FLASHPOINT

NZ INSTITUTE OF HAZARDOUS SUBSTANCES MANAGEMENT

Autumn 2017

History never repeats

- Texas City 1947

USEFUL ORGANISATIONAL CONTACTS

NZ Institute of Hazardous Substances Management
(formerly the Dangerous Goods Inspectors Institute)
www.nzihsm.org.nz
The official home of professionals committed to the safe management of hazardous substances and dangerous goods. The NZIHSM is a 'not for profit' industry association whose goal is to protect people, communities, and the environment against the adverse effect of hazardous substances, while maintaining the benefit of these.

Responsible Care NZ
Box 5557 Wellington 6145
Responsible Care NZ works with industry partners to implement the Hazardous Substances legislation.

Worksafe (MBIE)
www.worksafe.govt.nz
Government agency formed to povide compliance advice and enforcement of hazardous substances. Responsible for hazardous substances certificates.

EPA
www.epa.govt.nz
The EPA administers the HSNO Act and supplies extensive information on working with hazardous substances.

Ministry for the Environment
www.mfe
The Ministry provides policy, publications, technical reports and consultation documents on HSNO legislation.

Department of Building and Housing
www.dbh.govt.nz
The Government agency that maintains the Building Act and the Building Code.

Local Government NZ
www.lgnz.co.nz/lg-sector/maps/
Local Authorities have responsibility for policing building controls. Some local authorities are contracted to Department of Labour to provide enforcement of hazardous substances legislation. Often a first response point with valuable local knowledge.

Government legislation
www.legislation.govt.nz

If you know of other agencies which could be useful to members, please let us know at office@nzihsm.org.nz.

President's column

Another year in paradise!

Hi all:
When I last wrote this column, I thought that it would be my last and I would now be relaxing and reading the musings of another writer by the time this was published. But as often happens, the best plans go awry and at our recent informative and enjoyable NZIHSM seminar, I was sent back in for another innings. C'est la vie!

Fortunately a number of new committee members have stepped up and we welcome Neil, Sigmund, Trevor and Brian to the team, thank Anthony and Rex for their efforts and congratulate Phil, Paul, Peter and David on their re-election!

David Lascelles has stepped up to replace our other retiring Cantabrian, Anthony, to edit our *Flashpoint* for the foreseeable future. These Cantabs are a rugged lot and David has a strong career in the hazardous substance industry, being the former Engineering Manager of Orica and ICI NZ Ltd – amongst the world's largest producers of chemicals – along with his extensive experience in food, oil and finance.

On the haz-sub front, life is progressing in a slow but steady process as outlined by the various articles in this edition of *Flashpoint* including
• the changes expected in cars and automobiles, electric, oil and transport in coming years;
• what a warm rise in sea-level may mean to our 'sea-side' property dreams;
• a memory of one of the deadliest explosions in USA history some 70 years ago, unwittingly caused by simple fertiliser – one for the farmers;
• how to 'get away' from it all and build a 'Drive-on Tramping Hut' or, in other words, 'what to do when public services and power are not available;
• a review of the successful NZIHSM seminar and a BIG Thank You to Infratil, Worksafe and local Bodies in helping us with this success;
• what caused the Havelock North water contamination, now that some verdicts are out;
• review of the EPA and local authority seminars currently going public.

These all equate to a good read and we thank all our contributors and again invite anyone to share their ideas towards the benefit of us all in the future!

John Hickey
Institute president

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Flashpoint

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Editorial material does not necessarily reflect the views and opinions of the Institute.

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Doing petrol smarter

by David Lascelles

Less cars, cars driving themselves (especially around cities), and a proliferation of electric cars as the infrastructure expands to facilitate, is the future seen by motoring ball-gazers.

The amount of car travel responds to affordability. Vehicle usage (expressed in km/capita) grows as fuel prices (c/km) fall. Travel distance varies with driver age, but is closely related to age group's average income. Web and mobile interfaces now offer travel choices in the form of a sharing economy, a socio-economic movement allowing peer-to-peer services (eg Uber, Airbnb), which promotes the efficient commercialisation of under-utilised assets.

