



Biennial report on reservoir safety
1 April 2013 - 31 December 2014

We are the Environment Agency. We protect and improve the environment and make it a better place for people and wildlife.

We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

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Foreword

We continue to see improved compliance with the Reservoirs Act 1975 in England.

The Reservoirs Act 1975 was amended by the commencement of Schedule 4 of the Flood and Water Management Act 2010 in July 2013, which introduced a more risk based approach to how we regulate reservoirs in England. It also introduced new responsibilities for the owners, operators and users of reservoirs who are collectively called reservoir undertakers. We are helping undertakers to understand these changes and what is required of them and by when through personal contact and providing clear advice and guidance

We will continue with our engagement work with reservoir undertakers as we have seen the positive impacts it is having on reservoir safety.

A handwritten signature in black ink, appearing to read 'A. Deakin', with a long horizontal line extending to the right.

Antony Deakin

Flood and Coastal Risk Manager – Reservoir Safety

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1. Our Role

The Environment Agency is the enforcement authority for the Reservoirs Act 1975 and an 'undertaker' (i.e. owner, operator or user) for 209 large raised reservoirs in England. This biennial report looks at the work that we have done to secure compliance with the requirements of the Act in England between 1 April 2013 and 31 December 2014.

In Section 4 we describe the work that we will be doing over the next two years.

Under the Reservoirs Act 1975 we:

- maintain a register of all reservoirs under the Reservoirs Act 1975 (the Act);
- make sure that undertakers appoint a construction engineer to design and supervise the construction or alteration of large raised reservoirs;
- designate reservoirs as 'high-risk', if we think that human life could be endangered in the event of an uncontrolled release of water from the reservoirs;
- encourage undertakers to comply with the Act by engaging with them at regular intervals;
- make sure that undertakers appoint a supervising engineer for their reservoirs;
- make sure that undertakers have their reservoirs inspected by inspecting engineers;
- make sure that undertakers carry out any necessary investigations, repairs, improvements or studies (i.e. 'measures to be taken in the interests of safety' (safety measures)) required by inspecting engineers;
- when necessary, appoint engineers and commission engineering work, including any necessary safety measures on their behalf, when an undertaker does not comply with the Act. We charge undertakers for this work;
- appoint engineers and take any other action necessary in an emergency, to make sure that safety measures are completed;
- make sure that undertakers report reservoir incidents and share lessons learnt from them;
- ensure that we observe and comply with the requirements of the Act for our own reservoirs.

2. Background

Although there have been no recent reservoir failures that have resulted in loss of life, it was the death of 21 people after the failure of two dams in 1925 that led to the passing of the Reservoir (Safety Provisions) Act 1930. This Act was updated by the Reservoirs Act 1975.

The Reservoirs Act 1975 introduced:

- the role of the supervising engineer;
- the role of the enforcement authority;
- the public register of reservoirs, which was to be kept up-to-date.

The Water Act 2003 transferred the responsibility for enforcing the Reservoirs Act 1975 in England and Wales to the Environment Agency. On 1 April 2013, Natural Resources Wales (NRW) became the enforcement authority for large raised reservoirs in Wales.

The Flood and Water Management Act 2010 (FWMA) makes further amendments to reservoir safety legislation. Phase one of these amendments was implemented on 30 July 2013 in England and introduced the following main changes:

- reservoir undertakers must register their large raised reservoirs with the Environment Agency;
- the Environment Agency must designate a large raised reservoir as high-risk if we consider that human life could be endangered in the event of an uncontrolled release of water;
- the inspection and supervision requirements of the Act will only apply to high-risk reservoirs;
- Inspecting Engineers' recommendations as to the maintenance of a high-risk reservoir are now legally enforceable;
- all engineers' reports and statements for designated high-risk reservoirs must be sent to us;
- incident reporting is now a legal requirement for all large raised reservoirs;
- offences under the Act are now primarily strict liability. This means that for an offence to be committed, the mere fact that the non-compliance occurred is sufficient, rather than there being a need to prove wilful default and no reasonable excuse.

