Guidance for engineers on the completion of Schedule 12 – Inspection Reports.

Reservoirs (Scotland) Act 2011

SEPA
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

We are the Scottish Environment Protection Agency (SEPA). As Scotland's environmental regulator we protect and improve the environment by helping business and industry to understand their environmental responsibilities, enabling customers to comply with legislation and good practice and to realise the many economic benefits of good environmental practice.

We are a non-departmental public body, accountable through Scottish Ministers to the Scottish Parliament, and are experienced in providing advice and guidance to business, industry and the public on environmental best practice.

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1. Introduction

1.1 Introduction

1.1 Introduction

On the 1st April 2016 SEPA became the regulator for reservoir safety in Scotland under the Reservoirs (Scotland) Act 2011. Taking over responsibility for reservoir safety contributes to our strategic role in flood risk management, introduced by the Flood Risk Management (Scotland) Act 2009, by enabling a more streamlined and consistent approach to flood risk management.

Ensuring that reservoirs are correctly managed and maintained is essential. They provide Scotland with drinking water, power, resources for business and social amenities. The consequences of poor management and maintenance could be devastating and lead to a serious risk of flooding which impacts our communities, businesses, infrastructure and environment. We can manage this risk more efficiently through effective regulation.

Reservoir safety legislation is relatively new within the UK, with laws coming into effect in 1930. The Reservoirs (Safety Provisions) Act 1930 was passed following two major dam failures in 1925, which led to the deaths of 21 people. This legislation was followed by the Reservoirs Act 1975 (the 1975 Act). The 1975 Act was enforced by Scotland's 32 local authorities, with approximately 660 reservoirs falling within its remit. The new legislation, namely the 2011 Act, is now improving the regulatory landscape and changing our roles and responsibilities.

Prior to the implementation of the 2011 Act, SEPA undertook significant engagement with local authorities, panel engineers and reservoir managers to help inform our planning and development of key processes and systems. As a result of this work and the reservoir registration process for the 2011 Act we now have a comprehensive database which contains details of the reservoirs to which the 2011 Act applies.

As a modern regulator we proactively engage with the reservoir industry to increase your awareness of responsibilities under the 2011 Act and provide support, where possible, to help reservoir managers comply with the legislation.

We will help to support the reservoir industry through a suite of guidance documents that offer advice and good practice on how to fulfil the requirements of legislation. This supports reservoir managers by identifying the specific roles and responsibilities brought in by the 2011 Act. All guidance documentation can be found at www.sepa.org.uk/reservoirs. If you require a hard copy to be sent to you please email reservoirs@sepa.org.uk or call 03000 996699 to get put through to the Reservoir Regulatory Unit.

2. Completion of Schedule 12 – Inspecting Engineer Reports

2.1 General Information

2.2 Schedule 12 – Inspection Report Guidance

2.1 General Information

INSPECTION REPORT.

FORM OF REPORT UNDER SECTION 47(1) OF THE RESERVOIRS (SCOTLAND) ACT 2011 ("THE ACT")

The following provides some informal guidance and examples of what issues should be covered in the Inspection Report.

A copy of the Section 47 Report must be in the form given in Schedule 12 of the Reservoirs (Scotland) Regulations 2016, failure to do will result in the Report being returned to be re-produced using Schedule 12. Word versions of these can be found on the Scottish Government's reservoir web pages. . https://www.gov.scot/publications/reservoirs-legislation/

Section 47 Reports should be produced and submitted to the Reservoir Manager, and copied to SEPA and the Supervising Engineer within the statutory time scales as noted in Section 47(1) and section 47(4) of the Act.

It is also recommended that the Inspecting Engineer submits a full site visit report to the Reservoir Manager, including the description of the reservoir, the conditions found at the time of the inspection and the overall Engineers Findings, having regard to the structure given in table D5 of the ICE publication "A Guide to the Reservoirs Act 1975, 2nd Edition" apart from listing the recommended measures as these are stated in the Schedule. These reports may also be submitted to SEPA but **do not** preclude the need to submit a fully completed and detailed Section 47 Report.