Electric vehicles have become technically capable, and global sales penetration is growing from a small base. Recent drivers of mass production include:

- progressively more stringent new vehicle emission standards;
- battery cost declines and performance improvements;
- technology learning from research and development;
- design advancement;
- expectation of continuing cost reduction.

However, we are a long way from replacing petrol. Globally there were about 500,000 electric cars sold in 2016 which is less than 1% of the estimated 1 billion new car sales pa. In New Zealand sales are about 0.3% of all vehicle sales. There will be growth, but off a very low base.

The exception is Norway where electric cars represent about 23% of all new car sales, as the industry is very heavily state-subsidised.

Electric vehicles are not an option for long haul trucks – it can't work – you just don't get there; so diesel will always be the fuel of choice.

Likewise jet fuel will always be with us. They are, however, an option for stop/start applications e.g. rubbish collection trucks are on trial in Auckland and could be trialled in Christchurch).

The on-going improvements in the efficiency of petrol cars year-on-year is a mitigating factor against oil stock depletion. Other countervailing forces at play include the increased demand for improved emission standards (which favours electric vehicles) versus high electricity prices favouring petrol.

Smarter oil extraction

techniques are another factor, e.g. fracking has turned the USA from a fuel importer to a net exporter of fuel.

An OPEC chairman, when asked to comment on whether the fuel age end because we run out of fuel, said: "The stone-age did not end because they ran out of stone; they just found smarter ways of doing things".

The same thing is happening and will continue to happen with liquid fuels.

A wide range of electric vehicles are already available.

This article draws substantially for its content from a presentation given at the last AGM of the NZ Institute for Hazardous Substances Management last October by George Royal, Morrison & Co Ltd, who were involved in the formation of Z Energy NZ Ltd out of the assets of Shell Oil NZ Ltd.

Best endeavours not enough

Our objective as an Institute is to promote the beneficial use of chemicals while mitigating their potential adverse effects. But sometimes with the best of endeavours you just always can't always get it right. The following two recent incidents in Christchurch demonstrate the point.

Head lice huffing:
Two teenage girls at a youth justice facility near Christchurch were rushed to hospital after attempting to huff a head lice product. Staff were treating several young people for head lice when two were seen attempting to inhale the product. The two young people were discharged from hospital shortly after being assessed.

In hindsight, a head lice lotion would have been a safer option.

Chemicals storage cabinet safety:
As HSNO certifiers we take the view that small quantities of hazardous substances (less than 100L or 100kg) can be stored in a suitable cabinet. The following incident serves as a timely reminder of the limitations of this approach.

Part of a local high school had to be evacuated recently after a chemical spill. The advice to the Fire Service was: "We have had some sort of chemical spill in a prep room near one of their science labs . . . . a cabinet has fallen over." With it falling over they [the chemicals] have mixed and we are there because any sort of mix of chemicals is quite often not good."

Part of the school was evacuated as a precaution and the Hazardous Substance Unit was there in case it needed to assist with clean up. A St John spokesman said two people were assessed by paramedics at the scene, but were unlikely to need further treatment.

Three observations are pertinent:
(a) that the cabinet fell over indicates it was not secured to floor or walls;

(b) there appears to have been no immediate understanding as to what chemicals were involved in the incident; and

(c) The mix of chemicals appears to have been incompatible as the incident was sufficiently serious to precipitate the need to evacuate part of the school.

Clearly these are all issues we need to be cognisant of when certifying such facilities.

Auckland: sub-marine property paradise

As far back as 2009 we commented on a United Nations President's report that stated:
Climate Change heats up – the time for hesitation is over.
• The rate of melting glaciers has doubled over the worst predictions.
• Sea levels may rise by 2 to 10m by 2100 instead of the initial 0.5m predicted.
• The Arctic may experience summers free of ice by 2030.

Was this all nonsense and just an effort to 'spoil our party'???

