

Overview & Scrutiny Committee **2**

HOUSING AND ENVIRONMENT



Contaminated Water (Phase 2)

TASK AND FINISH GROUP

April 2009



NORTHAMPTON
BOROUGH COUNCIL

Index

Chair's Foreword	2
Executive Summary	3
Final Report including recommendations	5

APPENDICES

Appendix A	-	Scope of the Review
Appendix B	-	Drinking Water Inspectorate's report
Appendix C	-	Layout plan of Pitsford Reservoir and Works
Appendix D	-	Photographs of remedial works carried out Pitsford Works

Foreword

The Contaminated Water Task and Finish Group was established by Overview and Scrutiny Committee 2 - "Housing and Environment" in order to perform a short, focused review to hear from the public and local businesses of how they felt Anglian Water Limited responded to the recent situation of contaminated water supply in Northamptonshire.

Phase one of the Review was completed in the summer and phase two commenced in November 2008 following the publication of the Drinking Water Inspectorate's report.

Phase two of the work of the Task and Finish Group was to review the Drinking Water Inspectorate's report and it took place during November and February 2009.

Councillors from Daventry District Council, Wellingborough Borough Council and Northamptonshire County Council were involved in both phase one and phase two.

The Task and Finish Group consisted of Councillors Christopher Malpas (Chair), Dennis Meredith, Tess Scott, Pam and Paul Varnsberry and John Yates.

The Task and Finish Group met to review the Drinking Water Inspectorate's report, following which it was agreed that it should carry out a site visit of Pitsford Works to see the remedial measures that have been put in place since the summer 2008 contaminated water incident. The site visit took place on 24 February 2009.

The review of the Drinking Water Inspectorate's Report and the tour of Pitsford Works concludes the work of the Contaminated Water Task and Finish Group.



A handwritten signature in black ink, appearing to read 'Chris Malpas', written in a cursive style.

Councillor Christopher Malpas

Chair of the Contaminated Water Task and Finish Group

Acknowledgements to all those who took part in the Review: -

- Councillors Dennis Meredith, Tess Scott, Pam and Paul Varnsberry and John Yates, who sat with me on the Task and Finish Group
- Councillors Jim Bass (Wellingborough Borough Council), Chris Long (Daventry District Council) and Robin Brown (Northamptonshire County Council)
- Peter Simpson (Chief Operating Officer), Andrew Mackintosh (Head of Group Communications), Dave Marl (Site Manager) and Chris Featherstone (Regional Supply Manager), Anglian Water Limited, for allowing the Task and Finish Group to attend a site visit and giving it such a comprehensive presentation and providing evidence
- Sue Pennison (Principal Inspector), Drinking Water Inspectorate, for forwarding a copy of her report to the Task and Finish Group
- Dave Green (Environmental Health Officer) and Paul Howard (Emergency Planning Officer) for giving evidence essential to the Group

EXECUTIVE SUMMARY

This Task and Finish Group was set up to investigate the early summer 2008 contaminated water incident in Northampton and some surrounding areas.

The review was split into two phases:-

Phase One - The Task and Finish Group heard from the public and local businesses how they felt Anglian Water Ltd responded to the recent situation of contaminated water supply. The findings of the Review were forwarded to the Drinking Water Inspectorate to help inform its report. A copy has also been forwarded to Northamptonshire County Council and the Water Consumer Council.

Phase Two – The Task and Finish Group reviewed the Drinking Water Inspectorate's report and Anglian Water Ltd's report into the situation.

Following the review of the Drinking Water Inspectorate's report and the site visit to Pitsford Works the Task and Finish Group established that: -

- Prior to the summer contaminated water incident, rabbits were not known to be carriers of cryptosporidium. There are various forms of crypto.
- Anglian Water Limited regularly monitors for crypto in the water supply. Pitsford Work is categorised as a low risk site. Anglian Water Limited found out within hours of the rabbit entering the tank that there was a problem and straight away began its notification process.
- At the time of the incident one of the vents was not shrouded which was where the rabbit entered. This has now been rectified.
- Anglian Water Limited is consistently ranked at the top of industry for its water treatment.
- The Drinking Water Inspectorate acknowledged the work undertaken by the Task and Finish Group in phase one of its Review and noted its recommendations:-

“Officers, together with ward Councillors, Registered Social Landlords (RSLs) and any other interested groups and agencies, develop a register of vulnerable residents. The register should be based at Northampton Borough Council's offices and be used in circumstances such as the recent contaminated water incident.

The register of vulnerable residents should be regularly reviewed and updated.”

- The Drinking Water Inspectorate's report states that:-

“Consumers on the company's 'Watercare' register were all provided with a supply of bottled water on 25th June and continued to receive these alternate supplies for the duration of

the restrictions. I **note** that the number of consumers who received bottled water during this period reached a total of 3088 customers including 152 schools, 105 nurseries, 112 residential homes and 8 hospitals and health centres. I **recommend** that the company learns from this incident by reviewing its 'Watercare' policy consulting with local authorities and the Consumer Council for Water about ways in which customers with special needs can register with the company and this service be promoted."

- Following the review of the DWI report and the site visit, the Task and Finish Group acknowledged that Anglian Water Limited has installed sufficient remedial measures to prevent such an incident occurring in the same manner at the Pitsford Water Treatment Works.
- The review of the Drinking Water Inspectorate's Report and the tour of Pitsford Works concludes the work of the Task and Finish Group.

RECOMMENDATIONS

- 5.1 That Cabinet be informed that Anglian Water Limited has installed sufficient measures to prevent such an incident occurring in the same manner at the Pitsford Water Treatment Works.
- 5.2 A copy of the report be sent to Anglian Water Limited.

Northampton Borough Council

Overview and Scrutiny

Report of the Contaminated Water Task and Finish Group (Phase 2)

1. Purpose

- 1.1 Overview and Scrutiny Committee 2 (Housing and Environment) set up a Task and Finish Group to investigate the early summer contaminated water incident in Northampton and some surrounding areas. Representatives from Northamptonshire County Council, Daventry District Council and Wellingborough Borough Council were co-opted onto the Task and Finish Group.
- 1.2 The Task and Finish Group agreed that the following areas needed to be investigated and linked to the realisation of the council's corporate priorities:
- 1.3 **Phase One** - The Task and Finish Group heard from the public and local businesses how they felt Anglian Water Ltd responded to the recent situation of contaminated water supply. The findings of the Review has been forwarded to the Drinking Water Inspectorate to help inform its report. A copy has also been forwarded to Northamptonshire County Council and the Water Consumer Council.
- 1.4 Phase One of the Review was completed in the summer 2008.
- 1.5 **Phase Two** – The Task and Finish Group reviewed the Drinking Water Inspectorate's report and Anglian Water Ltd's report into the situation.
- 1.6 A copy of the Scope of the Review is attached at Appendix A.

2. Context and Background

- 2.1 As reported in the Contaminated Water Task and Finish Group report (Phase 1) - Northampton Borough Council's Overview and Scrutiny Committee 2 (Housing and Environment) set up a Task and Finish Group to review how Anglian Water Limited handled the recent cryptosporidium contamination. The findings of the review will be presented to Anglian Water Ltd, the Drinking Water Inspectorate, the Water Consumer Council and Northamptonshire County Council.
- 2.2 On 20 June 2008 tests found cryptosporidium in a sample from water supplies to Northampton, Daventry and surrounding villages. The parasite causes stomach upsets and the most common symptom is diarrhoea.