3. Regulatory Position

Compared to the biennial report for the period ending 31 March 2013 the regulatory position is as follows:

- the number of reservoirs without a supervising engineer appointed has **decreased** from 12 to 8;
- the number of reservoirs with an inspection due and no inspecting engineer appointed has **increased** from 12 to 14;
- the number of reservoirs with an inspection overdue by more than a year without having an inspecting engineer appointed has remained at zero;
- the number of reservoirs with overdue safety measures has **decreased** from 51 to 40;
- we have received 4 full incident reports and 5 initial incident reports since incident reporting became a legal requirement in July 2013;
- we commenced the process of assessing whether all 2,001 large raised reservoirs in England were high-risk. Guidance for the owners, operators and users of reservoirs was published in August 2013 and by 31 December 2014 we had designated 112 reservoirs as not high-risk, reducing the amount of regulation at these sites.

Table 1: reservoirs non-compliant on 2 April 2013 and 2 January 2015

	Situation on 2 April 2013	Situation on 2 January 2015
No supervising engineer appointed	12	8
Inspection due, and no inspecting engineer appointed	12	14
Section 10 inspection overdue by more than a year, but an inspecting engineer has been appointed	0	0
Measures in the interests of safety overdue (not completed as soon as practicable or have exceeded the deadline set by the inspecting engineer)	51	40

Table 2: Data recorded between 1 April 2013 and 31 December 2014

Number of newly constructed reservoirs	36
Number of supervising engineer appointments	747
Number of inspecting engineer appointments	430
Number of 10(5) certificates after the satisfactory completion of an inspection under Section 10 of the Act	302
Number of these 10(5) certificates which contained measures to be taken in the interests of safety	132
Number of section 10(6) certificates showing that measures to be taken in the interests of safety had been satisfactorily completed	130

Table 3: Progress with risk designations up to 31 December 2014

Summary of progress to the end of December 2014		No. of reservoirs	Undertaker informed
STAGE: PROVISIONAL DESIGNATION			
Decision and sign-off	To be determined	739	n/a
	Determined as not high-risk	112	84
	Determined as high-risk	1126	334
STAGE: FINAL DESIGNATION			
Review of representations	Representations received	91	n/a
	Assessed	22	n/a
Decision and sign-off	Decision changed (not high-risk)	5	4
	Decision confirmed (high-risk)	0	0
STAGE: REVIEW OF DECISION			
	Reviews requested	0	0
	Assessed	0	0
Decision and sign-off	Decision changed	0	0
	Decision conformed	0	0

A risk based approach to enforcement

The main causes of non-compliance are:

- A supervising engineer has not been appointed. Every high-risk large raised reservoir must have a supervising engineer appointed at all times unless it is being supervised by a construction engineer;
- An inspecting engineer has not been appointed to carry out the Section 10 inspection;
- Safety measures identified by the inspecting engineer have not been completed by the specified date, or 'as soon as practicable'.

We continue to focus on reservoirs that pose the greatest risk to public safety. Our highest priority is to ensure that all reservoirs have a supervising engineer appointed at all times. We then make sure that reservoirs have an inspecting engineer appointed at the appropriate time, that the certificate and report are produced, and that safety measures are completed.

Provision of clear advice and guidance is our primary approach to secure compliance. We seek to encourage and persuade undertakers to comply by regular written and verbal communications and reminders. Over the past 21 months we have continued to carry out a number of site visits to meet reservoir undertakers. We have found that being present at the reservoir to explain why they should comply with the Reservoirs Act has been very effective in ensuring safety measures are completed. As a result, we have needed to serve fewer enforcement notices to get engineers appointed and safety work completed.

However, if advice, guidance and persuasion are unsuccessful then we will consider formal enforcement action.

When considering the appropriate course of action to ensure compliance we follow the Macrory Penalty Principles. These state that enforcement and sanctions should:

- aim to change the behaviour of the offender;

- aim to eliminate any financial gain or benefit from non-compliance;
- be responsive and consider what is appropriate for the particular offender and regulatory issue, which can include punishment and the public stigma that should be associated with a criminal conviction;
- be proportionate to the nature of the offence and the harm caused;
- aim to restore the harm caused by regulatory non-compliance, where appropriate; and
- aim to deter future non-compliance.

We believe in firm but fair regulation. Underlying our commitment to firm but fair regulation are the principles of:

- proportionality in the application of the law and in securing compliance;
- consistency of approach;
- transparency about how we operate and what those we regulate may expect from us;
- targeting of enforcement action; and
- accountability for the enforcement action we have taken.