In a 2009 Flashpoint article we considered the phenomenon of global warming and asked what was this all about? Unfortunately the science has not changed in spite of the 'Ostrich effect' sometimes entering the offshore political process.

Some of us also have a high level of interest in the property market, and like most humans it is often nice to have a lovely sea view! So why not help out our real estate market and see what effect a 1.8m high sea level rise will have on our biggest property market Auckland and where a boat-shed may be more appropriate than a garage with a sea level rise of 2-10m over the next 83 years (see attached diagram page 6 page on effects on Auckland).

But in order to see why the sea may further encroach on our landmass it is useful to recap on what this global warming is all about?

Several hundred years ago a French scientist Jean Baptiste Fourier was struggling to establish what determines the temperature of the Earth's surface. Fourier's calculations suggested that the Earth's temperature should be -15°C, that is, we should be frozen like an ice block. He concluded that something in the atmosphere must have been trapping the heat in.

Many years later with our increased knowledge we now call these things greenhouse gases. Short wave (ultra-violet) light rays pass through an atmosphere charged with greenhouse gases and most reflect off white surfaces. However, dark surfaces absorb shorter light waves and create longer wave heat rays in a process called 'black body radiation' and these longer (Infra-red) waves have trouble getting out past the greenhouse gases, which can trap them in, just like the glass roof on a greenhouse.

Examples of greenhouse gases include water vapour, carbon dioxide and methane.

As most of us do not all want to live in the perpetual ice at -15°C, we can see that for us, in general, some greenhouse gases are actually a good thing. But to have control in any sustainable process we need to be able to balance what goes in with what goes out.

Many scientists are now saying that in the past 100 years the percentage of CO2 in the atmosphere has increased artificially as humans burn organic fuel, while at the same time the trees that absorb CO2 are also being reduced, potentially creating an unbalanced system with a variety of consequences and issues.

Nine hot years

Nine of the 10 hottest years recorded have been since 1990 and the rate of carbon fuel burning has increased in line with a doubling of the Earth's population since 1961 and has ramped up in the past 15 years. And yes, you guessed it, each of the last few years has again been hotter with 2016 again being the 'hottest on record'.

This may not be too bad with a gentle realignment of the process over time which can be self-correcting in a changing weather process. However, if we get a cataclysmic event or step function the process can run out of control and never get back to where we were.

One possible result of this is 'wacky weather' where the nice long fine periods are interspersed with high energy, big rain events such as the January 2017 "NZ weather bomb" event including 162kph

Time warp: Ngati Whatua warriors in their waka would have been astounded to see what their foreshore had become.

Photo: *Auckland Council.*

winds near Wellington, the 2016 storms in the Phillipines where 320kph winds were seen, fires across dry areas or the annual increase in tornados across the American continent.

However, there may be benefits as the Arctic ice melts and full year sea-travel across the North sea polar shelf becomes possible as has been recently witnessed, but if our Antarctic land ice melts, then sea levels could potentially rise by up to 30 metres!!

This is the major risk with global warming; while many of us may like the idea of a warmer New Zealand, it is these potential cataclysmic events that represent the major downside risk for humanity with potential consequences too great to ignore.

While there is not room to discuss all of the possibilities here, what would it mean to the Auckland property market if we had a loss of waterfront land as sea levels rise by the 2 to 10m predicted?

Beachside Dream

To help see this we have superimposed a 2 and a 10m sea level rise on the current Auckland contour map in order to see what changes may be necessary? (see attached).

As we can see, even with a 2m sea level rise gondalas may be necessary in the lower ends of Queen Street and the higher levels of K-Road will now become a most desirable spot with sea views.

Unfortunately Mission Bay will now be no more and the aptly named Mission Cliffs will need to have additional sea-wall protection to avoid luxury homes falling into the ponds below in a similar manner to some cliff-top homes after the Christchurch earthquakes.

While the actual sea level rise is important, what must not be forgotten is the difference it makes to tidal or storm surges – a rise of 1.8 metres in sea level may lift storm surges 3m or more over the former high tide – lifting them over former natural barriers and flood previously dry areas.

