- 9 The above costs relate to cases where additional remedial measures are taken and are costs incurred by the operators responsible. Some costs may also be transferred to the extent that authorities incur costs associated with investigating and assessing cases (that are addressed under existing arrangements) and under the Regulations operators will be responsible for them. The potential size of this transfer has not yet been assessed.

#### Additional benefits

- 10 The benefits to society are assessed by identifying the outcomes of remedial measures for the six case studies and estimating the value of them. These values are then extrapolated to cover the 48 cases.
- 11 In five of the six cases examined the risks were mitigated by taking the affected area or facility out of use. The main disbenefit, therefore that remediation would correct is the loss of the land or facility until brought back into use. These benefits can be estimated by using market values for the loss. The remaining benefits of remedying damage which largely relate to reduced health risks are harder to estimate owing to limitations in the data and methodologies linking contaminant concentrations and health risks.
- 12 It is difficult to predict the nature of any cases that may additionally be addressed once the Regulations are in force because the only available reference cases are those that do come to attention. It is possible that it will be the cases with less defined benefits that fall to the Regulations as existing arrangements would pick up the cases where measures are most 'needed'. For this reason estimates of the benefits are deflated by 50% and the effect of using different deflators is tested.



## **Annex 5: Specific Impact Tests**

### *Health benefits*

- 1 There are likely to be health benefits associated both with voluntary actions taken by businesses to reduce environmental risks and with measures required following incidents particularly in the context of land damage and water damage. There are the direct benefits to the public of reduced illnesses and adverse conditions and indirect benefits in terms of reduced stress (worrying about one's own or others' conditions) and reduced time off work, which in turn has a positive effect on the economy. Additionally, fewer environmental damage related health effects will reduce the burden on public health services. The direct benefits may be captured in the quantified estimates of benefits but the indirect benefits may not be.

### *Race equality*

- 2 It is a statutory requirement to consider the impacts of a policy on race equality. An initial screen was undertaken of the Regulations' provisions' effects on race equality and none was identified.

### *Environmental/ Improved local environmental quality*

- 3 There are direct environmental benefits associated with both voluntary action and additional remedial measures and these are reflected in the quantified estimates of benefits. It has been established that an improved environment may also have positive 'knock-on' effects in a local area even reducing crime in some cases. There may be such effects associated with the cases of land damage that this assessment suggests would not have been addressed in the absence of the Regulations.

### *Climate change impact assessment*

- 4 The potential impact of climate change was considered on the estimate of costs and benefits. The UK Climate Impacts Programme undertook a study in 2002 examining the effects of four different climate change scenarios up to the 2080s. Of the meteorological factors they looked at increased rainfall was the only one that is likely to have a significant impact on environmental damage; the worst-case scenario suggests that rainfall might increase by 15-35% by the 2080s. A sample of incidents was examined of which rain was a contributing factor to about 10% of them. It would not be unreasonable to suggest, given that operational systems are designed for particular levels of rainfall, that a 35% increase in rain could double the numbers of incidents caused by rain, increasing the numbers incidents caught by the Regulations by 10%. Another potential factor to bear in mind is the negative impact for example the carbon emissions generated as a result of any measures to reduce the risk of causing damage.

### *Competition Assessment*

- 5 This standard competition assessment test concludes that the Regulations may not have significant impacts on competition. The test is designed to consider internal UK competition rather than the effects of the policy on the competitiveness of UK businesses versus non-UK businesses. Given that all countries in the EU are required to transpose at least the minimum requirements of the Regulations then minimum transposition would not be expected to put UK businesses at a competitive disadvantage in relation to other EU businesses, although this general assumption does not take account of differences in the structure of the economy between different Member States.
- 6 Businesses that operate in non-EU countries will not be subject to the Regulations and may have lower levels of environmental liability, they may therefore operate with lower

risks of incurring costs for environmental damage. Whether or not the introduction of the Regulations in the UK will give those companies an advantage over companies located in the UK will depend largely on the increased risk for UK companies and on the potential for trade in the sectors in which they operate. The sectors that are at highest risk of increased costs are the agricultural sector, the waste sector and the water sector but the risks are still very low with the total cost of damage by sector representing 0.02% or less of turnover in each sector. The risks for manufacturing and other sectors that have a higher exposure to international competition are lower.