Serving enforcement notices

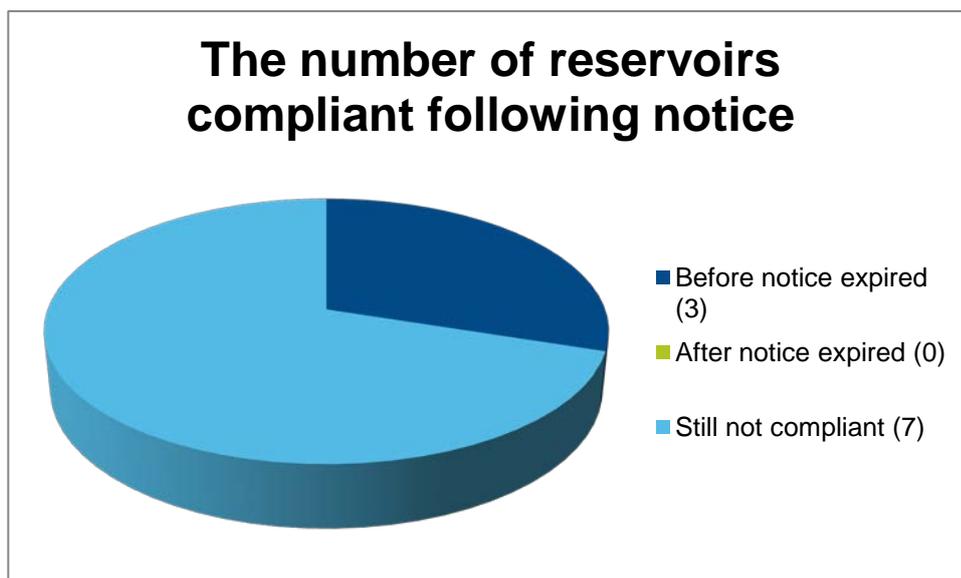
Where we are unable to persuade undertakers to make the relevant appointments or to complete the safety measures, one enforcement option is to serve notice, giving them a deadline to comply. The table below shows the number of notices served. Over the past 21 months we have served 12 notices at 10 reservoirs (see Appendix 1 for details). One reservoir had multiple notices served. The pie chart below shows whether or not the undertakers complied with the notice.

Table 4: Number of notices served 1 April 2013 – 31 December 2014

Notices served		
Section of the Reservoirs Act 1975	Non-compliance	Total number of notices served (1 April 2013 to 31 December 2014)
8(1)	No construction engineer appointed	1
10(7)(b)	Safety measures not carried out	11
Total number of notices served		12

Table 5: Number of reservoirs by undertaker type where notices have been served

Notices served by undertaker type		
Undertaker type	Examples	Total number of undertakers
Industrial	Manufacturing and chemical companies	1
Private landowner	Individuals, estates, developers	6
Public body	Local government	1
Water company		2
Total number of reservoirs		10



Other enforcement action

We have issued 6 written warnings to reservoir undertakers. Seven reservoirs are under investigation and further enforcement action may have to be taken.

Environment Agency reservoirs

The Environment Agency is the undertaker for 209 large raised reservoirs in England. Details of two Environment Agency non-compliances are given in Appendix 3.

4. The Future

On 30 July 2013, the Flood and Water Management Act 2010 changed how reservoirs are managed and regulated in England. The changes mean that in future, reservoir safety will be assessed based on the risk of danger to human life in the event of a dam or reservoir failure, as well as on the size of the reservoir.

We are in the process of assessing all 2,001 large raised reservoirs in England. Reservoirs where we think that an uncontrolled release of water could endanger human life will be designated as high-risk. We expect the provisional designation process to be completed by Summer 2015. Whilst this process is underway, the requirements of the Reservoirs Act 1975 continue to apply to all large raised reservoirs, until advised otherwise.

Once the risk designation process is complete, only large raised reservoirs that are high-risk will be subject to the full regulatory requirements of the Reservoirs Act 1975. Other large raised reservoirs will see a reduced level of regulation, with no statutory inspection or supervision requirements. However, other parts of the Act will still apply and these reservoirs still need to be registered in case of changes which alter the risk designation, such as downstream development or alterations to the reservoir.

