

PREVENTATIVE RISK MANAGEMENT FOR WATER SUPPLIERS:

LESSONS LEARNT FROM HAVELOCK NORTH

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PREVENTIVE RISK MANAGEMENT

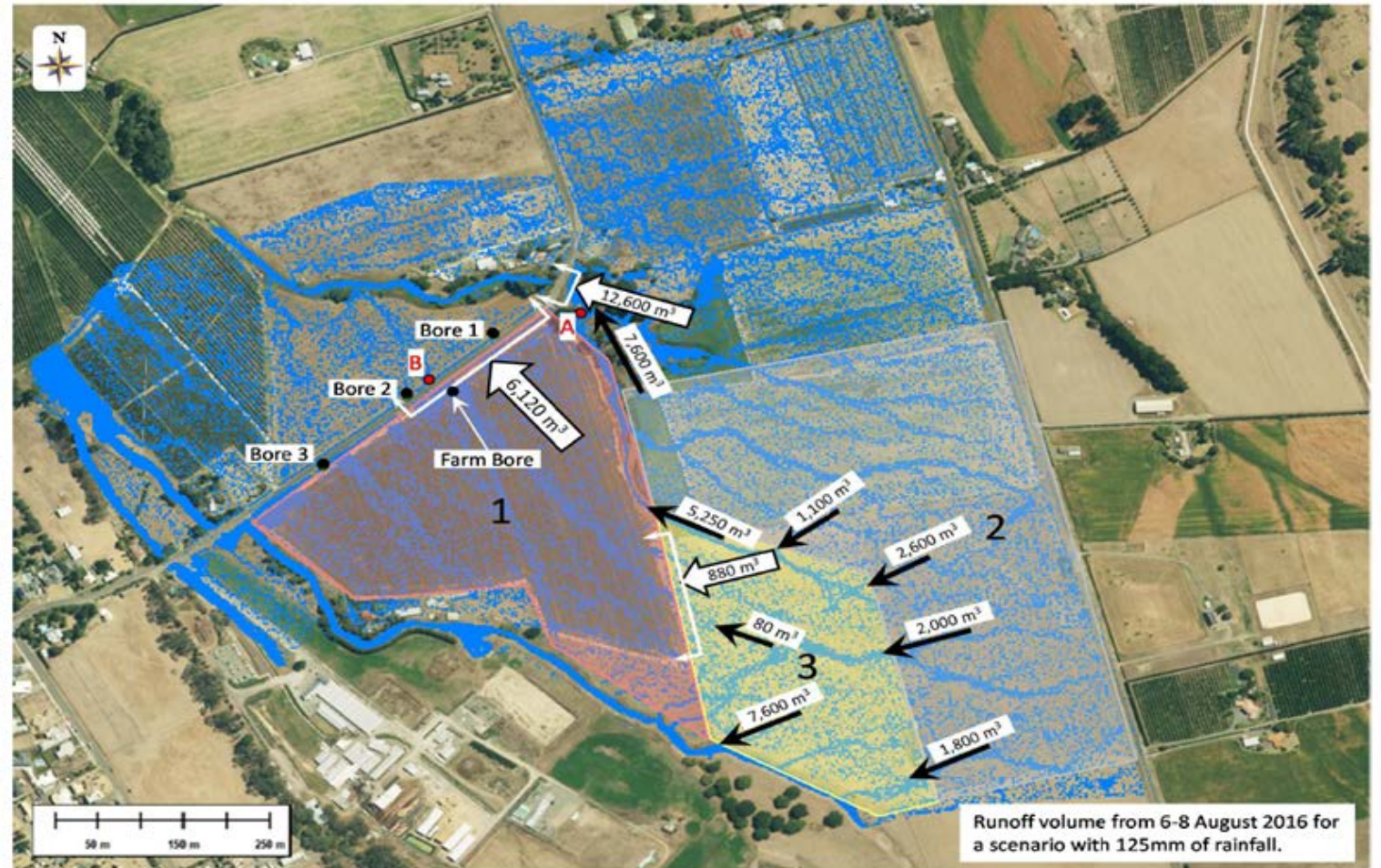
AGENDA

- Havelock North – what happened and why
- International and New Zealand frameworks
- Preventive Risk Management (PRM) – a new way of thinking and doing
- PRM at Hastings District Council – the post Havelock North world
- Conclusions

HAVELOCK NORTH CONTAMINATION EVENT

- 125mm rainfall (peaked over 6 hour period)
- Overland flowpaths transport sheep faeces into Mangateretere Stream
- Overland flow into roadside drains
- 2 theories (bore head overtopping or aquifer)
- ESR analysis links campylobacter strain to paddock 2 (72% of human infection)
- Most likely source determined via Mangateretere Stream

Figure 3 Brookvale Water Supply Bores: Maximum flood extents for flood depths over 10 mm over the simulation period with flood volumes



COMPLIANCE WITH DWSNZ

- Brookvale complied with the **Secure** status in the DWS

Residence time, no e.coli detected over 5 years, borehead security, hydrogeological investigations

- Routine monitoring at source and in the distribution (non-chlorinated supply)

But required monitoring frequency was inadequate to detect problems or to react in time.

- WSP status was “approved”

But ongoing issues were not escalated to management.

