

## Back Tolsta WTW Aluminium Failure 18 January 2015

DWQR Inspector:  
Moira Malcolm

Event No. 6698

### Event Category: Significant

### Summary of Incident

On 18<sup>th</sup> January 2015 operational staff were called to Back Tolsta WTW to a plant shutdown due to low chlorine levels for 20 minutes. Investigation found that the aluminium dosing pump had stopped dosing which caused a loss of coagulation at the works. The coagulation loss caused water with high turbidity to pass through the filters and the water to have a high pH. This high pH then caused the aluminium floc to re-dissolve and pass into supply resulting in aluminium levels above the prescribed concentration or value (PCV) entering distribution for a period of over 2 ½ hours. No customer contacts were received.

### DWQR Assessment of Cause of Incident

Several factors contributed to this incident:

- The aluminium dosing pump failure was due to a blown fuse which stopped the pump from dosing. The flow monitor did not alarm due to the configuration of the power supply and MCC.
- The changes to coagulation pH were not noted due to a blocked sample line to the monitor preventing the proper analysis of the process water and consequent generation of an appropriate alarm.
- Filtered water monitors for both aluminium and turbidity should register, alarm and cause plant shutdown. This did not occur because the alarm points had been wrongly set, by a decimal place, as 1600µg/l instead of 160µg/l for aluminium and 2.0NTU instead of 0.2NTU for turbidity. These were manually input and it is this human error which is the root cause of the event.
- During the investigation it was found that the incorrect alarm set points had caused water non-compliant for aluminium to enter supply for approximately 1 hour on 9th January 2015. This was during an extreme weather event to which the non-compliance had originally been attributed.

### DWQR Assessment of Actions Taken by Scottish Water

DWQR is satisfied that when alerted to the event, Scottish Water staff worked well to resolve the problem and rectify the issues.

Several issues were noted and are pertinent:

1. The site diary had sparse information on the incident which made it difficult to investigate. Good record keeping is essential to demonstrate the activities of operational staff and is vital to investigate problems in hindsight. Detailed site diaries, along with task scheduling, should be routine practice at all WTW. Where this is routine, it is then easier for staff to maintain during events as it is part of their normal working procedure.



2. Scottish Water investigated the incorrect set points and concluded that these must have been changed manually several months before the incident, although no individual was attributed to this. The human error of changing the alarm set points demonstrates a lack of understanding and/or training in this area. Again, no record of the changes was made in the site diary.
3. No failures were found in distribution, however only 1 sample was taken which was 8 days after the event. Sampling was not carried out, nor the cryptosporidium rig utilised, because staff thought the non-compliant water did not enter distribution because of the plant shutdown and the wrongly set alarm settings were not recognised until the incident was investigated. From the information available at the time of the incident this action appears appropriate.

The event has been categorised as Significant. Scottish Water has identified a number of actions and DWQR accepts that these are appropriate and will be monitoring to ensure they are completed prior to signing off the incident.