### *Small Firms Impact Test*

- 7 A full small firms impact test concludes that:
- i) As much damage under the Regulations is likely to be caused by small firms as large firms and that small businesses are capable of causing very significant incidents of damage.
  - ii) The costs of remedial measures will be larger relative to the turnover and profit margins of smaller companies than of larger companies. For example, £100,000 which is (roughly) the estimated average additional level of costs of water and species and habitats incidents represents two years of turnover for the average one-man farm and 0.03% of the turnover for the average chemicals manufacturer employing more than 500 people.
  - iii) Time invested in finding out about the new rules may be relatively more costly than needed for a larger company.
  - iv) Smaller companies may be less good at assessing risks than larger companies which may lead to lower levels of risk reduction than optimum.
  - v) There may be disadvantages for small firms if third parties over-estimate the impacts of the new provisions. For example, small firms may find it harder to secure finance or find it harder to win contract work.

### *Legal Aid test*

- 8 The Regulations are unlikely to have an impact on Legal Aid. In the unlikely event that there is any appreciable impact a net decrease is more likely as:
- i There are likely to be fewer prosecutions as a result of being able to require restoration in all cases without prosecution whereas prosecution is currently necessary to require restoration of biodiversity damage. A high proportion of current prosecutions for biodiversity damage involve farmers who may be eligible for legal aid.
  - ii It is conceivable that prosecution will be pursued where operators do not co-operate but this is likely to happen rarely and given the size of organisations causing damage will only very rarely involve those eligible for legal aid.

## Annex 6: Results of sensitivity analysis

(based on UK-wide impacts)

Assumption	Range			Sensitivity analysis			
	Low	Best estimate	High	Low		High	
				Cost	Benefit	Cost	Benefit
No. of SSSI cases pa	2	7.5	23	-2%	-3%	6%	12%
No. of FCS cases pa	0.1	2.5	12	-5%	-5%	17%	18%
No. marine cases pa	0.1	0.3	3	-2%	-2%	26%	24%
No. severe bio pa	0.02	0.20	0.5	-9%	-9%	16%	15%
Cost of SSSI case	10	22	60	-1%	0%	2%	0%
Cost of FCS case	25,000	100,000	400,000	-2%	0%	7%	1%
Cost of marine cases	100,000	800,000	2,000,000	-2%	0%	3%	0%
Cost of severe bio	1,000,000	5,000,000	10,000,000	-8%	-1%	9%	2%
Benefit of bio case	3.5	5.5	7.5	0%	-6%	0%	6%
No. of water cases	2	5	15	-5%	-5%	12%	12%
No. of severe water	0.01	0.1	0.5	-5%	-8%	20%	33%
Cost of water remediation per km	200	350	500	-2%	0%	2%	0%
Fixed cost of water remediation	10	50	75	-2%	0%	1%	0%
Benefits of water cases	2.4	4.0	5.5	0%	-5%	0%	5%
No. of land cases	<b>0</b>	<b>48</b>	<b>150</b>	-39%	-50%	59%	76%
Cost of land cases	20,000	52,000	100,000	-17%	-2%	25%	30%
Land benefits deflator	<b>-75%</b>	<b>-50%</b>	<b>50%</b>	0%	-20%	0%	94%
Assessment and admin costs	<b>25</b>	<b>100</b>	<b>400</b>	-12%	-1%	80%	11%
Cost of anticipatory action	<b>25%</b>	<b>100%</b>	<b>400%</b>	-21%	-16%	85%	65%