



Water crises of Flint and Havelock North - Vagrant disregard of public health

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Auckland
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City of Flint (Michigan)



Havelock North (Hawkes Bay region)

Fundamental principles in the provision of safe drinking water...

Principle 1: A high standard of care must be embraced

- No room for complacency
- Competence, vigilance and diligence and are the minimum requirements.

Principle 2: Protection of source water is of paramount importance

- Protection of the source water provides the first line of defence therefore the most significant, barrier

Principle 3: Maintain multiple barriers against contamination

- As any one barrier can fail, robust multi- barriers against contamination must be provided and maintained on a continuous basis.
- Barriers with effective capabilities (ie critical control points)

Fundamental principles in the provision of safe drinking water

Principle 4: Change precedes contamination

- Change of any kind should raise a flag that contamination can occur
- Change must be monitored and responded to with due diligence.

Principle 5: Suppliers must own the safety of drinking water

- Personal sense of responsibility, commitment and dedication

Principle 6: Apply a preventive risk management approach

- Due to delay in detecting contamination - A preventive risk management approach is the best safeguard.

Providers & Regulatory Agencies

Flint (MI) - City of Flint

- Regulatory authorities
 - Michigan Dept of Environmental Quality (MDEQ) ~ Principal enforcement agency enforcing the Safe Drinking Water Act and other legal requirements
 - US EPA ~ Oversees the provision of Safe Drinking Water at Federal level
 - US EPA ~ Provides and mandates a lead and copper rule requiring corrosion control for leaded water mains and service pipes

Havelock North Drinking Water

Supplier - Hastings District Council

- Regulatory authorities
 - Hawkes Bay Regional Council ~ Responsible for extraction and protection of source waters
 - Ministry of Health ~ Prime Regulatory Authority at national level
 - Hawkes Bay District Health Board ~ Carries out regulatory functions of the Health Act for Ministry
 - Medical Officers of Health
 - Drinking Water Assessors

Flint: What went wrong ?

- Switched water supply from Detroit treated water to using the Flint River
- Switch was sudden with minimal preparation
- Staff and plant woefully unprepared
- Almost immediately problems began emerging ~ corrosive brown water
- Flint has a crumbling water distribution network with aged leaded pipes
- Necessary corrosion control not provided after switch due to negligent advice received from Michigan Dept. Environment Quality (MDEQ)
- Flint water “*notoriously difficult to treat*”



Flint: What went wrong ?

- Pathogens, chlorination disinfection by-products, corrosive and dirty smelling water
- Treatment staff besieged with complaints and pressured to *fix the problem*
- Widespread collusion among government agencies of criminal deception
- General motors commercial assembly plant had water corroding metal components - secretly arranged to switch to another supply
- Bottled water filters miraculously appeared in all government offices
- Officials vehemently claiming water supply was safe
- Led to State of Emergency (city and federal level)
- Widespread lead poisoning found in blood of children
- Officials and outside investigators who raised concerns were “handled” to silence to try & discredit



Havelock North : What went wrong ?

- A weekend heavy storm
- Next week people started to become ill
- 40% of the total population effected
- Water unchlorinated as from a supposedly secure bore
- Contaminated storm water leaked into source
- Bores located in sheep grazing paddocks
- Water tightness test could not be performed
- Bore heads were below the ground level
- Inquiry found widespread multi- level failures and a cavalier attitude to compliance.
- Supplier had ignored repeated warnings and numerous transgressions from as far back as 1988 (smaller outbreak occurred).





Havelock North bores and pond
with suspected hydraulic
connection to the aquifer



Government inquiries

- State of Michigan and NZ Government initiated inquiries to find out what happened and who was to blame
 - Flint Water Advisory Task Force formed by Michigan State Governor (Rick Snyder)
 - Congressional Hearing (*House Oversight and Governmental Reform Committee*)
 - Government Commission of Inquiry (NZ Government)
- Crises very different in nature but had strikingly similar parallel failures

Specific Failures

1. Failure to protect the integrity of the sources waters

- Failed to properly designate Flint river as a source of human drinking water
- Failed to evaluate remediate control regulate all discharges to protect the integrity of the Flint River
- Hastings District Council (supplier) was seriously negligent in maintenance / up keep of the extraction bores and chambers allowing surface water to leak into the aquifer
- Hawkes Bay Regional Council negligent in enforcing protection of the source water