- 2.3 Cryptosporidium is usually spread through consumption of contaminated food or drink, or contact with infected faeces. The parasite has an incubation period of two to five days and symptoms to look out for include watery diarrhoea, stomach pain, dehydration and fever and while they usually last several days, they can continue for weeks. Elderly people or young children are at particular risk of illness, and those with immune problems may also have a more prolonged recovery time.
- 2.4 Over 80,000 households, as well as thousands of businesses, were affected in Northampton alone. Approximately 250,000 individuals were affected overall.
- 2.5 This Review provided a good medium for citizens to have their say and provide valuable information about their experience. Two public meetings were held for anyone who wanted to join the discussion, and a questionnaire was produced for those unable to attend the meetings.

2.6 Drinking Water Inspectorate's Report

- 2.6.1 The Drinking Water Inspector (DWI) published its report on 5 November 2008 on the contaminated water incident in Northamptonshire in the summer 2008.
- 2.6.2 The Task and Finish Group reviewed the DWI's report, details of which are contained in section 3 (evidence gathering) of this report.

2.7 Council's Corporate Priorities

- 2.7.1 This Review links to the Council's corporate priorities as it demonstrates further working with the community, partnership working and being citizen focussed.

3. Evidence Collection

- 3.1. In scoping Phase Two of the Review it was decided that evidence would be collected from a variety of sources:

3.2 Drinking Water Inspectorate's Report

- 3.2.1 The Drinking Water Inspectorate (DWI) published its report of the incident on 5 November 2008, a copy of which is attached at Appendix B.
- 3.2.2 The main points contained in the report: -
- An Incident Room was opened and by 05.30 am on 25th June 2008, media contacts in local and national press, radio and television were being briefed to enable public service announcements and media interviews publicising the boil water order at the earliest practicable

opportunity (from 06.00 am onwards). Supporting information was also prepared and up loaded to Anglian Water Limited's website providing confirmation of the boil water advice, detailing the affected area and giving other information including "Frequently Asked Questions and Answers" and a "list of affected parishes".

- Issuing of warning cards to individual consumer addresses began on the evening of 25th June 2008 by a contractor and the balance of addresses affected were delivered cards by Royal Mail on 26th June 2008. A 'post-code search' feature was added to Anglian Water Limited website on 26th June 2008 to help consumers wanting to verify whether they lived in the area affected by the restriction.
- Consumers on Anglian Water Limited's 'Watercare' register were all provided with a supply of bottled water on 25th June 2008 and continued to receive these alternate supplies for the duration of the restrictions. The DWI noted that the number of consumers who received bottled water during this period reached a total of 3,088 customers including 152 schools, 105 nurseries, 112 residential homes and eight hospitals and health centres. The DWI recommended that Anglian Water Limited learns from this incident by reviewing its 'Watercare' policy consulting with local authorities and the Consumer Council for Water about ways in which customers with special needs can register with Anglian Water Limited and this service be promoted.
- Anglian Water Limited adopted a twin track approach to remedial measures and, in parallel to the boil water notice, decided early on 25th June 2008 to temporarily install Ultra Violet (UV) treatment units on each of the three outlet mains at the Works. These were sourced from two UV plants in storage at other Anglian Water sites and a third UV plant was kindly made available by a neighbouring water company. These were hastily, though robustly, installed in temporary locations adjacent to each of the three outlet mains. The last of the units was commissioned on 30th June 2008. The UV dose was calculated to be sufficient to inactivate any oocysts remaining at this time in treated water leaving the Works. Anglian Water Limited's decision to install these units was a robust approach, and if the source of the *Cryptosporidium* oocysts had not been identified earlier and removed, the treatment would have provided a means of securing adequate disinfection of water prior to entering supply.
- Investigations at the Works centred on identifying the source of the *Cryptosporidium* oocysts. Attention focused on the likelihood of a site contamination event because no oocysts were evident in raw water samples around that period. Samples taken from 25th June 2008 onwards at various stages of the treatment process were all negative except for a single sample collected on 26th June 2008 from the outlet of the Granular Activated Carbon (GAC) backwash tank and a single sample on 26th June 2008 at the Disinfection Contact Tank outlet; together with repeated positive results at the final treated water

monitoring point. These results led to close scrutiny of two tanks; the Contact tank and the GAC backwash water tank. External inspections of all the process units had revealed that at the GAC backwash water tank, two of the ventilator meshes were missing and also the corner of one access hatch was slightly damaged. Both of these defects would have been sufficient to allow entry to the tank of small animals or insects. Isolation, draining down and internal inspections of the final water tanks, contact tanks and GAC backwash water tank was carried out in sequence over the period 25th and 27th June 2008. The internal inspection of the contact tank took place during the evening of 27th June 2008 and a small relatively fresh rabbit carcass was found immediately below the inlet pipe. The rabbit carcass was removed for laboratory examination. There were no other adverse findings from inspections of the other tanks. The GAC backwash tank, contact tank and treated water storage tanks were all cleaned and returned to service.

- The DWI was very critical of Anglian Water Limited for the failings in its basic water supply hygiene arrangements provisions, which this incident revealed. In particular these arrangements did not prevent small animal access because of the lack of mesh on vents and a damaged access cover, in respect of the GAC backwash water tank. These matters had not been noticed and reported for attention during the regular routine checks that Anglian Water Limited claims were in place at the Works. DWI concluded that the location of the GAC backwash water tank – it is within a secure gated compound but it is situated outside of the main secure operational Works site – contributed to the failure by personnel to recognise the tank as an operational unit requiring the same water supply hygiene arrangements and checks as all other treated water storage units.
- To prevent any recurrence at this and all other Company operational sites DWI recommends that a thorough review is undertaken throughout Anglian Water Limited's entire water supply area covering the hygiene arrangements in place for the exclusion of vermin, birds, insects and other small animals. The Review should cover every treated water storage unit and water treatment process unit where ingress has the potential to adversely affect the quality of treated water. DWI comments that it is aware that Anglian Water Limited initiated such a Review as part of its incident remedial strategy and learning process.
- The site inspection the DWI Inspector carried out on 9th July 2008 found evidence of rabbit burrows around the GAC backwash water tank at Pitsford Works – these were mostly in the area outside the main operational Works site. DWI notes that pest control inspections were routinely carried out within buildings in the main secure operational Works site. DWI recommends that Anglian Water Limited ensures that at all of its operational sites vermin control measures are not limited to critical buildings but extend to the whole site and wider environs

thereby improving the robustness of hazard identification. DWI further recommends that Anglian Water Limited reviews its Regulation 27 risk assessment methodology to ensure this hazard is both recognised and assessed and appropriate control measures and action plans are incorporated into each of its water supply system Risk Assessments, and if needs be, provide the DWI with revised Regulation 28 Reports.