But while we do urge caution at accepting such predictions as a fool-proof investment strategy, we can note that some homes on Manukau Island may become most sort after for the modern day boat commuter interested in 'getting away from it all'!

Above: a projection of the likely effect of a two metre sea level rise on downtown Auckland. (Auckland Council)
Below: the effects of a 10m sea level rise. (Jonathan Musther)

70 years ago:

Texas port obliterated

Searchers looking for survivors at the Monsanto terminal.

The freighter *SS Grandcamp* disintegrated in an explosion at a pier in Texas City, Texas nearly 70 years ago while loading ammonium nitrate fertiliser. A fire aboard the ship caused the cargo to explode, demolishing the ship and the immediate area and raining death and destruction down on the Texan landscape for many kilometres around.

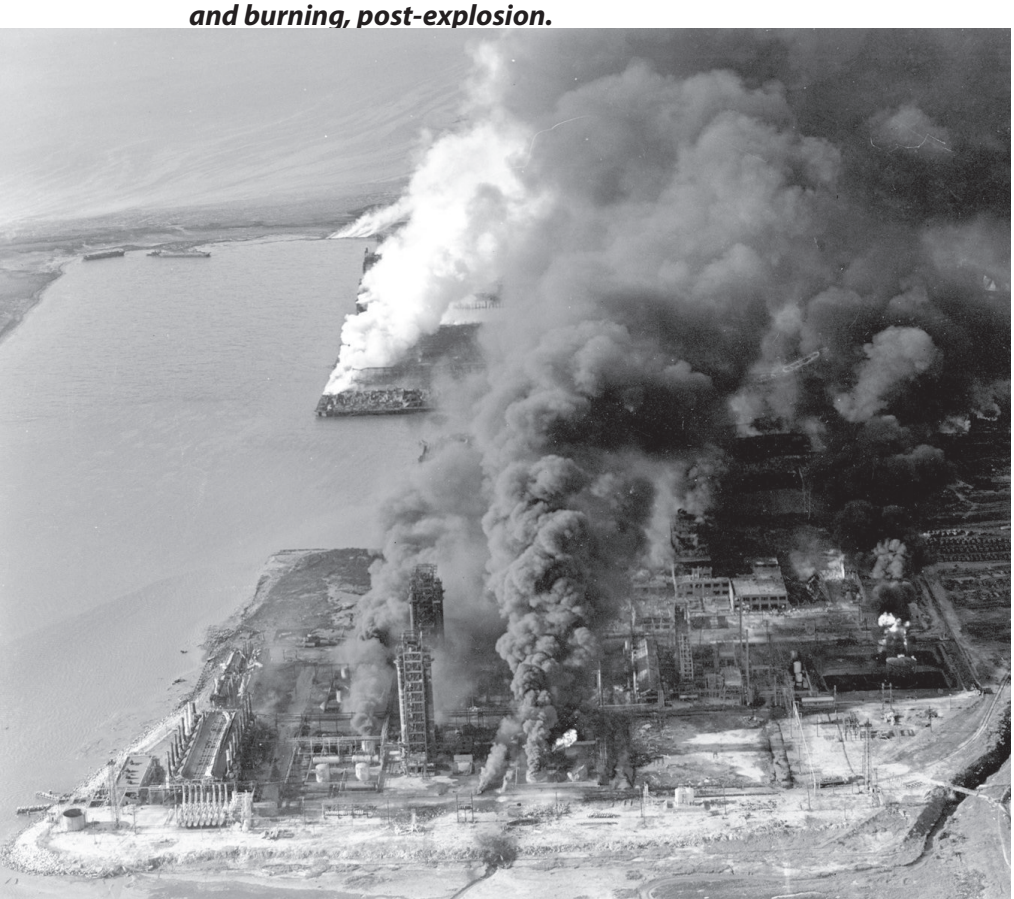
It remains the deadliest industrial explosion in US history, killing 581 people, injuring about 3500 more and causing about $6 billion of damage in today's money.

