Basic Details

Publish Date

02 September 2025

Case ID#

3249

Title

Leakage and breach of washland flood storage embankment

Nation

England

Regulator Reference No.

509

Legal Status

Statutory

Reservoir Type

Impounding

Reservoir Capacity

10M+ m3

Year of Construction

< 1800

Main Construction Type

Earth fill embankment

Dam Height

2 - 4.99 metres

Dam Flood Category

A

Hazard Class

High-risk reservoir

Reservoir Use

- Other

Owner Type

Public body

Incident Details

Date & Time of Incident

09 August 2024 - 12:00

Date Incident Closed

Observations that Caused the Incident to be Declared

- Leakage or seepage from a new leakage point
- Unexpected leakage or seepage from a known leakage point
- Water flowing outside of engineered channels

Describe the Incident

Two incidents occurred at this site, which is washland flood storage reservoir. The embankment affected was a cradge bank. This is a permanent bank constructed at a lower level to the main dam embankment. It would be overtopped before the main defence bank in a flood event. For the first incident, the undertaker noticed leakage during a planned annual inspection with the supervising engineer. The undertaker regularly monitored: the rate of leakage, any turbidity in the leaking water level of water in the river from where the leak was suspected At the time of the first incident, the reservoir had not impounded water for a considerable time. If the cradge bank were to fail, the ability of the dam to safely sustain a sudden hydraulic impact load from the inflow was uncertain. Monitoring continued. A member of the public reported the second incident, which occurred 3 months later. The noticed a leak through the cradge bank between the river and the reservoir the reservoir was filling because of the leak. By the afternoon, the bank had breached. The undertaker inspected the bank. They found it was overtopping in many places, resulting in scour damage to the crest and slips on the downstream face. The undertakers inspected the bank using safe vantage points nearby and drone footage. Access to the dam during impoundment is not possible. The breach happened at a location which is designed to overflow and allow water into the reservoir. Due to this fact, it was not deemed a reservoir safety issue. It did impact the operation of the reservoir and could alter the flow regime of the river. The breach of the cradge bank did not impact the structural integrity of the main dam. The photos show the breach developing, during the event, and after the eventThe undertaker investigated the cause of the incidents. The affected embankment is 400 years old and 20 km long. The structure is made from local material that has a low cohesive material content. There has been significant historical activity from badgers. Their former setts are often collapsed, which cant be seen from visual inspection. They are sufficiently porous to enable water to enter the embankment and lead to piping failure.

Supporting Photos

Leakage and breach of washland flood storage embankment - Incident Image

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Causes and Impacts

Natural Processes which Initiated or Contributed to the Incident

- None

Main Contributing Factors to the Incident Occurring

Dam Factors

- None

External Factors

- Other external factors (describe below)

Shortcomings

- Process or procedural shortcoming

Root Cause of the Incident

Impacts on the Reservoir

- External erosion

Supporting Photos

Supporting Contributions and Studies

Human Factors which Influenced the Incident

Instrumentation at the Reservoir

Not applicable. There is no instrumentation present that would have indicated this issue.

Was Instrumentation Effective?

Not Applicable

Assistance by External Parties and Impacts on Downstream Population

None

Summary of Studies or Investigations Undertaken

Investigations are at an early stage and are focused on understanding how the construction works could occur within a public highway on the crest of the dam (under the control of the highway authority) and without any consultation with the Environment Agency by the water company installing the pipe.

Lessons Learnt

Lesson 1

- Surveillance and Monitoring

Engagement of the local communities, farmers and other third parties to actively report any issues they observe should be encouraged. It was an important and valuable source of information for these incidents.

Lesson 2

- Operation and maintenance

Burrowing animal activity can lead to vulnerabilities in dams. Surveillance and early action is important to identify when animals may be burrowing in dams and mitigate any impacts. If historical activity is known about, repair works may be required to reduce the risk of piping failure.

Lesson 3

- Surveillance and Monitoring

This highlights the practical difficulties associated with surveillance, monitoring and physical intervention on very long internal washlands type banks. This is particularly the case during high flow conditions

Lesson 4

Closing Comments

Acting to investigate and rectify leakage early may reduce the risk of more serious events happening afterwards.

Supporting Photos

Leakage and breach of washland flood storage embankment - Closing Image

Information provided has been sent from reservoir owners and engineers, and cleansed of personal information by the enforcement authority. We cannot guarantee the accuracy of the data, but if you find an error please contact the relevant enforcement authority.