All reports and documents should be submitted in a pdf format but if submitted in MS Word File Format it should be protected in a way that inhibits and prevents any amendments being made by anyone but the author.

2.2 Schedule 12 – Inspection Report Guidance

INSPECTION REPORT BY INSPECTING ENGINEER **UNDER SECTION 47(1) OF THE RESERVOIRS (SCOTLAND) ACT 2011**	
Reservoir registration number (as specified in the controlled reservoirs register):	*Please ensure this is completed correctly as failure to do so could mean it is rejected and returned to the engineer for correcting.*
Name (if any) and location of the reservoir:	*Please ensure that the name of the reservoir entered here matches that on the 'Controlled Reservoirs Register'*
National grid reference for the approximate centre of the reservoir:	
Name and address of inspecting engineer:	*Please ensure this is completed correctly as failure to do so could mean it is rejected and returned to the engineer for correcting.*
Name of panel of which engineer is a member:	
Name of reservoir manager(s):	*Please ensure that the name of the reservoir manager matches that on the 'Controlled Reservoirs Register'*
Date(s) of inspection:	*Please ensure this is completed correctly as failure to do so could mean it is rejected and returned to the engineer for correcting.*

I consider that the following measures ("listed measures") should be taken in the interests of the safety of the reservoir (including measures for the maintenance of the reservoir):

Guidance - Measures for Maintenance & Safety of the Reservoir.

This section is to comply with s47(3)(a) of the Reservoirs (Scotland) Act 2011.

*The Report should make clear which listed **measures are for the maintenance of the reservoir** and would require a direction under s47(3)(d)(i) (monitored by the supervising engineer & reported in their SEWS) and which are other **measures to be taken in the interests of safety** and require a direction under s47(3)(d)(ii) (measures to be taken under the supervision of the inspecting engineer or the other qualified engineer and certified when completed). Every reservoir is different and items listed will therefore be quite specific to the structure.*

Guidance – Measures for the Maintenance of the Reservoir.

Listed Measures for the maintenance of the reservoir

(i)

(ii)

(iii)

Maintenance measures will generally be maintenance issues that will require appraisal and/or action on a regular basis (examples might include valve exercising, grass cutting, tree-condition surveys/management, trash removal, drain clearance, vermin control, weed and vegetation removal from spillway screens) and which could impact on the safety of the reservoir. These will typically aim to aid monitoring, surveillance or effective operation of the reservoir as regards to safety.

When specifying routine maintenance works, the inspecting engineer should aim to be specific as to what is a sufficient level or frequency of maintenance in each case, so that all parties are clear as to what is intended and what would constitute non-compliance. It is an offence not to comply with a direction under s47(3)(d)(i).

It is envisaged that, in most instances, a frequency of each activity (e.g. cutting grass four times a year), the standard required, or a timescale after an incident in which maintenance should be done (e.g. drains cleared within 1 month of blockage noted) is recommended.

Measures included in a direction under 47(3)(d)(i) do not require an interim or final compliance certificate. A supervising engineer has to give notice in their annual statement of any failure to comply with the requirements of a direction under 47(3)(d)(i).