The *Grandcamp*, a World War II Liberty ship that had been converted to a French merchant vessel, was taking on a load of ammonium nitrate fertiliser at a quay next to a complex of Monsanto chemical factories, offices and labs.

The ship's carpenter smelled smoke in the No. 4 hold around 8 a.m. and found that a few bags of fertiliser were on fire. He tried dousing it with a few buckets of water, then a fire extinguisher.

When he called for a hose, the ship's captain forbade it, fearful that water would destroy the $500 worth of cargo that was on fire. The skipper ordered the hold closed and its fire-suppression valves opened to release steam. Ordinarily a good idea, but not in this case.

The Monsanto refinery and other facilities were destroyed and burning, post-explosion.



Ammonium nitrate decomposes at around 350º. The fire grew. The captain ordered his crew to abandon ship. Firefighters tried spraying the burning ship from the dock. Spectators, including schoolchildren crowded the quayside to watch the action.

The blast was heard 250km away. It shattered all the windows in Texas City and half of those in Galveston, 16km away. Some debris reached an altitude of nearly 4.5km before falling back to earth – two airplanes circling overhead were blown apart by the heavy shrapnel. A one-tonne piece of the ship's propeller shaft landed 8km away. Other pieces sailed 8km.

The blast flattened 20 waterfront blocks and 12 blocks inland. Flaming debris ignited oil, gas and chemical tanks at the sprawling Monsanto complex (killing 234 of the 574 workers there, while nearly all of the survivors were seriously injured) and three nearby oil companies.

People died everywhere, blown up by the blast, decapitated by flying metal, sliced by falling glass, burned by flaming metal

The destruction was startlingly similar to that of Taijin in China lin 2015 with rows and rows of new cars on the wharf reduced to shells and port buildings looking like they suffered WWII carpet bombing.

and chemicals, crushed by falling buildings. The litany of death was long and varied. Thousands more suffered injuries.

Fire and rescue workers rushed in from nearby cities, and the Red Cross mobilised a massive national response. The fires kept burning, at the docks, the tanks and all over town.

But the horror had not yet ended – the cargo ship *Highflyer*, which had been moored near the *Grandcamp,* caught fire the morning after the explosion. When the fire seemed to be getting out of control, tugs were called to tow the ship out of the port, lest its own cargo of fertiliser explode.

Unfortunately, the force of the *Grandcamp* explosion had locked the *Highflyer* into a deadly embrace with the *Wilson B. Keene*, and wouldn't budge.

The tugs gave up. The *Highflyer* blew up, demolishing the *Keene*, and raining death and fire anew on Texas City. The shockwave and new fires killed hundreds more.

The fires burned for two weeks. Bodies and parts of bodies were strewn all over town. More than 1500 houses – a third of the town's housing – were destroyed. Two thousand of the survivors were rendered homeless.

The *Grandcamp* had been carrying ammuntion but the crew managed to unload this before the fire got out of control. It may still have contributed to the general chaos.

Many ships in the harbour were sunk or badly damaged, or swept ashore by the resulting tidal wave.

Diary of an off-grid eco-hut

It was somewhere on the West Coast of the South Island that a strange idea formed. We had been in the bush, up and down the West coast rivers for a few days, emerging around Cass on rhe Canterbury side of the Alps ready to head back to our respective big smokes.

Shortly after, we were sitting around enjoying a well-earned drink and cards when one of our party took his boots off after almost three days of river travel. You can imagine his horror to find that he could hardly stand up as his Archilles had swollen and after three days river bashing, his ankles were not moving as they should.

What a worry! Crippled in the name of fitness and still a way to go!

What you need is "a Drive-on Tramping hut!", said one of the team, much to the amusement of all. But hey, why not, it certainly would be fun trying to develop it!!

And so the idea was born and we set about trying to germinate a simple thought into a reality! Whose bright idea was this?

How do you do it?

1. Site: Yes, to do this you need a site: not any old city site but somewhere 'out there', away from it all where humans aren't seen much and life is all about trees and birds.