- Pitsford Works was classified by Anglian Water Limited as being at low risk of having *Cryptosporidium* oocysts in the treated water in its *Cryptosporidium* risk assessments under the Water Supply (Water Quality) Regulations 2000. The formal risk assessment was carried out on 20/9/1999 and reviewed on 28/4/2006. Accordingly Anglian Water Limited was not required to carry out regulatory monitoring for *Cryptosporidium*. However, in line with Anglian Water Limited's operational monitoring strategy for surface water sites, the raw water was being regularly monitored for oocysts, and the final water was being continuously monitored using Genera cartridge filters. While *Cryptosporidium* oocysts were occasionally detected in the raw water over this time period, no oocysts had ever been detected in treated water (874 final water samples taken since 2000).
- Arrangements in place for reporting positive sample results enabled the cartridge filter in use at the Works to be removed and tested very promptly. This rapid confirmation of the initial positive sample result, which took only six hours, gave Company operational managers a solid basis on which to reach a prompt decision to protect public health by issuing a boil water notice. The DWI commended Anglian Water Limited for its monitoring strategy and laboratory reporting arrangements which identified a contamination event which otherwise may have passed unnoticed. DWI considered that these arrangements were robust and efficient and played a major part in minimising the scale of the outbreak of cryptosporidiosis in the community served by the water supply. Anglian Water Limited's sound reporting arrangements also enabled the local health protection team to put in place enhanced health surveillance proactively searching for cases of cryptosporidiosis. Without this, it is very likely that the outbreak would not have been recognised.
- It is probable that Anglian Water Limited supplied water unfit for human consumption by means of pipes leaving Pitsford Works for a short period of time commencing around 19 June 2008 contrary to Section 70 of the Water Industry Act 1991. However the DWI also consider that there is strong evidence that the for the most part Anglian Water Limited acted with due diligence before, during and after the incident to, so far as is practicable, identify and mitigate the risk of *Cryptosporidium* being present in water supplied from its Pitsford WTW. In drawing their conclusions DWI has had due regard of the fact that prior to this incident the rabbit genotype had not been recognised as a human pathogen. This being the case it was considered there are insufficient grounds for instituting proceedings under the Act.

- All sample filter cartridges for *Cryptosporidium* testing of operational samples during this incident were tested at Anglian Water Limited's laboratory at Huntingdon. The laboratory was inspected on 31st July 2008 by Inspectors. Overall the laboratory had dealt with the testing and reporting of a large number of operational *Cryptosporidium* samples speedily and effectively during the period of the incident. Some minor issues were noted however DWI concluded these were not of a nature as to have affected the validity of, or confidence in, the *Cryptosporidium* results reported.
- There were technical problems, which delayed confirmation of the genotype of the oocysts found. DWI recommends Anglian Water Limited reviews its standing arrangements for procuring typing of oocysts in circumstances where this information is of potential importance to public health. DWI is critical of Anglian Water Limited for not sending oocysts at the outset to the UK *Cryptosporidium* Reference Unit, NPHS, Swansea, which is the recognised national centre for this work. Although the rabbit carcass was found quickly in this incident, if the circumstances had been different, typing of oocysts may have been the only early clue to guide incident investigations as to the source of the oocysts and therefore the appropriate remedial measures.
- Overall the speed of reporting and large numbers of samples handled by the Anglian Water laboratory during the incident period was commendable and a credit to the laboratory personnel involved.
- After removal of the rabbit carcass and completion of tank cleaning operations at the Works, all samples collected after 26th June were free from oocysts at the final treated water monitoring point at the Works. With the ultra violet treatment (UV) also in place on all three-outlet mains by 30th June 2008, Anglian Water Limited focused its remediation efforts on the phased cleaning of service reservoirs and water towers followed by flushing of local distributions mains with the aim of progressively removing any oocysts potentially remaining in the distribution system. As this cleaning and flushing work progressed; a steady reduction in oocysts numbers were evidenced in samples collected from service reservoirs, water towers and consumer tap samples.
- By 4th July 2008 the sampling results and remediation status reports showed that the water supply was generally free of oocysts with remediation and ongoing sampling confined to just a few locations. With the agreement of the Incident Management Team (IMT) water use restrictions were lifted; press releases were issued the same day and the printed notices sent out by post that day confirmed this in writing to all consumers resident in the affected area.
- The IMT comprised representatives from East Midlands South Health Protection Unit of the Health Protection Agency (HPA), Northampton

Borough Council, South Northamptonshire District Council, Borough Council of Wellingborough, Daventry District Council, Northamptonshire Primary Care Trust, together with others from the Health Protection Agency, the UK Cryptosporidium Reference Unit and Anglian Water Limited. The IMT first met on 25th June 2008 and met regularly thereafter throughout the incident. Anglian Water Limited took an active part, and cooperated fully with the IMT by providing information on water quality sampling results and sharing water supply operational status information. There was an enhanced level of health monitoring and reporting carried out by health professionals in the affected area.

- The IMT agreed after deliberation at its meeting on 4th July 2008 that its conditions for the lifting of the boil water restrictions in all areas had broadly been met. Continued enhanced water monitoring by Anglian Water Limited was agreed and the final IMT meeting was held on 31st July.
- A total of 22 cases of confirmed cryptosporidiosis caused by infection with the rabbit genotype were identified by that date in patients presenting with symptoms to their general practitioner. All but one case had a home address in water supply area served by Pitsford Works.
- Anglian Water Limited first notified East Midlands South Health Protection Unit, Northampton Borough Council, South Northamptonshire District Council, Borough Council of Wellingborough, Daventry District Council, and Consumer Council for Water of this incident on 25th June 2008. DWI concluded that Anglian Water Limited met the requirements of Section 35(8) of the Water Supply (Water Quality) Regulations 2000. Although not a regulatory requirement, Anglian Water Limited also notified the British Soft Drinks Association and the Chilled Food Association who were kept updated during the incident.
- Anglian Water Limited fully met the notification and reporting requirements of Section 7 of the Water Undertakers (Information) Direction 2004.
- DWI considered Anglian Water Limited acted commendably in the way it identified the contamination event promptly and acted robustly to safeguard public health. Anglian Water Limited also acted very positively and openly in communicating with other parties responsible for working collectively to safeguard public health.
- The efforts made by Anglian Water Limited through maintaining a visible local presence to support consumers for the duration of the incident, and in providing support to the media and other stakeholders, meant that for the most part, and from the outset, the information available to consumers was accurate and timely; notwithstanding the fact that in any large scale incident the disruption of water restrictions is

always alarming and inconvenient. The unusual cause of this incident did create some unique communication difficulties, from the outset the media and other parties were keen to propagate hypotheses based on information available on the internet about historic water supply incidents and their causes, none of which were relevant to this incident but nonetheless had to be addressed in order to maintain public confidence. Anglian Water Limited organised or attended a number of meetings with local politicians, businesses and other affected parties which all proved helpful. DWI recommends that Anglian Water Limited jointly evaluate the role of such opinion surveys in the context of a water supply incident with the Consumer Council for Water.

- The level of cooperation by Anglian Water Limited with the DWI was generally first class; there were two lapses, which had the effect of impeding the DWI's investigation of the incident. At the inspection of the Pitsford Works on 9th July 2008 the DWI Inspector was not permitted to inspect the underside of the GAC backwash water tank hatches: also the Inspector's request to view photographic evidence of the rabbit carcass in-situ in the contact tank was initially turned down and only complied with on 31st July 2008. DWI recommends that Anglian Water Limited ensures that all its personnel are briefed on the powers granted to Inspectors appointed under the Water Industry Act 1991 and the penalties that exist for impeding an inspector in the course of carrying out investigations.