Examples of maintenance measures might include:-

- *If there are areas of upstream protection on the dam embankment that have a history of failure due to wave action these could be identified in the report and a direction given that remedial work should be undertaken to these within a set period of them being discovered.*
- *If there are areas on the downstream face of the dam embankment where there are, or have been, concerns over seepage or slight movement of the face a direction might be given regarding vegetation control (normally of grass cover). For example this might be a requirement to mow the area at least twice a year or to control the length of the grass by grazing.*
- *Occasionally there may be mature trees on the downstream face of a dam embankment or just beyond the toe. The inspecting engineer may have decided that these can be left in position if they do not pose an immediate risk to the embankment. However in such a case the inspecting engineer may give a direction under 47(3)(d)(i) that the trees should be inspected at specified intervals (5 years?) by a qualified aboriculturalist and any remedial work recommended undertaken within 1 year of a tree condition report being submitted. The inspecting engineer may also direct that saplings which become established on the dam embankment be removed within a specified period (1 year?) of being identified.*
- *Regular exercising of valves required to draw the reservoir down in an emergency might be directed under 47(3)(d)(i). This may be quarterly to make sure the valves operate freely and annually over the full travel of the valves, or such other periods that the inspecting engineer feels appropriate.*
- *Where there are screens in front of the overflow weir and there is a good reason why these cannot be removed, it might be appropriate to include a direction under 47(3)(d)(i) to clean the screens at certain intervals or at a prescribed degree of blockage of the screen.*
- *At sites which have an air bubbler system just upstream of the overflow weir the inspecting engineer may feel it appropriate to direct under 47(3)(d)(i) that the system be checked for operation prior to the onset of each winter and at specified intervals during the winter period.*
- *Many concrete dams have pressure relief wells which are critical to the control of uplift pressure under the dam. On certain structures these may have a history of becoming blocked, on others they may just suddenly cease to operate effectively. An inspecting engineer may therefore direct under 47(3)(d)(i) that they be cleared at specified intervals and/or that they be cleared within a specified time of them being noted as being blocked.*

Guidance – Measures in the Interest of Safety.

Listed Measures to be taken in the interests of safety

(iv)

(v)

(vi)

Other measures that should be taken in the interests of the safety of the reservoir are generally specific and urgent interventions which are required within a given timeframe to preserve reservoir safety.

Measures specified in the interests of safety are best expressed in terms that allow the reservoir manager and the inspecting engineer or other qualified engineer acting under s47(3)(d)(ii) some flexibility in the means of implementing the measures. The measures should avoid being prescriptive, as detailed design may still have to be carried out. They should be limited to measures that can be certified as having been completed. Measures to be taken in the interests of safety place a legal obligation on the reservoir manager to see that they are carried out and have the force of law.

The inspecting engineer must state a period of time by which measures in the interests of safety should be completed. Periods of 1 – 3 years are commonly specified. The completion date should be clearly indicated against each safety measure.

Of the listed measures, the following were also specified in the previous inspection report (if none was so specified, state "None"):

[The following measures, which were specified in the previous inspection report, have not been taken. I consider that these measures should no longer be taken for the reasons specified below in relation to each measure:] (delete if there are no such measures)

Guidance – Measures from Previous Reports.

There may have been measures in the previous report that were met but not certified because the work undertaken was not strictly as stipulated in the previous report. If you are confident that the required safety aspect has been met and the measure no longer required you state this and clearly indicate which measure it is, what work was undertaken and why you feel that it is no longer required.

If previous measures have not been taken and you feel they are no longer required because you have superseded them with similar measure in the new report then you should clearly indicate this and stipulate which new measure replaces it.

Measures are only considered to have been taken once the appropriate engineer has issued the necessary certificates (IICC/ICC). If the works have been completed by the reservoir manager but have not been certified by the appropriate engineer then they should be considered as incomplete and should be referenced here.

I direct the reservoir manager to ensure:

- that listed measures *(i)* - *(iii)* for the maintenance of the reservoir are monitored by the supervising engineer, and
- that other listed measures *(iv) & (v)* are taken under the supervision of the inspecting engineer or the other qualified engineer within the period of time specified for each of the listed measures.

The next inspection of the reservoir should take place on: [insert date of inspection]

Guidance – Date of Next Inspection.

This may give a specific date or state that the next inspection has to take place before a certain date, either way it should be clearly stated.

S47(3)(f) [I consider that the following matters should be monitored by the supervising engineer until the next inspection:] (delete if there are no such matters)

Guidance – Matters to be Monitored by Supervising Engineer.

It would be good practice for this section to include a recommendation for the frequency of visits by the supervising engineer.