2. House: You will need a dwelling, preferably wood here as this fits into a tree-lined environment

3. Water: All life requires water, most humans need about two litres per day, but when you are far away from a 'town supply', how do you find your own?

4. Waste: How do handle your waste, sewerage and outputs? Can we recycle and reuse our own waste streams?

5. Heat: Typically we need to maintain our body heat around 37°C even when our surroundings may be down to zero. But how can we do this when the world is cold around?

6. Power: We are an electric lot – we use this for light, heat, hot water, refrigeration to mention a few. But what if we are miles off grid, how do we cope?

In a series of short pieces, we will try and cover all of these from the selection of a suitable site to the creation of a fully functioning 'off-grid' house.

The site

It is actually quite fun trying to find a site that is away from it all, but close enough to a roadway to allow a drive-on access.

There are sites in the city, but too crowded and pricey, country sites filled with grass but often too flat with sheep and cows as companions; there are beautiful rugged areas in our national parks, but who is allowed to build in a national park, let alone drive there!

But then after much searching, up jumped a rugged cliff type area filled with views, trees, birds and goats. OK, it was steep and no-one had been willing to try and put a dwelling on it. But we are tenacious trampers and no cliff is going to daunt us against our

Carefully on the way up.

goal of 'Drive on Tramping'. So we purchased the cliffs.

But how can you put a hut on a cliff, surely we need a nice flat section?

Well, we can do this although we were having issues convincing the council that it was a good idea, let alone some local builders. But after some six months the council was satisfied that it was possible and granted a consent.

We found an aged and experienced digger driver who could spin a 3-tonne digger on its nose. Just our man, and following three months in the design process and six months though the consent process, the site clearance could finally start.

Digger was remarkable and could flip a 3-tonner like a pancake clearly all around him. In just three days the site was clear – a 15m by 5m platform was leveled and ready for a hut. Not only that but a two lane access track lead up to the road above.

What a transformation, the shrub-hugged cliff had been transformed into an access road with a flat ledge beyond.

The 2016/2017 NZIHSM Committee:
Sigmund Batucan, Paul Banks, John Hickey, Phil Tse, Brian Williamson, Trevor Walker, Peter Keller, Linda Amitrano, Neil Debenham, Dave Lascelles.

N***estled into its new space, the eco-hut begins its new career.***

Bleached chicken, anyone?

Some people were taken to hospital and others treated by paramedics after a recent chlorine leak at a chicken plant in Newcastle. All were reportedly in a stable condition after suffering symptoms from breathing difficulties to nausea.

The leak reportedly happened on a production line, where staff had been overcome by chlorine off a chlorine solution used for cleaning equipment. The company here isolated the leak once they realised the chlorine was leaking. Remediation consisted of putting fresh water through the pipe work to clear the system out; followed up with monitoring equipment to check that the facility was now safe." Contaminated water from the incident went into treatment tanks for treatment on site.

This incident demonstrates the need for both good emergency preparedness, and anticipation of what may be required to deal with the by-products of dealing with a leak or spill.

NZIHSM seminar

It was a 'warm' day for Wellington and a large group of Hazardous substance professionals had gathered for the annual NZIHSM hazardous substance seminar at the Mecure hotel.

The day started with an introduction from Linda (the NZIHSM Administrator) with a short update on the achievements and successes from the previous year linking into the first seminar of the day.

To start the day off we heard from John Hickey who is a chemical engineer and a certifier discussing "What use are hazardous substances anyway?"

This was rather an interesting take on uses for what are normally considered hazards, however John put forward the proposition that nearly all hazardous substances actually have matching benefits if used correctly. At the end of this he had three main points for HS controls:
1. Protect and Understand the Process
2. Don't forget the Science and
3. Keep checking (the Compliance feedback loop)

Not too bad a start!

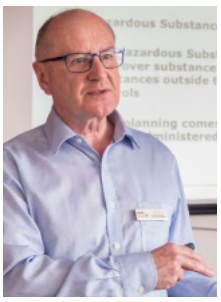
Next up was a key speech for the day from George Royal of Morrison & Co and Infratil, the founders of Z – one of the largest organisers of airports, buses and New Zealand Utilities).