- Annual compliance reports showed Hav. Nth as fully compliant (as reported to Council)

Appendix 1. Achievement against the Standards

KEY

Column	Scope	Size	Population	Symbol	Meaning
Bacteria	Zone bacteria achievement with Standards	Small	101 to 500	✓	Achieved Std
Protozoa	For contributing plants	Minor	501 to 5,000	×	Failed Std
Chemical	Zone and plant Priority 2 determinands	Medium	5,001 to 10,000		
		Large	10,001 or more		

Hastings District

Zone Code	Distribution Zone	Population	Size	Type	Bacteria	Protozoa	Chemical
CLI001AL	Allen Lane/Ferry Rd, Clive	198	Small	Local Authority	✓	✓	✓
CLI001VA	Valerie St/Tuckers Lane, Clive	362	Small	Local Authority	✓	✓	✓
HAS001BP	Bridge Pa	300	Small	Local Authority	×	✓	✓
HAS001EA	Hastings East	13,562	Large	Local Authority	✓	✓	✓
HAS001FL	Flaxmere	11,324	Large	Local Authority	✓	✓	✓
HAS001WE	Hastings West & Central	20,829	Large	Local Authority	✓	✓	✓
HAU002HA	Haumoana / Te Awanga	1,900	Minor	Local Authority	✓	✓	✓
HAV001HA	Havelock North	11,623	Large	Local Authority	✓	✓	✓
OMA008OM	Omahu	126	Small	Local Authority	✓	×	✓
PAK008PA	Paki Paki	200	Small	Local Authority	✓	✓	✓
PAR025PA	Parkhill Farm	288	Small	Local Authority	✓	×	✓
WAI007WA	Waimarama	260	Small	Local Authority	✓	×	✓
WHA029WH	Whakatu	337	Small	Local Authority	✓	✓	✓
WHI007WH	Whirinaki, Hawkes Bay	750	Minor	Local Authority	×	×	✓

WHERE WE FAILED

- An over-reliance on the DWS to demonstrate all was well
- Beliefs and assumptions held for 125 years about our groundwater (never had a problem, the water is pure and safe to drink) and chlorine was neither necessary or tolerated
- No oversight of source catchment area and changes over time (heavy reliance on other agencies to maintain protection)
- No event monitoring to detect or understand source water changes
- Not enough “challenge” to our systems to test that all was well (response to transgressions)

We were operating in a purely reactive mode using compliance as our only measure on performance with no ability to intervene before water quality was compromised.

The community was effectively our canary in the mine.

MANAGEMENT FRAMEWORKS

INTERNATIONAL VERSUS NEW ZEALAND

Practices	International	New Zealand
Barriers	Multiple required	One is acceptable
Critical Control Points	Common practice	Early stages of implementation
Risk Assessments	Systemic and infrastructure focused	Infrastructure focused
Monitoring	Operationally focused	Compliance focused



BARRIERS

PASSIVE

- Remove, kill or inactivate
- **Without** operator control or intervention
- Aquifers, infiltration banks, wetlands, backflow prevention

ACTIVE

- Remove, kill or inactivate
- **Because of** operator control or intervention
- Otherwise known as Control Points
- Filtration, disinfection processes

MONITORING?

CRITICAL CONTROL POINTS

CCPs ARE WHERE...

... the barrier (or control point) is essential for preventing hazardous events with high risk ratings.



CCPs MUST HAVE:

- Measurable parameters
- Continuous monitoring
- Critical limits
- Corrective actions
- Shutdown capability

PREVENTIVE RISK MANAGEMENT

RISK MANAGEMENT FOCUSED ON...

...preventive controls not just reactive controls.

...systemic, not just infrastructure controls:

- Example 1: Controls at a borehead
- Example 2: Controls at a network reservoir.
- Quality, preventive maintenance, logging and tracking, resourcing, training, procurement systems.

CHALLENGE ALL YOUR ASSUMPTIONS

MONITORING

IT'S NOT JUST ABOUT COMPLIANCE...

- What does normal look like? (baseline monitoring)
- Is it working? (operational or performance monitoring)
- Will it work? (validation monitoring for new equipment)
- Did it work? (compliance or verification monitoring)

HOW ARE WE IMPLEMENTING AT HDC?

It has been about organisational wide buy-in:

- Setting a new business framework for delivering safe water
 - Independent gap analysis and improvement plan to redefine our needs and priorities (focus on the critical stuff)
 - Capacity and Capability – Matching resources and skills to meet the new Business Plan
 - Restructured 3 Waters (think, plan, do, review)
- Change Management
 - Moving from “crisis mode” to the new norm
 - Creating a future goal and setting a pathway for success
 - Managing the transition to a new way of doing things – technology, systems and processes that manage the churn and create space for our people to excel
- Leadership
 - Acknowledging our faults but not dwelling on the past
 - Commitment at the Governance and Executive level – owning the future of water for our communities
 - Setting the standard and not accepting any compromise

CHANGES AT THE COAL FACE

The changes at the coalface from implementing preventive risk management include:

- Laboratory Services – Strict adherence to ISO.17025 and a total revamp of our sampling practices
- Driving SPZs into the RRMP with objectives, policies and rules to give them the status they deserve
- Development of a comprehensive Water Strategy based on a multi-barrier risk prevention platform
- \$48M package of works (treatment, storage, new water sources)
- Dedicated teams working on strategy, capital delivery and operations
- A Quality Assurance team that maintains our standards and manages our compliance needs
- Document everything of importance (burden of proof/ transparency and accountability)
- Contracts with all suppliers
- O&M Manuals, preventive maintenance schedules, inspection checklists.....

CONCLUSION

HOW CAN NEW ZEALAND AVOID ANOTHER HAELOCK NORTH?

- Compliance doesn't prevent contamination
- Preventive risk management gives the best chance of stopping contamination before the consumer.
- Needs a whole of system approach (more than infrastructure alone)
- You have to be able to demonstrate that the water is safe at any time 24/7, 365 days a year.

CAN YOU PROVE IT?