The matters to be watched should relate to those items that are critical to the integrity of the reservoir structures, and in particular to those that would pose a threat to the safety of persons or property

In a list of matters to be watched,

- *Any item referred to should be specific and clearly identifiable*
- *What would constitute signs of adverse behaviour should be clearly stated*
- *The action to be taken if the adverse behaviour is observed should be proposed*

S51 of the Act provides for the inspecting engineer to give directions concerning the manner in which information in relation to recorded matters is to be recorded and the intervals at which the record is to be updated. It is an offence for a reservoir manager not to comply with a s51 direction. The Direction should be kept separate from the Inspection Report but the inspecting engineer may want to note in this section that one has been issued and that these should be monitored by the SE. Suggested wording:-

"A Direction under section 51 (Recording of water levels etc. and record keeping) has also been issued to the Reservoir Manager specifying the instrumentation readings to be taken, analysed and acted upon in an appropriate timescale and these are matters that should be monitored by the SE "

S47(3)(g)[I make the following recommendations on other matters (in relation to which I have not specified any listed measures) which I consider relevant to the maintenance of the reservoir:] (delete if there are no such matters)

Guidance – Other Maintenance Matters.

It is envisaged that these would be non-critical or advisory matters. These might include matters such as concrete and masonry repairs, joint sealant repairs, painting of metalwork, minor repairs to valves and pipework unless the inspecting engineer felt them sufficiently serious to have them as listed items under 47(3)(a) and subject to compliance certification under Section 48.

General vegetation clearance of the approaches to the spillweir might also come under 47(3)(g) unless there were specific concerns that vegetation control was critical to the performance of the overflow.

Signature of engineer	*Please ensure this is completed as failure to do so could mean it is rejected and returned to the engineer for correcting*
Date signed	*Please ensure this is completed as failure to do so could mean it is rejected and returned to the engineer for correcting*

3. Further Information

3.1 Frequently Asked Questions

3.2 Sources of Information

3.3 Glossary

3.1 Frequently Asked Questions

Here are some frequently asked questions relating to the new regulations for reservoirs in Scotland. After reading this section, if you have some unanswered queries please look at the sources of information section. A glossary is also included to help you understand some of the new terms and concepts associated with the 2011 Act.

Q. Does the 2011 Act apply to all reservoirs?

A. Currently the requirements of the 2011 Act only apply to reservoirs capable of holding at least 25,000 cubic metres of water above the lowest ground level. When fully implemented it will apply to those reservoirs capable of holding at least 10,000 cubic metres of water above the lowest natural ground level.

Q. How many reservoirs will be regulated by 2011 Act?

A. There are currently 686 reservoirs in Scotland that are regulated under the 2011 Act. In addition to these sites it has been estimated that there could be a further 800 to 850 reservoirs that would fall under the 2011 Act, when the registration for reservoirs that hold or are capable of holding 25,000 cubic metres of water above natural ground level is reduced to 10,000 cubic metres of water above natural ground level.

Q. Who is responsible for enforcing reservoir safety?

A. SEPA are the regulatory authority for reservoirs in Scotland. We took over responsibility for the enforcement of reservoir safety from local authorities in April 2016.

Q. What is the role of SEPA as the regulatory authority?

A. SEPA, as the regulatory authority, are responsible for comprehensive regulation and enforcement of the 2011 Act. We are also required to maintain a Statutory Public Register of Reservoirs and to produce biennial reports to the Scottish Government.

For further information, please visit www.sepa.org.uk/reservoirs

Q. Who is the reservoir manager?

A. The operator(s), user(s) and/or owner(s) of the reservoir. This can be more than one person or company.

Q. Who has ultimate responsibility for the safety of reservoirs?

A. Under the 2011 Act, reservoir managers (operators, users and owners) have ultimate responsibility for the safety of their reservoirs. They must operate within the law, and must consider the need for planning permission or environmental consents when introducing measures to be taken in the interests of safety.

Q. Who are panel engineers?

A. Panel engineers are a group of specialist civil engineers (“qualified civil engineers”) who are experienced and qualified in reservoir safety. They are appointed by Scottish Ministers to one of the panels for a specific period, typically five years. Towards the end of this period, the civil engineer has to re-apply for appointment to the panel.

