

# Incident Assessment

Amlaird RSZ  
Hydrocarbon Failures  
21 April 2013

DWQR Inspector:  
William Byers

Event No. 5306

**Category: Serious**

## Summary of Incident

A consumer complaint on 21 April 2013, of fuel or solvent taste in the water supply in Glasgow Road, Kilmarnock, resulted in samples being taken from the property and these showed the presence of hydrocarbons at a level of 1058 µg/litre. The sample also contained levels of manganese, aluminium and pH, which exceeded the standards. The result led to a concern of possible contamination of the supply and further sampling in the area was carried out and precautionary flushing of the mains was then initiated. With the further results confirming similar levels of hydrocarbons and of the other parameters, a formal incident team was put in place to manage the unfolding incident. It was clear that there was a limited number of properties affected and those householders were instructed not to use the water and were provided with alternative, emergency supplies.

The Glasgow Road forms a main route for water mains into Kilmarnock and in the area where complaints arose, there are four mains in the street. Properties reporting taste complaints were located on only one side of the street and there was a possibility of two mains of 16" and 10" diameter having been affected. Investigations and sample results led to the larger main being determined as the source of the problem. There was however, no indication as to where or how the issue had arisen and consequently, it was decided that all connections would be transferred to the 10" main to restore a compliant water supply to the properties affected.

The connection transfers were completed and confirmation provided that all subsequent water samples were showing no failures of the water quality standards allowing restrictions on water use to be lifted on 29 April.

## DWQR Assessment of Cause of Incident

Scottish Water had been carrying out investigations on the water mains in Glasgow Road to determine the potential for removing redundant pipework and to get to the bottom of suspected cross-connections between mains. An operation to verify the status of a line control valve on the 16" water main on 17 April, which was believed to be in an open position, had in fact opened the valve and caused water from a higher pressure zone to enter into the area for a short period of time. However, this would be sufficient to cause a disturbance and shift of stagnant water lying in what is now understood to have been a dead end in the supply system. DWQR believes this to be the root cause of the taste complaints and of the failures of water quality parameters.

The investigations have shown that a number of aspects of records held on the connectivity of valves between mains, the location and type of fittings and the understanding of cross connections have been inaccurate. DWQR is satisfied that the plans and arrangements for the investigative work were appropriate to the recorded configuration of valves and mains. It is now known however that consumers connected to the 16" main in this area were supplied via a cross connection some way south of their location, feeding back northwards to the last property connection. With no flow beyond this point back to the tested line control valve, the main contained water that had remained static for an indeterminate but long period of time. The presence of aluminium and manganese in samples is consistent with sudden change in flow conditions within old water mains. These pipes were installed around 100 years ago, with a bitumen lining to protect against corrosion and it is common for these to now cause hydrocarbon type tastes. Particularly where water has lain dormant for an extended period of time.

## **DWQR Assessment of Actions Taken by Scottish Water**

Scottish Water took appropriate action to respond to the developing situation and the suspected contamination of the water mains. DWQR considers their investigation of the possible sources of the high levels of hydrocarbons to have been thorough. Taking on board both internal and external specialist advice from experts in the field, the possibilities of backsiphonage through consumer connections, permeation of contaminants present in the ground from the former site of a petrol filling station into the mains and the opportunities for backsiphonage or ingress through pipeline fittings were examined.

DWQR considers it essential that accurate records are kept of the configuration of water mains and fittings to ensure water supply systems can be managed effectively. The necessary activities required to clarify suspected deficiencies in records held for this part of Glasgow Road have, on this occasion, had the unfortunate result of generating and supplying poor quality water to consumers. DWQR is however of the view that Scottish Water must put in place firmer guidance for staff testing the status of line valves to ensure all necessary precautions are taken to avoid such consequences.

Our investigation has shown that this incident has again demonstrated a case where no record of a valve operation had been returned from site, which is contrary to the established DOMS procedure. These records are essential for the demonstration of due diligence in the operation of distribution systems and DWQR considers the failure to adhere to DOMS as a serious issue which Scottish Water must address.

The event has been categorised as serious.

Scottish Water identified a number of actions and DWQR accepts that these are appropriate. Additionally, DWQR has made a number of recommendations following this incident and will be monitoring to ensure all are completed prior to signing off the incident.