George lived up to expectations and delivered a fine presentation looking at trends

in the use of cars and what this means for the future of liquid fuels and how the use of vehicles is growing again after a slowdown following the Global financial crisis the use of the web and internet in automobile transport and the future of automobile transport including electric vehicles.

This was a valuable presentation and George showed how the use of the car and its use of fuels may change over time.

Our next presentation was from Worksafe and in particular the progress of the Major Hazards Facilities Regulations and from this the development and formation of the WorkSafe High Hazards Unit. In his usual style, Geoff symplified the process into easy steps, discussed the 70 upper tier and 80 lower tier sites



as at late last year and their spread across the industry and country.

Geoff further developed how the High Hazards Unit would work alongside other legislation and test certifiers in order to ensure that 'everyone who goes to work comes home healthy and safe' – overall an enjoyable insight.

After lunch Peter Keller, an expert from a local authority, lead us on a presentation of that often forgotten cousin of the HS industry – waste systems. Possibly biowaste and recycling is one of the growth areas of modern industry and Peter led us through a fascinating insight into his vast experience in the conversion of biowaste to energy technologies.

This was very informative and detailed the often murky world of anaerobic and aerobic technologies and how, through the use of these, not only can we recycle our waste streams, but clean the environment and make money while we do it!

Little bug causes much damage

Civilisation has been built on clean water, but as we now all know, late last year over 5000 people, over half the adult population of Havelock North, suffered food poisoning and some to a chronic extent. In some cases this has lead to prolonged sickness and is possibly blamed for some deaths at that time.

What is possibly worse is that the 'clean water' often used to 'cure' food poisoning turned out in this case to be the cause!

So what happened?

Following *Flashpoint's* previous issue article shortly after the event, where we indicated that a little bug called campylobacter as a likely cause, it now appears from subsequent studies that we were correct.

But how could this happen and surely this would be sorted by water treatment, would it not? Well, contrary to major belief, not all drinking water is treated in New Zealand. In fact, many of the sources of bore water from ground aquifers in New Zealand rely solely on porous rock bases for sterilisation?

Because an aquifer water feed is usually well below the ground, from a dark and air free space, if the water is 'old enough' then any bugs will have died and the water will be sterilised and should be clean.

As the 'old' water is extracted through a sealed hole, called a bore, the water should be clean and in many cases it is believed that it does not need to be treated.

Unfortunately in this case the water was not clean and in a sad event for first world countries almost a whole township was poisoned by 'something in the water'!

So where did this happen? Scientific tests carried out as part of the investigation, show that the Havelock North drinking water supply was contaminated last year by a surface pond (the Mangateretere pond) less than 100 metres from the Brookvale Rd Bore No 1.

To determine this, scientist's conducted a dye tracer test, in which they raised the pond level to where it was after heavy rain last year, and added a green fluorescent dye.