Wait and see

- Both failed to take a risk management preventative approach (Principle 6)
- Waited and dealt with problems as and when they occurred

Flint

- Did not implement corrosion control for lead service pipes /mains
- Did not investigate what chemical regime would be needed to successfully treat the river
- Complete change of source water and alert in Principle 4 flagrantly disregarded

Havelock North

- Frequent transgressions (pathogens in supply) and were dealt with if and when they occurred
- Work (advised in 1988) to investigate bore security - remedial work was completely ignored and forgotten

Substandard plant and undertrained staff

Flint

- Plant woefully unprepared ~ only done post treatment of treated water from Detroit since 1967
- Necessary upgrades far from complete. Insufficient stock of necessary treatment reagents
- Staff undertrained and overwhelmed in dealing with the complex chemistry needed

Havelock North

- Plant (bores, pumps, seals, cable glands and chambers) in serious state of disrepair
- Prone to flooding and failure

Failure of consultants and advisors

Both inquiries raised serious question about the competence and work of hired consultants

Flint

- Sole consultant appointed by Emergency Manager - advised that Flint River water was treatable & problems could be managed
- Little regard given to unregulated and uncontrolled discharges to river

Havelock North

- Inspections and evaluations by a junior consultant with little training and supervision.
- Inspections were negligently carried out with a false claim
- Reports at face value were defective and should have been challenged

Failure of regulatory agencies

Particularly serious in both cases

Flint

- MDEQ ~ bore prime responsibility for the crisis. Staff found to be unresponsive obstructive dismissive and belligerent
- MDEQ stalled for months before accepting advice from the USEPA
- Advice given by MDEQ to City of Flint - deeply flawed
- US EPA severely criticised at Congressional hearings for failure to use enforcement action against MDEQ
- Protracted delays with the revision of the EPA's outdated *Lead and Copper Rule*
- Inquiry found MDEQ to be in crisis, under resourced and ill-equipped to carry out its statutory duties.

Failure of regulatory agencies

Havelock North

- Hawkes Bay Regional Council failed to engage with contamination risks of the water source as it issues permits for extraction
- Did not address risk from the many disused uncapped and illegal bores in the vicinity
- Didn't require compliance with a safe and serviceable condition of the water permit issued
- Claims by the Regional Council which down played the seriousness of this failure soundly refuted by the Inquiry

- Drinking water assessors criticised for “not doing enough” in Stage 1 Inquiry to ensure compliance
 - Not acceptable to coerce / cajole the supplier year after year with no progress
- Criticism of Ministry of Health for lack of effective enforcement
- Suppliers with a belligerent / cavalier attitude to compliance had a free run
- Statutory obligations often treated as discretionary activities
- Annual review of Microbiological Quality (2015-6) showed significant numbers of non compliances -
 - Woeful when compared to the UK and other similar countries

Enforcement Policy (Ministry of Health)

- Greatly scrutinised in Stage 2 of the Inquiry
- High level of confusion among officers and assessors
- Testimony given by a Ministry manager found to be unpersuasive and unreliable
- Important written advice by Ministry criticised (6 pages with no clear direction or clarity)

- In conclusion the Inquiry found:
 - The drinking water regime severely under resourced and poorly structured.
 - Current regulatory regime not effectively administered
 - Statutory obligations not properly enforced
 - A complete failure of leadership and stewardship within the Ministry

Conclusion & lessons to learnt

- High standard of care is a must
- Source water protection is paramount
- Under-resourcing and poorly structured regimes lead to the inevitable consequences
- Flint
 - Lack of long term capital planning to upgrade lead reticulation systems- a serious missed opportunity (US)
 - Crumbling /aged reticulation systems frequently failing - long overdue for replacement
 - Fool hardy and short sighted to rely on corrosion control treatment for lead service pipes as any more than an interim measure.

- Havelock North Inquiry made many far reaching recommendations:
 - A new drinking water regulatory authority be established
 - Identified significant problems with the Health Act (2A: Drinking Water)
 - An urgent need for a firm and effective compliance and enforcement policy



Questions and Comments



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