3.2.3 Review of DWI's Report

3.2.4 On 18 November 2008, the Task and Finish Group met to review the DWI's report.

3.2.5 The Task and Finish Group's key findings: -

- The equipment at Pitsford Reservoir should be checked regularly. The monitoring process did not appear to be rigorous enough.
- DWI's Report recommends that a thorough Review be undertaken throughout the Company's entire water supply area covering the hygiene arrangements in place for the exclusion of vermin, birds, insects and other small animals. The Review should cover every treated water storage unit and water treatment process unit where ingress had the potential to adversely affect the quality of treated water. DWI requested that Anglian Water Limited provide it with a summary report, by 30th November 2008, on the review work together with a detailed site by site listing of the findings, and deficiencies found and remedial actions taken or pending.
- Ultraviolet (UV) equipment is very expensive to run. It was emphasised that Pitsford Reservoir is classed as a low risk site and is continually monitored.
- A site visit should be arranged to Pitsford to check the measures that

are in place and to see where the problem occurred on the site.

- Bottled water was delivered successfully to the vulnerable people although not everyone was aware of the WaterCare Register.
- The Vulnerable People's List is a list that is kept and used for all emergencies.
- When a problem arises such as the Cryptosporidium incident the Data Protection Act does not apply. Within the Act, it is stated that the sharing of information is permitted. Secondary Legislation states that in an emergency there is a need to share information and for Agencies to co-operate. This incident fits the criteria of an emergency and there is the need for Agencies and Organisations who hold such data to have a combined list of vulnerable people / voluntary groups.

3.2.6 Site Visit to Pitsford Works

3.2.7 On 24 February 2009, the Task and Finish Group visited Pitsford Works to check the measures that are in place and to see where the problem occurred on the site.

3.2.8 The visit commenced with a comprehensive presentation given by Anglian Water Limited's representatives of how water is treated and the reason for the contaminated water incident in the summer. Attached at Appendix C is a plan detailing the layout of the Pitsford Reservoir and Works.

Main Points from the Presentation

3.2.9 Pitsford Reservoir and Works were constructed around fifty years ago and has around 12-18 months water supply. At the time the investment cost in the region of £0.5million.

3.2.10 Reservoir

3.2.11 The water is of a steady, stable quality.

3.2.12 The area around Pitsford Reservoir is very flat and rivers are slow moving. Water Treatment Works located in hilly areas would have a different treatment approach.

3.2.13 There are nitrate run-offs and natural removal of these takes place in the reservoir. Run offs usually take place during the autumn. Anglian Water Limited is selective of the water that it pumps from the neighbouring river. The Company does not need to test for nitrate at this works as the levels are kept sufficiently low in the reservoir.

3.2.14 Most of the fill to the Reservoir is natural. Once it is full, excess water falls down the spill way.

3.2.15 Dialogue takes place with the Environment Agency regarding flooding. In the past, the water level of the Reservoir was maintained a slightly lower level.

3.2.16 Around 40,000,000 litres of water pass through the water treatment works per day, which equates to 463 litres of water per second.

3.2.17 Pumping Stations

3.2.18 The pumping stations pump raw water to the head of the works. On occasions fresh water mussels are present in the pipes, which can restrict the pipe width. Periodically, a chlorine treatment is applied to remove the mussels.

3.2.19 Pre Ozone Treatment Stage

3.2.20 The first water treatment stage is pre ozone. Ozone is generated from air, and is designed to break down organics.

3.2.21 Historically, there can be problems with algae breakdown products during the summer months. Pre ozone treatment prevents this and also removes any pesticides present in the water.

3.2.22 Anglian Water Limited also monitors the type of pesticides being used agriculturally in the area.

3.2.23 Should Water Companies experience a problem with pesticides and herbicides present in the water they work closely with the Environment Agency on catchment control.

3.2.24 Much combined research into this is undertaken in the water industry, but each water company is accountable for meeting quality standards.

3.2.25 Clarifiers

3.2.26 The clarifying water treatment stage is designed to remove fine solids in the water. Ferric sulphate, lime and polyelectrolyte are the three chemicals used to coagulate the solids and remove them as sludge.

3.2.27 ASG Filters

3.2.28 Three layers of filter are installed that are designed to remove any remaining matter in the water, such as soil particles, crypto etc. This is a very effective barrier. Water leaves the ASG filtering level in a crystal clear format.

3.2.29 The combined clarification and filtration stages are those, which remove very small particles such as Cryptosporidium oocysts.

3.2.30 Re-Lift Pumps

3.2.31 This stage of water treatment removes dissolvers such as pesticides.

3.2.32 Post Ozone Level

3.2.33 The Post Ozone water treatment level removes any breakdown from organisms such as algae and agricultural pesticides.

3.2.34 GAC Filtration

3.2.35 The GAC Filtration stage is towards the end of the water treatment process. The GAC backwash tank provides clean water for backwashing the GAC filters.

3.2.36 Contact Tank

3.2.37 Chlorine is added to the water in the contact tank at a high level to disinfect the water. Crypto is very resistant to chlorine and ozone at the levels used. Chlorine is very effective at killing bacteria.

3.2.38 The water is maintained in the contact tank for at least one hour at the very high chlorine level, the chlorine level is then reduced.

3.2.39 The water quality is continually monitored, and samples are also taken for laboratory analysis.

3.2.41 Treated Water Storage

3.2.42 Water is then pumped from the Treated Water Storage via three pumps to Northampton, Brixworth area and locations from Harpole towards Daventry.

3.2.43 The UV treatment units that were installed at this stage when the crypto incident occurred in the summer 2008 are no longer used but one remains in situ but is turned off. Once the GAC backwash tank had been secured and all tanks cleaned there was no further need for the UV treatment units which have now left site, except one which remains for testing.

3.2.44 Tour of Pitsford Works

3.2.45 Following the presentation, the Task and Finish Group was given a guided tour of the site.

3.2.46 The newly installed covers for the vents on the GAC Backwash Tank were seen, photographs of which are attached at Appendix D.

4. Conclusions

- 4.1 Prior to the summer contaminated water incident, rabbits were not known to be carriers of crypto. There are various forms of cryptosporidium.
- 4.2 Anglian Water Limited regularly monitors for crypto in the water supply. Pitsford Work is categorised as a low risk site. Anglian Water Limited found out within hours of the rabbit entering the tank that there was a problem and straight away began its notification process.
- 4.3 At the time of the incident one of the vents was not shrouded which was where the rabbit entered. This has now been rectified.
- 4.4 Anglian Water Limited is consistently ranked at the top of industry for its water treatment.
- 4.5 The Drinking Water Inspectorate acknowledged the work undertaken by the Task and Finish Group in phase one of its Review and noted its recommendations: -

“Officers, together with ward Councillors, Registered Social Landlords (RSLs) and any other interested groups and agencies, develop a register of vulnerable residents. The register should be based at Northampton Borough Council’s offices and be used in circumstances such as the recent contaminated water incident.

The register of vulnerable residents should be regularly reviewed and updated.”

The Drinking Water Inspectorate’s report states that: -

“Consumers on the company’s ‘Watercare’ register were all provided with a supply of bottled water on 25th June and continued to receive these alternate supplies for the duration of the restrictions. I **note** that the number of consumers who received bottled water during this period reached a total of 3088 customers including 152 schools, 105 nurseries, 112 residential homes and 8 hospitals and health centres. I **recommend** that the company learns from this incident by reviewing its ‘Watercare’ policy consulting with local authorities and the Consumer Council for Water about ways in which customers with special needs can register with the company and this service be promoted.”