The 2011 Act requires them to oversee the safe construction, operation and maintenance of reservoirs and inspect their safety every ten years or more frequently if necessary. A panel engineer must be appointed by the reservoir manager when a new reservoir is built or repairs and changes are made to existing ones where these might affect the safety of the reservoir. Panel engineers (qualified civil engineers) may be construction engineers, inspecting engineers or supervising engineers.

The list of current panel engineers can be found at:
https://www.gov.scot/publications/reservoir-engineers-panels-member-lists/

Q. What is the role of a construction engineer?

A. A construction engineer is appointed by the reservoir manager to supervise the design and construction of a new reservoir, the modification of a reservoir, for example if it changes its capacity or for other work which might affect its safety and for which Scottish Ministers have issued regulations.

Q. What is the role of the inspecting engineer?

A. The inspecting engineer's role is to inspect the reservoir when appointed to do so by the reservoir manager, to advise the reservoir manager of the condition of the reservoir and to make recommendations regarding works required to ensure its continued satisfactory operation, to give directions regarding monitoring required in the period up to the next inspection, and to provide advice on matters to be watched by the supervising engineer.

Q. What is the reservoir manager's role in the inspection process?

A. The reservoir manager should normally attend the inspection and provide the inspecting engineer with the necessary documents to help them carry out the inspection. It is recommended that the reservoir manager check the report to make sure it is accurate before it is finalised and issued. They also have an opportunity to check any queries with the inspecting engineer, such as what measures to be taken in the interests of safety he/she may need to introduce.

Q. What is the role of the supervising engineer?

A. A supervising engineer is appointed by the reservoir manager and is required to notify the reservoir manager about any safety issues related to the reservoir. They are also required to monitor any matters specified in safety reports, preliminary and final certificates as well as inspection reports. They are also required to report to the reservoir manager and SEPA any failures to comply with the previously mentioned reports and certificates. The supervising engineer must produce a written statement at least every 12 months which must be supplied to the reservoir manager and SEPA.

Q. What other organisations are responsible for the enforcement of safety issues that are not covered by the Reservoirs (Scotland) Act 2011?

A. We recognise the role of other organisations and will not take on responsibilities that rightly sit with others or duplicate effort unnecessarily. In particular the Health and Safety Executive has a key role under the Health and Safety at Work etc. Act 1974 and Local Authorities have key roles in addressing site safety under the Building Act 1984 (section 76 to 79). We will provide information to these bodies on risks that we find that are their responsibility.

3.2 Sources of Information

3.2.1 SEPA

www.sepa.org.uk

As the enforcement authority for reservoir safety in Scotland the SEPA website hosts comprehensive information on reservoir safety. We also have a national, strategic role for flood risk management and are the flood warning authority for Scotland.

3.2.2 Scottish Government

https://www.gov.scot/policies/water/reservoir-safety/

The Scottish Government oversees the implementation of the Reservoirs (Scotland) Act 2011. A list of panel engineers is available from the Scottish Government website, along with information on development of the new legislation.

3.2.3 Institution of Civil Engineers

www.ice.org.uk

The Institution of Civil Engineers (ICE) seeks to advance the knowledge, practice and business of civil engineering, to promote the breadth and value of the civil engineer's global contribution to sustainable, economic growth, and ethical standards, and to include in membership all those involved in the profession. The ICE, through its Reservoirs Committee, advises government ministers on the appointment of Panel Engineers.

3.2.4 British Dam Society

www.britishdams.org

The British Dam Society (BDS) is an Associated Society of the Institution of Civil Engineers. It exists to advance the education of the public and the profession in technical subjects relating to the planning, design, construction, maintenance, operation, safety, environmental and social issues of dams and reservoirs. The BDS is also a member of the International Commission on Large Dams (ICOLD).

3.2.5 International Commission on Large Dams

www.icold-cigb.org

International Commission on Large Dams (ICOLD) comprises 82 countries and seeks to develop dams in a technically safe, ecological and socio-economically sustainable manner.