We are working on a replacement for our reservoir act compliance and enforcement database which will make it easier for our staff to access information about reservoirs, respond to queries and monitor compliance under the amended Act.

5. Appendices

Appendix 1 – Steps taken by the enforcement authority to ensure that undertakers observe and comply with the requirements of the Reservoirs Act 1975

Reservoir	Undertaker	Type	Location	Number of enforcement notices served under Reservoirs Act 1975 section					Other enforcement action	Compliance status as of 31 December 2014	Offence
				8(1)	10(7)(a)	10(7)(b)	12(4)	16(3)			
Luton Hoo Lake Upper	Luton Hoo Park Ltd	Private landowner	Near Luton						Warning letter	Compliant	Late compliance with an enforcement notice served under section 10(7)(b)
Luton Hoo Lake Lower	Luton Hoo Park Ltd	Private landowner	Near Luton						Warning letter	Compliant	Late compliance with an enforcement notice served under section 10(7)(b)
Eccleston Mere	Pilkington Group Ltd	Industrial	Near St Helens			1			Warning letter	Compliant	Failure to carry safety measures into effect by the due date
Grassholme	Northumbrian Water Ltd	Water Company	Near Mickleton						Warning letter	Compliant	Failure to carry safety measures into effect as soon as practicable
Withins	P&F Properties Ltd	Private landowner	Near Radcliffe			1			Under investigation	Compliant	Non-compliance with an enforcement notice and failure to carry safety measures into effect by the due date
Arlington	South East Water Ltd	Water Company	Near Eastbourne			1			Warning letter	Compliant	Failure to carry safety measures into effect by the due date

Cheddar	Bristol Water Plc	Water Company	Near Wells			1			Under investigation	Non-compliant	Failure to carry safety measures into effect by the due date
Reservoirs A, B & C	Private individuals	Angling				3			Under Investigation	Non-compliant	Failure to carry safety measures into effect by the due date
Reservoir E	Private individuals	Private landowners				3			Under investigation	Non-compliant	Failure to carry safety measures into effect by the due date
Highams Park Lake	City of London Corporation	Local government	Near Chingford			1			Under investigation	Non-compliant	Failure to carry safety measures into effect by the due date
Marlbrook Quarry	Link Property Developments Ltd	Private landowner	Near Bromsgrove	1						Compliant	Alteration of a large raised reservoir without a construction engineer

Appendix 2 – Update on other third party non-compliant cases in England in appendix 5 of our 2011-2013 biennial report

Reservoir	Undertaker	Type	Location	Number of enforcement notices served under Reservoirs Act 1975 section					Enforcement outcome	Compliance status as of 31 December 2014	Comment
				8(1)	10(7)(a)	10(7)(b)	12(4)	16(3)			
Orchardleigh	Orchardleigh Estates Ltd	Private landowner				3			No further action	Compliant	Undertaker complied with the enforcement notices
Reservoir D	Private individual	Private landowner				4			No further action	Compliant	Undertaker complied with the enforcement notices

Appendix 3 – Environment Agency non-compliance

Reservoir	Location	Dates non-compliant	Offence	Current compliance status as of 31 December 2014	Steps taken
Kidderminster Flood Storage Reservoir	Kidderminster	1/4/14 - 4/8/14	Failure to carry safety measures into effect by the due date	Compliant	Internal review.
Saintbridge 2	Gloucester	1/4/14 - 9/10/14	Failure to carry safety measures into effect by the due date	Compliant	Written warning and internal review.

Appendix 4 – Statistics, engineer appointments and safety measures

Reference	Description	Number on 31/03/2005	Number on 30/03/2007	Number on 02/04/2009	Number on 05/04/2011	Number on 05/04/2013	Number on 02/01/2015	Description
Statistics for all English reservoirs								
1	Total number of 'large raised reservoirs' (LRRs)	1,715	1,799	1,889	1,913	1,944	2,001	Comprises those reservoirs that are 'in operation', 'abandoned', and 'under construction'
2	Total number of 'under construction' reservoirs	93	99	102	115	131	167	Includes both new reservoirs and those being modified
3	Total number of 'abandoned' reservoirs	-	3	3	4	3	3	Although empty, an 'abandoned' reservoir is still capable of holding at least 25,000m ³ of water above natural ground level
4	Total number of 'discontinued' reservoirs	-	175	191	210	219	225	