4.5 Following the review of the DWI report and the site visit, the Task and Finish Group acknowledged that Anglian Water Limited has installed sufficient remedial measures to prevent such an incident occurring in the same manner at the Pitsford Water Treatment Works.

4.6 The review of the Drinking Water Inspectorate's Report and the tour of Pitsford Works concludes the work of the Task and Finish Group.

5 Recommendations

5.1 That Cabinet be informed that Anglian Water Limited has installed sufficient measures to prevent such an incident occurring in the same manner at the Pitsford Water Treatment Works.

5.2 A copy of the report be sent to Anglian Water Limited.

Appendices

Northampton Borough Council Overview and Scrutiny

Appendix A



Overview and Scrutiny Task and Finish Group Project Proposal

1. Proposal by: **Overview and Scrutiny Committee 2 (Housing and Environment)**
2. Proposed name of Task and Finish Group: **Contaminated Water Task and Finish Group**
3. Parent Scrutiny Committee: **Overview and Scrutiny Committee 2 (Housing and Environment)**
4. Description of proposed project:
 - **Phase 1 - Opportunity for the public to provide details of how they felt Anglian Water responded to the situation**
 - **Phase 2 – To be scoped following production of the Drinking Water Inspectorate’s report and Anglian Water’s investigation report into the situation**
5. Proposed outcomes of project:
 - **Should the Drinking Water Inspectorate/Anglian Water undertake a public inquiry into the situation, Overview and Scrutiny’s evidence will inform that inquiry**
6. External organisation involvement:
 - **Other neighbouring Local Authorities**
 - **Drinking Water Inspectorate**
 - **Anglian Water Limited**
7. Departmental Officer support:
 - **Environmental Health Officer**
 - **Health and Safety Officer**
 - **Emergency Planning Officer**

www.northampton.gov.uk/scrutiny

Call 01604 837046 or 01604 837408

E-mail: scrutiny@northampton.gov.uk

Northampton Borough Council Overview and Scrutiny

8. Overview and Scrutiny Advisor:

- **Tracy Tiff, Overview and Scrutiny Officer**

Proposal checklist

Why review this issue?

Council viewpoint

Criteria	Response
The Council views the issue as a priority	Yes
The item is in the Councils forward plan	No
At least one councillor regards the issue as a key issue	Yes
The matter has been raised with councillors and is considered worth investigating	Yes
A high level of funding is committed by the council to the subject	No
There is a pattern of overspending in the area	N/A
There is a pattern of under spending in the area	N/A
The issue has been referred for further investigation by a Council Committee	No

Community Viewpoint

Criteria	Response
The issue has been raised in a meeting with the community	Yes
There have been high levels of complaint	Concerns have been raised rather than complaints
There has been high levels of praise	Yes
Media attention has highlighted an of public interest or concern	Yes

www.northampton.gov.uk/scrutiny

Call 01604 837046 or 01604 837408

E-mail: scrutiny@northampton.gov.uk

Northampton Borough Council Overview and Scrutiny

Performance

Criteria	Response
The performance indicators show poor performance	N/A
The performance indicators show strong performance	N/A
The area will be the subject of a major performance review and members would like to have an early input	N/A
External Auditors or inspectors have raised the issue (adversely or otherwise)	N/A

Relevant National Issues

Criteria	Response
Central Government is planning to address the issue	Yes
The issue has been subject to recent Government guidance or legislation	No
Members may wish to know if the authority is able to deal with a national issue which is receiving national media attention	Yes

What would the review involve?

Factor	Comments
What are the resources likely to be required?	Venue, Departmental Officers, Overview and Scrutiny Officer, consultation and publicity
What time scale is likely to be required for the review?	Initially two meetings, then held in abeyance until the publication of the Drinking Water Inspectorate's report
What are the main risks and uncertainties involved in the resourcing and timescale factors?	Size of venue required for the event. Resourcing issues, in particular

www.northampton.gov.uk/scrutiny

Call 01604 837046 or 01604 837408

E-mail: scrutiny@northampton.gov.uk

Northampton Borough Council Overview and Scrutiny

	other urgent issues that may come forward for Overview and Scrutiny to investigate
Which research methods are most appropriate?	Facility for on-line comments, questionnaire, written evidence, public meeting
Who are the stakeholders that we need to engage?	General public and local businesses
What input will be needed from experts or professional advisors?	Environmental Health Officer Emergency Planning Officer Health and Safety Team Leader
What equality and community cohesion issues do we need to initially consider?	Engagement with 'hard to reach' and vulnerable groups. Questionnaire to be translated in the 6-7 languages common to Northampton. Questionnaire to be sent to the voluntary sector and disabled people's forum members
Task and Finish Group membership	Councillor Christopher Malpas (Chair) Councillors Pam Varnsberry, Tess Scott, Dennis Meredith and either David Garlick or Paul Varnsberry

www.northampton.gov.uk/scrutiny

Call 01604 837046 or 01604 837408

E-mail: scrutiny@northampton.gov.uk



Appendix B

DRINKING WATER INSPECTORATE

Room M04, 55 Whitehall
London SW1A 2EY

Direct Line: 020 7270 3394
Enquiries: 020 7270 3370
Facsimile: 020 7270 3177

E-mail: sue.pennison@defra.gsi.gov.uk
DWI Website: <http://www.dwi.gov.uk>

[guardians of drinking water quality](#)

5th November 2008

Dear Councillor Malpas

Anglian Water - Pitsford Water Treatment Works - Cryptosporidium

I am writing to provide you with a copy of the outcome of our investigation into the circumstances leading to the detection of the parasite, *Cryptosporidium*, in the water supplies to consumers in the Northampton and Daventry area in June 2008.

The Inspectorate has now concluded its investigation and following established procedure, has written an Incident Assessment Letter to Anglian Water detailing the findings of its investigation, and the recommendations arising. This letter is attached (see Appendix 1).

In completing our assessment, the inspectorate considered the information brought to its attention by yourselves via the scrutiny committee and by your provision of information from your survey for which we thank you. The main concern relating to the "Watercare" register are predominantly covered in paragraph 3.3.

We hope that you find the attached Incident Assessment Letter informative and useful, please do not hesitate to contact me if you have any queries regarding the content.

I understand that you were hoping to carry out a further piece of work following our conclusion of the investigation and I would be grateful if you felt able to keep us informed of the scope and outcome of the work.

Yours sincerely

A handwritten signature in black ink that reads 'S Pennison'. The signature is written in a cursive style and is underlined with a single horizontal line.