3.3 Glossary

Term	Definition
Civil sanctions	An enforcement intervention that can be applied directly by the regulator.
Controlled reservoir	After the Reservoirs (Scotland Act) 2011 is fully implemented, a controlled reservoir will be a structure designed or used for collecting water which is capable of holding 10,000 cubic meters of water or more above the natural level of any part of the surrounding land.
Dam	A dam is a manmade barrier usually built across a river to hold back water forming a loch or reservoir behind it. It can be constructed from concrete or natural materials like earth and rock.
First risk designation	The risk designation ('high', 'medium' or 'low') is assigned to a reservoir once the period for representations has ended.
Impoundment	Any dam, weir, or other works by which water may be impounded (i.e. collected and stored); or any works diverting waters in connection with the construction or alteration of any dam, weir or other works. Raising the level of an existing natural loch is also considered an impoundment. A pond or loch created by excavation below the pre-existing ground level (e.g. a dug pond or flooded quarry) is not included.
Incident reporting	Reservoir managers should report to SEPA incidents that have occurred at their reservoir.
Inspecting engineer	Appointed by the reservoir manager of a high risk or medium risk reservoir to carry out an inspection.
Inundation map	A map showing areas that would be affected by flooding from releases from a dam's reservoir. The flooding may be from either controlled or uncontrolled releases or as a result of a dam failure. A series of maps for a dam could show the incremental areas flooded by larger flood releases.
Nominating reservoir manager	A reservoir manager who has nominated another manager to act on their behalf for decisions relating to the safety of the reservoir.
Nominee	Nominated to act on behalf of multiple reservoir managers and may act as a central point of contact in correspondence with SEPA. All individual reservoir managers are still legally responsible for complying with regulation.
Panel engineer	A specialist civil engineer appointed by Scottish Ministers. All reservoirs must be designed, constructed, inspected and supervised by a panel engineer.
Provisional risk designation	SEPA is required to give a provisional risk designation to all registered controlled reservoirs as soon as practicable once registered. Reservoir managers are able to make a representation to SEPA within two months if they are dissatisfied with the risk assigned to their reservoir.

Register	The reservoir manager of each controlled reservoir must register the reservoir with SEPA. SEPA must establish and maintain a controlled reservoirs register which contains specific information on each reservoir. SEPA must make the controlled reservoirs register available to the public at all reasonable times.
Representation	If a reservoir manager is dissatisfied with the risk designation assigned to their reservoir following SEPA's provisional risk designation, they can make a representation to SEPA explaining why they feel that the risk designation is wrong.
Reservoir	Reservoirs are artificial storage places for water, such as ponds, impoundments and raised lochs, from which the water may be withdrawn (abstracted) for purposes such as electricity generation, irrigation, water supply or flood storage. They can also be recreational or amenity sites from which no water is normally abstracted.
Reservoir manager	This is the new term under the Reservoirs (Scotland) Act 2011 for the manager or operator of a reservoir. Reservoir Managers have ultimate responsibility for the safety of their reservoirs and will have control over the operation of the dam. The definition has been updated so as to ensure organisations who merely lease or use the water, such as angling clubs, may not be responsible for supervisory and maintenance requirements. However if under the terms of the lease they are required, for example, to operate valves then they may be classed as reservoir managers.
Review	A reservoir manager may seek to have their reservoir's risk designation reviewed if following a representation they are still dissatisfied with the risk designation given to their reservoir. SEPA is also required to undertake a review of a reservoir's risk designation when it considers it to be no longer appropriate or by the end of the period of six years.
Risk designation	The Reservoirs (Scotland) Act 2011 requires SEPA to assign a risk designation of either 'high', 'medium', or 'low' to all controlled reservoirs. The risk designation will be based on the potential impacts on a variety of receptors from an uncontrolled release of water. 'High' risk sites will receive a greater level of regulation than either 'medium' or 'low'.
Supervising engineer	Appointed by the reservoir manager of high and medium risk reservoirs to monitor matters as required in various engineers certificates and reports.
Undertaker	In terms of the Reservoirs Act 1975, the "undertaker" is the person or organisation with responsibility for a reservoir. The "Reservoir Manager" will replace the "undertaker" and be responsible for registering each controlled reservoir under the Reservoirs (Scotland) Act 2011.