

**DRINKING WATER INSPECTORATE**

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**DWI Information Letter 13/97**

**12 November 1997**

**To: Board Level Contact of Water and Sewerage Companies  
In England and Wales**

Dear Sir or Madam

**Incidents Involving Discoloured or 'Dirty' Water Supplies**

**Purpose**

1. The purpose of this letter is to give water companies advice:
  - (a) on some of the matters the Inspectorate looks for in its investigation of incidents, particularly those involving badly discoloured or 'dirty' water; and
  - (b) when it considers that water unfit for human consumption may have been supplied, on some of the matters it takes into account in considering whether a company is likely to have a defence that it took all reasonable steps and acted with all due diligence for securing that water was fit for human consumption on leaving its pipes.

This letter should not be interpreted as a code of good practice

**Background**

2. In my statement in Drinking Water 1996, I mentioned my concern about the increasing number of incidents involving badly discoloured or dirty water that had been notified to, and were being investigated by, the Inspectorate. In 1996, 42.1% of all notified incidents were due to dirty water associated with distribution systems (burst mains, repairs to mains, rezoning etc) compared to 25.3% in 1995 and 20.5% in 1994 for a similar number of total incidents in each year. Generally there are no risks to health from such incidents but the supply of discoloured water is very unpleasant for consumers and they are entitled to, and should receive, a better quality of service
3. The Inspectorate has analysed the causes of discoloured water incidents. Often they happen because of actions taken by company personnel such as the careless or inept operation of a treatment works or distribution system, including service reservoirs, leading to increased velocity of flow or reversal of flow causing suspension of deposits already present in the system. These actions are entirely within the control of companies.
4. The main causes the Inspectorate has identified include:

- poor operation of treatment works, or significant increase in output from treatment works, causing flocculated material, other particulate matter or inadequately flocculated water to enter supply;
- increasing the output from treatment works or bringing in new or stand-by sources to meet increased demand or an emergency supply problem (e.g. burst main or service reservoir down) causing increased velocity of flow or reversal of flow and suspension of deposits in the distribution system;
- opening/closing valves, altering significantly the degree to which a valve is open/closed and operating other equipment in the distribution system to meet changes in demand and to deal with emergencies also causing increased velocity of flow and reversal of flow and suspension of deposits in the distribution system; and
- opening valves or operating other distribution system equipment causing old, stagnant or stale water from an unused part of the system to enter supply.

Another cause can be the operation of fire hydrants by the fire authorities or licensed or illegal users of the distribution system, including vandals, resulting in the suspension of deposits in the system often some distance from the hydrants.

### **Action by Water Companies**

5. The Inspectorate acknowledges that it may be some years before some companies will have completed all the rehabilitation work in their distribution systems which is necessary to avoid or minimise the problems of deposits caused by inadequate removal of certain substances at treatment works in previous years or by internal corrosion of old iron mains after years of service. The Inspectorate also recognises that many companies have taken, or are taking, other action to minimise the risk of consumers being affected by a discoloured water incident.

6. However, the Inspectorate considers that water companies should now review these actions and where necessary introduce new or modified actions to minimise the risk of consumers being affected by a discoloured water incident. The Inspectorate expects, *inter alia*, that water companies:

- should have a maintenance strategy for their distribution systems, irrespective of whether mains have been, are to be or are not to be rehabilitated, which may include periodic flushing, swabbing or air scouring to remove the worst deposits and periodic cleaning of service reservoirs;
- should have operational procedures for treatment works when there is a need to increase output significantly to meet demand; these procedures should be designed to avoid flocculated material or other particles entering supply and to avoid or minimise the disturbance of any deposits in the distribution system;
- should have operational procedures for bringing in new or standby water treatment works in a way that avoids flocculated material or other particles entering supply and avoids or minimises the disturbance of any deposits in the distribution system.

- should have adequate records/maps/diagrams of their treatment works with the location of all valves and other key equipment;
- should keep records of the status (e.g. open/closed) of valves or other key equipment at treatment works or have the status clearly marked on the valves or other equipment, or have other adequate operational procedures in place, so that anyone who may need to make a change to the operation of a works can easily find out the status;
- should have adequate records/maps/diagrams of their distribution systems with the location of all valves and other key distribution equipment/features clearly marked;
- should keep records of the status (e.g. open/closed) of each valve or other key equipment in the distribution system or have the status clearly marked on the valve or other equipment, so that anyone who may need to make a change to the operation of the distribution system can find out easily the status; and
- should have in place procedures for making any major or significant changes to the operation of the distribution system so as to avoid or minimise the disturbance of any deposits in the system.

7. In developing the relevant procedures for changing the operation of existing treatment works and starting the operation of new and standby treatment works and for making major or significant changes to the operation of the distribution systems water companies:

- should consider the results of network modelling of the distribution systems;
- should consider "what if " scenarios in respect of major failures at treatment works, service reservoirs or the distribution system, including major bursts;
- should ensure that there is adequate communication between relevant company personnel;
- should have adequate arrangements for monitoring such operational changes, including sampling/analyses, to identify any problems early, including the extent and seriousness, and to permit pre-planned steps to minimise the effects;
- should take into account lessons learned for any previous incidents; and
- should have a plan for dealing with each potential major failure which includes avoiding or minimising the impact on drinking water quality.

8. As indicated above use of fire hydrants by fire authorities can cause dirty water incidents. The Inspectorate expects water companies to have satisfied themselves that fire authorities are fully briefed and fire authority personnel have been adequately trained on the correct use of fire hydrants, including when testing hydrants. Water companies should ask fire authorities, whenever practicable, to advise immediately on the location of a fire and its potential severity so that

companies can consider whether they can do anything operationally to minimise the risk of supplying dirty water. This should apply to any other organisation that may be permitted to abstract significant quantities of water from hydrants.

9. When a water company is planning to make a major or significant change to the operation of a treatment works or the distribution system and, despite planning to take precautions to avoid or minimise disturbance of deposits, it believes that there is a significant risk of supplying dirty water, it should advise the likely affected consumers of the situation in advance and provide them with appropriate information and advice, including if necessary alternative supplies.

### **Supply of water unfit for human consumption**

10. When there is a drinking water quality incident involving the supply of discoloured or dirty water in which the Inspectorate judges that water unfit for human consumption may have been supplied, the Inspectorate takes into account the matters addressed in paragraphs 5-9 above in assessing whether the water company is likely to be able to mount a defence that it took all reasonable steps and acted with all due diligence for securing that the water was fit for human consumption on leaving its pipes.

### **Enquiries about this letter**

11. Any enquiries about this letter should be addressed to Owen Hydes, Deputy Chief Inspector, Zone 2/E4 (telephone 0171 890 5960) or John Gray, Principal Inspector, Zone 2/E1 (telephone 020 7944 5973).

12. Copies of this letter are being sent for information to the Secretaries of the Water Services Association and Water Companies' Association; the Director General of Water Services; Mr A Wells, Water Supply and Regulation Division, Department of the Environment, Transport and the Regions; Mr R Macey, Environment Division, Welsh Office; Mr T Hooton, Scottish Office and Mr R Scott, Drinking Water Inspector for Northern Ireland.

13. Please acknowledge receipt of this letter using the enclosed slip and envelope.

Yours sincerely,

M J Rouse  
Chief Inspector