Sue Pennison
Principal Inspector

Appendix 1 : Incident Assessment Letter



guardians of drinking water quality

DRINKING WATER INSPECTORATE
Room M07, 55 Whitehall
London SW1A 2EY

Direct Line: 020 7270 3380
Enquiries: 020 7270 3370
Facsimile: 020 7270 3177

E-mail: peter.halton@defra.gsi.gov.uk
DWI Website: <http://www.dwi.gov.uk>

4th November 2008

Mr P Simpson
Chief Operating Officer
Anglian Water Services Ltd
Anglian House
Ambury Road
Huntingdon
Cambs PE29 3NZ

DWI ref: DWI/33/10/2008-1848

Your ref: AW 2008/908

Dear Mr Simpson

Drinking Water Quality Incident : Pitsford Water Treatment Works – Boil Water Advice following detection of *Cryptosporidium*

1 Introduction

- 1.1 The purpose of this letter is to inform you of the conclusions and recommendations arising from the Inspectorate's assessment of the incident involving the detection of *Cryptosporidium* in water leaving Pitsford Water Treatment Works on 24th June 2007 and the subsequent issue of Boil Water Advice to consumers in the Northampton and Daventry area supplied by this works.
- 1.2 When notified of an incident, the Inspectorate assesses the Company's reports and investigates the way in which the incident was handled and whether any statutory requirements were contravened. The Company notified the Inspectorate of this incident on 25th June 2008. I have assessed all the relevant information submitted by the Company and by others and set out my conclusions and recommendations below.

2 Overview of the Incident

- 2.1 Pitsford Water Treatment Works is located to the north of the town of Northampton in Northamptonshire. Raw water from the Pitsford Reservoir receives advanced treatment comprising pre-ozonation, clarification, filtration, ozonation, granular activated carbon (GAC) adsorption, chlorination and phosphate dosing for plumbosolvency control. Treated water is distributed to consumers by three large diameter outlet mains serving thirteen service reservoirs and water towers. The Works serves an estimated 108,526 properties (approximately 258,000 population) and the supply in total serves six water supply zones: Brixworth, Northampton (four zones) and Daventry.

- 2.2 In accordance with the company's risk based operational monitoring strategy for surface water abstraction sites continuous monitoring of the final treated water for *Cryptosporidium* oocysts was in place based on a cartridge filter being in situ for approximately 4 days at a time. During the early evening of 24th June the company's laboratory at Huntingdon reported that analysis of a *Cryptosporidium* filter cartridge in use between 09.29hrs on 19th June and 11.50hrs on 23rd June contained 6 *Cryptosporidium* oocysts in 11,848 litres of treated water (equivalent to 0.0005 oocysts per litre). This was a highly unusual result for the Works. The action taken was to immediately remove and test the next sample filter cartridge and this was done at 20.00 hrs on 24th June. The result for this second cartridge was reported by the laboratory during the early hours of 25th June as containing 418 oocysts in 5,064 litres (equivalent to 0.08 oocysts per litre).
- 2.3 The finding of two successive positive samples was reported immediately to senior management. A Company Incident Team was set up and by 03.30hrs on 25th June the decision had been taken to issue a boil water order to consumers receiving supplies from this Works. This public health precaution remained in place until 14.00hrs on 4th July 2008.

3 Actions taken by the Company

- 3.1 An Incident Room was opened and by 05.30 hrs on 25th June, media contacts in local and national press, radio and television were being briefed to enable public service announcements and media interviews publicising the boil water order at the earliest practicable opportunity (from 06.00 hrs onwards). Supporting information was also prepared and up loaded to the company's website providing confirmation of the boil water advice, detailing the affected area and giving other information including "Frequently Asked Questions and Answers" and a "list of affected parishes".
- 3.2 The issue of warning cards to individual consumer addresses began on the evening of 25th June by a contractor and the balance of addresses affected were delivered cards by Royal Mail on 26th June. A 'post-code search' feature was added to the Company website on 26th June to help consumers wanting to verify whether they lived in the area affected by the restriction.
- 3.3 Consumers on the company's 'Watercare' register were all provided with a supply of bottled water on 25th June and continued to receive these alternate supplies for the duration of the restrictions. I **note** that the number of consumers who received bottled water during this period reached a total of 3088 customers including 152 schools, 105 nurseries, 112 residential homes and 8 hospitals and health centres. I **recommend** that the company learns from this incident by reviewing its 'Watercare'

policy consulting with local authorities and the Consumer Council for Water about ways in which customers with special needs can register with the company and this service be promoted.

- 3.4 Mobile 'Customer Support' Units were deployed by the Company to provide customers with a local presence and source of information. One unit was deployed to Market Place, Northampton on 26th June, and a second unit to

Daventry town centre on 27th June. These units were in place and manned until after water use restrictions were lifted.

- 3.5 Extensive sampling was undertaken daily throughout the incident both within the Works and at service reservoirs, water towers and consumer taps. These sample results showed that by the time *Cryptosporidium* oocysts were detected at the works they were also present in water within service reservoirs and water towers. Consumer tap sampling began on 26th June and this confirmed that the oocyst contamination had extended beyond these locations into the local mains distribution networks in each of the zones served by the Works. Sampling was maintained at an enhanced level to support the company's remedial strategy to restore supplies to normal. In total 342 cryptosporidium samples were tested over a twelve day period.

3.6 Additional water treatment provision.

- 3.6.1 The Company adopted a twin track approach to remedial measures and, in parallel to the boil water notice, decided early on 25th June to temporarily install Ultra Violet (UV) treatment units on each of the three outlet mains at the Works. These were sourced from two UV plants in storage at other Anglian Water sites and a third UV plant was kindly made available by a neighbouring water company. These were hastily, though robustly, installed in temporary locations adjacent to each of the three outlet mains. The last of the units was commissioned on 30th June. The UV dose was calculated to be sufficient to inactivate any oocysts remaining at this time in treated water leaving the Works. The Company's decision to install these units was a robust approach, and if the source of the *Cryptosporidium* oocysts had not been identified earlier and removed, the treatment would have provided a means of securing adequate disinfection of water prior to entering supply.

3.7 Investigations at the Water Treatment Works

- 3.7.1 Investigations at the Works centred on identifying the source of the *Cryptosporidium* oocysts. Attention focused on the likelihood of a site contamination event because no oocysts were evident in raw water samples around that period. Samples taken from 25th June onwards at various stages of the treatment process were all negative except for a single sample collected on 26th June from the outlet of the Granular Activated Carbon (GAC) backwash tank and a single sample on 26th June at the Disinfection Contact Tank outlet; together with repeated positive results at the final treated water monitoring point. These results

led to close scrutiny of two tanks; the Contact tank and the GAC backwash water tank. External inspections of all the process units had revealed that at the GAC backwash water tank, two of the ventilator meshes were missing and also the corner of one access hatch was slightly damaged. Both of these defects would have been sufficient to allow entry to the tank of small animals or insects. Isolation, draining down and internal inspections of the final water tanks, contact tanks and GAC backwash water tank was carried out in sequence over the period 25th and 27th June. The internal inspection of the contact tank took place during the evening of 27th June and a small relatively fresh rabbit carcass was found immediately below the inlet pipe. The rabbit carcass was removed for laboratory examination. There were no other

adverse findings from inspections of the other tanks. The GAC backwash tank, contact tank and treated water storage tanks were all cleaned and returned to service.

3.7.2 The GAC adsorber units at the Works are arranged to allow backwash water to be drawn by gravity from a dedicated GAC backwash water tank located within the site boundary. This tank is supplied by a pump from the common outlet main of the GAC adsorber units. The GAC media in the adsorbers is supported on a wedge-wires having a 250 micron aperture, with backwash water arranged for upwards flow. The supposition that a rabbit had entered the GAC backwash water tank through a defective ventilator or damaged access cover had credence: any animal entering at that location would have been held on the wedge-wire GAC media support during a backwash cycle and then carried forward into the next downstream tank which was the disinfection contact tank – the rabbit carcass was found immediately below the contact tank inlet pipe. Following my site inspection, I **concur** with the Company that this appears to be the sole credible technical explanation for the occurrence of oocysts at the particular locations identified by the company's comprehensive works inspection and sampling.