5	Total number of 'proposed' reservoirs	-	14	19	37	47	59	These are locations at which a LRR may be constructed in the future
6	Total number of undertakers	431	644	691	708	736	772	
7	Total number of LRRs for which the Environment Agency is the undertaker	124	161	180	189	198	209	
Supervising Engineer (SE) appointments								
8	Total number of LRRs with no SE	44	40	6	4	10	8	
Inspecting Engineer (IE) appointments								
9	Number of LRRs for which the next Section 10 Insp report is overdue	115	166	138	46	12	76	All reservoirs have to be inspected periodically by an IE, at intervals no greater than ten years. This includes cases in which an IE has been appointed, but a 10(5) certificate has not yet been issued.
10	Number of LRRs for which the next S10 Insp report is overdue, for which an inspection and report is in progress	-	129	134	45	0	62	
11	Number of LRRs for which the next S10 Insp has been overdue for at least one year	51	29	64	10	0	14	
12	Number of LRRs for which the next S10 Insp has been due for at least one year, for which an IE has NOT been appointed	-	1	3	0	0	0	
13	Number of LRRs for which the next S10 Insp has been due for less than one year for which an IE has NOT been appointed	-	-	1	1	12	14	
Measures to be taken in the interests of safety (MIOS)								
14	Total number of LRRs with MIOS,	278	277	303	267	199	172	MIOS are essential works identified by an IE during an inspection carried out under section 10 of the

	including those within the 'target period' set by the IE							Reservoirs Act 1975. The undertaker is legally required to implement MIOS*
15	Number of LRRs with MIOS that are still outstanding even though the target period has elapsed	-	49	40	41	35	36	
16	Number of LRRs with MIOS for which there is no target date but which have been outstanding for at least 5 years	-	5	5	1	3	0	If MIOS are still outstanding 5 years after the section 10 report then it is quite likely that they have not been implemented 'as soon as practicable'

* These figures do not necessarily represent non-compliance, just the total number of reservoirs that have safety measures identified, not all of which are outstanding beyond their target date. The figures will naturally vary according to how often engineers are identifying works that need doing at reservoirs, and we have no control over this. It is not necessarily a figure to be concerned about, unless the work is not done in time.

Distribution of dam category			
Dam category	Number of LRRs	% of total number of LRRs	Notes (Reference: Floods and Reservoir Safety; ICE1996)
A	681	34	Where a breach could endanger lives in a community
B	283	14.1	Where a breach could endanger lives not in a community or could result in extensive damage
C	432	21.6	Where a breach would pose negligible risk to life and cause limited damage
D	243	12.2	Special cases where no loss of life can be foreseen as a result of a breach and very limited additional flood damage would be caused
Not applicable	100	5	Historically, only impounding reservoirs have been assigned a dam category, which was originally for flood design purposes. Although this has changed, and the risks posed by all reservoirs are now being considered, some non-impounding and service reservoirs have not yet been assigned a dam category
Unknown	262	13.1	Section 10 Inspection reports, in which dam category information is normally supplied, are not available for all reservoirs (because the reports do not contain MIOS, and do not need to be submitted to the enforcement authority until a reservoir is designated high-risk).
Totals	2,001	100	

Distribution of undertaker type as at 21/01/2015		
Undertaker type	Number of LRRs	% of total number of LRRs
Agriculture (Farms and fish farms)	275	13.7
Environment Agency	209	10.4
Industrial	85	4.3
Other Government Agency	35	1.8
Other/unknown	0	0
Private landowner	397	19.8
Private utility	20	1.0
Public utility	186	9.3
Registered charity	149	7.4
Water company	646	32.3
Totals	2,002*	100

* Total number of reservoirs is slightly higher than stated elsewhere due to the later date that this data was collated.

Notes

1 – Reservoirs Act 1975 sections

- 8(1) No construction engineer appointed
- 10(7)(a) No inspection and report
- 10(7)(b) Measures to be taken in the interests of safety not carried into effect
- 12(4) No supervising engineer appointed

2 – Data protection

We have listed those undertakers that are limited companies, local authorities and charities.

The Data Protection Act 1998 does not permit us to publish the names of private individuals, including partnerships and sole traders.

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