3.7.3 I am **very critical** of the company for the failings in its basic water supply hygiene arrangements provisions which this incident revealed. In particular these arrangements did not prevent small animal access because of the lack of mesh on vents and a damaged access cover, in respect of the GAC backwash water tank. These matters had not been noticed and reported for attention during the regular routine checks that the Company claims were in place at the Works. I **conclude** that the location of the GAC backwash water tank – it is within a secure gated compound but it is situated outside of the main secure operational Works site – contributed to the failure by personnel to recognise the tank as an operational unit requiring the same water supply hygiene arrangements and checks as all other treated water storage units. The importance and need for close attention to be paid to identifying and rectifying defects that might permit animal access has been documented widely and repeatedly as an essential element of best practice e.g. all the various editions of the Water Industry's 'Operational Guidelines for the Protection

of Drinking Water Supplies' and successor documents produced over many decades.

3.7.4 To prevent any recurrence at this and all other Company operational sites I **recommend** that a thorough review is undertaken throughout the company's entire water supply area covering the hygiene arrangements in place for the exclusion of vermin, birds, insects and other small animals. The review should cover every treated water storage unit and water treatment process unit where ingress has the potential to adversely affect the quality of treated water. I am aware that the company initiated such a review as part of its incident remedial strategy and learning process. Accordingly I would be grateful if the company could provide me by 30th November 2008 with a summary report on the review work together with a detailed site by site listing of the findings, any deficiencies found and remedial actions taken or pending.

3.7.5 The site inspection I carried out with Inspector Dr Steven Lambert on 9th July found evidence of rabbit burrows around the GAC backwash water tank at Pitsford Works – these were mostly in the area outside the main operational Works site. I note that pest control inspections were routinely carried out within buildings in the main secure operational Works site. I **recommend** that the Company ensures that at all of its operational sites vermin control measures are not limited to critical buildings but extend to the whole site and wider environs thereby improving the robustness of hazard identification. I **further recommend** that the company reviews its Regulation 27 risk assessment methodology to ensure this hazard is both recognised and assessed and appropriate control measures and action plans are incorporated into each of its water supply system Risk Assessments, and if needs be, provide the DWI with revised Regulation 28 Reports.

3.7.6 I was minded to **recommend** that the Company replace the access hatches and ventilators on the GAC backwash water tank at Pitsford Works to improve security and unwanted ingress at the Works, however, I am satisfied that the Company has already completed these improvements.

3.8 Cryptosporidium monitoring strategy

3.8.1 Pitsford Works was classified by the company as being at low risk of having *Cryptosporidium* oocysts in the treated water in their *Cryptosporidium* risk assessments under the Water Supply (Water Quality) Regulations 2000. The formal risk assessment was carried out on 20/9/1999 and reviewed on 28/4/2006. Accordingly the company was not required to carry out regulatory monitoring for *Cryptosporidium*. However, in line with the company's operational monitoring strategy for surface water sites, the raw water was being regularly monitored for oocysts, and the final water was being continuously monitored using Genera cartridge filters. While *Cryptosporidium* oocysts were occasionally detected in the raw water over this time period, no oocysts

had ever been detected in treated water (874 final water samples taken since 2000).

3.8.2 Arrangements in place for reporting positive sample results enabled the cartridge filter in use at the Works to be removed and tested very promptly. This rapid confirmation of the initial positive sample result which took only six hours gave Company operational managers a solid basis on which to reach a prompt decision to protect public health by issuing a boil water notice. I **commend** the Company for its monitoring strategy and laboratory reporting arrangements which identified a contamination event which otherwise may have passed unnoticed. I consider that these arrangements were robust and efficient and played a major part in minimising the scale of the outbreak of cryptosporidiosis in the community served by the water supply. The company's sound reporting arrangements also enabled the local health protection team to put in place enhanced health surveillance proactively searching for cases of cryptosporidiosis. Without this, it is very likely that the outbreak would not have been recognised.

3.9 Cryptosporidium analysis and reporting

3.9.1 All sample filter cartridges for *Cryptosporidium* testing of operational samples during this incident were tested at the company's laboratory at Huntingdon. The laboratory was inspected on 31st July 2008 by Inspectors Sharon Evans and Shaun Jones. Overall the laboratory had dealt with the testing and reporting of a large number of operational *Cryptosporidium* samples speedily and effectively during the period of the incident. Some minor issues were noted however I **conclude** these were not of a nature as to have affected the validity of, or confidence in, the *Cryptosporidium* results reported.

3.9.2 However there were technical problems which delayed confirmation of the genotype of the oocysts found. I **recommend** the Company reviews its standing arrangements for procuring typing of oocysts in circumstances where this information is of potential importance to public health. I am **critical** of the company for not sending oocysts at the outset to the UK Cryptosporidium Reference Unit, NPHS, Swansea which is the recognised national centre for this work. Although the rabbit carcass was found quickly in this incident, if the circumstances had been different, typing of oocysts may have been the only early clue to guide incident investigations as to the source of the oocysts and therefore the appropriate remedial measures.

3.9.3 Overall the speed of reporting and large numbers of samples handled by the Anglian Water laboratory during the incident period was **commendable** and a credit to the laboratory personnel involved.

3.10 Remediation of the Distribution System & Service Reservoirs.

3.10.1 After removal of the rabbit carcass and completion of tank cleaning operations at the Works, all samples collected after 26th June were free from oocysts at the final treated water monitoring point at the Works. With the ultra violet treatment (UV) also in place on all three outlet mains by 30th June, the Company focused its remediation efforts on the phased cleaning of service reservoirs and water towers followed by flushing of local distributions mains with the aim of progressively removing any oocysts potentially remaining in the distribution system. As this cleaning and flushing work progressed; a steady reduction in oocysts numbers were evidenced in samples collected from service reservoirs, water towers and consumer tap samples.

3.10.2 By 4th July the sampling results and remediation status reports showed that the water supply was generally free of oocysts with remediation and ongoing sampling confined to just a few locations. With the agreement of the Incident Management Team (IMT) water use restrictions were lifted; press releases were issued the same day and the printed notices sent out by post that day confirmed this in writing to all consumers resident in the affected area.

3.11 The IMT comprised representatives from East Midlands South Health Protection Unit of the Health Protection Agency (HPA), South Northamptonshire District Council, Borough Council of Wellingborough, Daventry District Council, Northamptonshire Primary Care Trust, together with

others from the Health Protection Agency, the UK Cryptosporidium Reference Unit and Anglian Water. The IMT first met on 25th June and met regularly thereafter throughout the incident. The Company took an active part, and cooperated fully with the IMT by providing information on water quality sampling results and sharing water supply operational status information. There was an enhanced level of health monitoring and reporting carried out by health professionals in the affected area.

3.12 The IMT agreed after deliberation at their meeting on 4th July that their conditions for the lifting of the boil water restrictions in all areas had broadly been met. Continued enhanced water monitoring by the company was agreed and the final IMT meeting was held on 31st July. A total of 22 cases of confirmed cryptosporidiosis caused by infection with the rabbit genotype were identified by that date in patients presenting with symptoms to their general practitioner. All but one case had a home address in water supply area served by Pitsford Works.

4 Notification

4.1 The Company first notified East Midlands South Health Protection Unit, South Northamptonshire District Council, Borough Council of Wellingborough, Daventry District Council, and Consumer Council for Water of this incident on 25th June 2008. I therefore conclude that the Company met the requirements of Section 35(8) of the Water Supply (Water Quality) Regulations 2000. Although not a regulatory requirement, the company also notified the British Soft Drinks

Association and the Chilled Food Association who were kept updated during the incident.

- 4.2 The Inspectorate was also notified on 25th June 2008, and the Company submitted initial, interim and final reports by the agreed dates. The Company opened up 24 hour senior and working level lines of communication with DWI which was very helpful in support of advising ministers, officials and other regulators. I therefore **conclude** that the Company fully met the notification and reporting requirements of Section 7 of the Water Undertakers (Information) Direction 2004.

5 Water unfit for human consumption

- 5.1 There were 22 confirmed primary cases of cryptosporidiosis infection due to the rabbit genotype in the community which comprised a population of around 258,000: all but one of these cases had a home address within the area supplied with water from the Pitsford Works. Water samples taken at a number of consumers' taps within the affected zones during the incident contained *Cryptosporidium* but these oocysts were not typed therefore there is no conclusive scientific evidence to link these findings directly to the rabbit contamination incident at Pitsford Works. However, the UK Cryptosporidium Reference Laboratory has typed oocysts obtained from 7 water samples from the distribution system, the rabbit carcass and from stool specimens from 9 of the cases and reported these as all belonging to the same rabbit genotype. On the basis of this work, the UK Cryptosporidium Reference Laboratory together with IMT and other colleagues have submitted a paper for publication in the academic literature drawing to the attention of the public health community that this genotype should be regarded now as a human pathogen. I have reviewed the approximate locations of the home addresses of the cases in relation to the water sampling results and the engineering of the water distribution arrangements. I have looked at this data in respect of its spatial and temporal distribution. In particular I have considered whether the date of onset of symptoms for each case and the water sample locations/results are broadly consistent with the hypothesis that a finite and sufficient number of viable oocysts originating from the rabbit carcass found in the contact tank at the Works travelled through the relatively complex and large water distribution system to reach the taps of the consumers occasioning their exposure by means of consumption of tap water. I could find no strong scientific or engineering evidence to refute this hypothesis.
- 5.2 In summary I **conclude** that it is probable that the company supplied water unfit for human consumption by means of pipes leaving Pitsford Works for a short period of time commencing around 19 June 2008 contrary to Section 70 of the Water Industry Act 1991. However I also consider that there is strong evidence that for the most part the Company acted with due diligence before, during and after the incident to, so far as is practicable, identify and mitigate the risk of *Cryptosporidium* being present in water supplied from its Pitsford WTW. In drawing my conclusions I have had due regard of the fact that prior to this incident the rabbit genotype had not been recognised as a human

pathogen. This being the case I **consider** there are insufficient grounds for instituting proceedings under the Act.

- 5.3 I have considered whether the circumstances of this incident point to a breach by the company of the Water Supply (Water Quality) Regulations 2000 (Amendment) Regulations 2007. In particular I have considered the evidence in relation to Regulation 26 (water treatment) and Regulation 28 (Risk Assessment). I am satisfied that this incident did not arise as a consequence of any deficiency in the design or operation of the treatment processes at Pitsford Works. I am also satisfied that the company's risk assessment in place before the incident was appropriate and consistent with knowledge pertaining to this hazard at that time and I have noted elsewhere that the company's risk assessment was supported by a comprehensive monitoring strategy.

6 Other Matters

- 6.1 I **consider** the Company acted commendably in the way it identified the contamination event promptly and acted robustly to safeguard public health. The Company also acted very positively and openly in communicating with other parties responsible for working collectively to safeguard public health. I base this opinion on responses given to the DWI by the four relevant Local Authorities and the East Midlands South Health Protection Unit of the Health Protection Agency who comprised the IMT.
- 6.2 The efforts made by the company through maintaining a visible local presence to support consumers for the duration of the incident, and in providing support to the media and other stakeholders, meant that for the most part, and from the outset, the information available to consumers was accurate and timely; notwithstanding the fact that in any large scale incident the disruption of water restrictions is always alarming and inconvenient. The unusual cause of this

incident did create some unique communication difficulties, from the outset the media and other parties were keen to promulgate hypotheses based on information available on the internet about historic water supply incidents and their causes, none of which were relevant to this incident but nonetheless had to be addressed in order to maintain public confidence. The company organised or attended a number of meetings with local politicians, businesses and other affected parties which all proved helpful. I **suggest** the value and timeliness of these outreach incident communication activities be shared as lessons learnt with the rest of the water industry and with the Consumer Council for Water in particular. I **note** that a number of opinion surveys were commissioned by various organisations, including the company, immediately after the water use restrictions had ceased and before my investigation into the cause had been concluded. Whilst I accept that the focus of such surveys is customer service, I question their number and timing, and I have a concern that not all the questions asked were consistent with the facts. I **recommend** that the company jointly evaluates the role of such

opinion surveys in the context of a water supply incident with the Consumer Council for Water.

- 6.3 Whilst the level of cooperation by the Company with the DWI was generally first class, it is necessary for me to point to two lapses which had the effect of impeding my investigation of the incident. At my inspection of the Pitsford Works on 9th July I was not permitted to inspect the underside of the GAC backwash water tank hatches: also my request to view photographic evidence of the rabbit carcass in-situ in the contact tank was initially turned down and only complied with on 31st July. Whilst I acknowledge that the company did not intend to deliberately impede my investigation, I **recommend** that the Company ensures that all its personnel are briefed on the powers granted to Inspectors appointed under the Water Industry Act 1991 and the penalties that exist for impeding an inspector in the course of carrying out investigations.
- 6.4 After information became available to indicate that the oocysts involved in the contamination event and the associated outbreak of cryptosporidiosis belonged to the rabbit genotype, the DWI held discussions with the HPA and the UK Cryptosporidium Reference Unit NPHS to review the science and to identify any gaps in current knowledge. The DWI has since commissioned studies led by the UK Cryptosporidium Reference Unit to establish the taxonomic status of the rabbit genotype of Cryptosporidium, its prevalence in human cryptosporidiosis, occurrence in rabbits, diversity, epidemiology and pathogenicity. This work is funded under contract by the Department of Environment Food and Rural Affairs as part of the Drinking Water Quality and Health Research Programme which is managed by DWI. The aim of the research is to provide information to support water company regulatory risk assessments and decision making in respect of appropriate control measures.
- 6.5 I look forward to receiving a response to each of the recommendations made in this letter by 2nd December 2008. Please don't hesitate to contact me if you have any queries regarding this letter.

6.6 I am copying this letter for information to East Midlands South Health Protection Unit, Northampton Borough Council; South Northamptonshire District Council, Borough Council of Wellingborough, Daventry District Council, Consumer Council for Water , Water UK, Office of Water Services, Health Protection Agency, National Public Health Service and Defra Water Supply and Regulation.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter Halton'.

Peter Halton
Inspector

**Newly installed
covers for the
vents on the GAC
Backwash Tank**



Appendix D