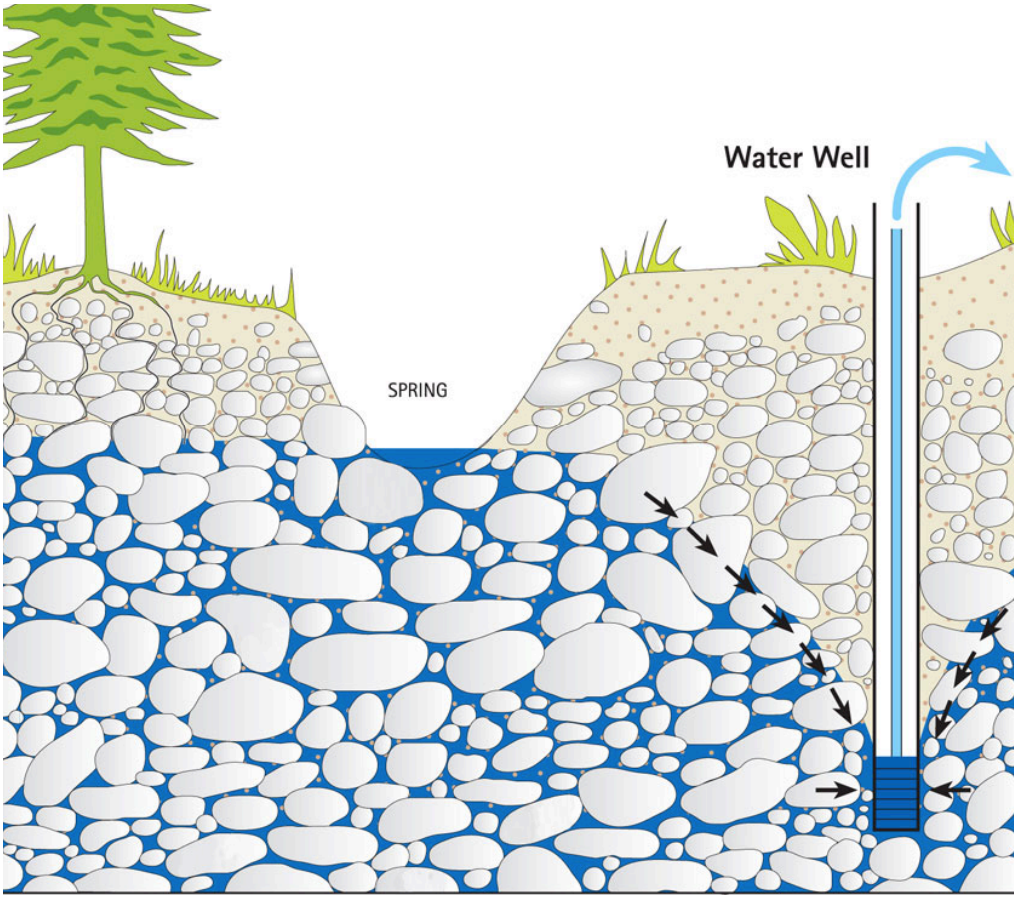
The bore pumps were turned on a few days earlier to replicate start of pumping on during the poisoning period.

The summary of the report stated that "The fluorescein appeared in Bore 1 29 hours after its introduction into the pond. This continued for the next seven days until the test was concluded.

Campylobacter was also detected in Bore 1, two days after the dye was introduced. Campylobacter was also detected in the pond."

The report said the timing of events in the tracer testing exercise matched the time scale of the outbreak in August 2016. The inquiry heard E coli in the pond probably came from sheep faeces washed in by heavy rain from three nearby paddocks.

While the inquiry has not yet released the report after the



above tests, the Mangateretere Pond was identified as being a likely contamination source.

The local mayor indicated that before last year's contamination the bore had only had one other E coli reading in its 35-year lifetime. However, he expected more rigid controls to prevent such contamination happening again and indicated that the bore would be decommissioned.

So how can we prevent this? Even 35-year-old 'safe systems' can fail at an unexpected moment with serious consequences for the community. This would indicate that we still do need to continuously inspect our water systems, test our water systems and use chemicals to treat our water systems against the microscopic invaders who can cause us most sickness.

Dodgy job

This year in Australia there was a very sad case where the wrong gas was administered in hospital and the patient died. A preliminary inquiry revealed that the plumbing was a dodgy job and had never been subjected to the procedures we follow as 'must do's ' in the chemical industry.

EPA goes public

Hazardous substances abound in everyday life, and often people do not realise the influence these toxic products have on the environment around them.

To get a better handle on the issues and ensure public safety, the EPA is holding a number of workshops around the country with representatives from territorial authorities providing feedback from their experiences on the ground.

Hazardous substances range from commercial waste, to agricultural products both on private property and public spaces, weed killers and face paints.

EPA hazardous substances compliance manager Ray McMillan said a workshop held in Napier was attended by staff from Gisborne, Hastings, Wairoa and Napier councils ranging from rural firefighters to town planners. It was a successful meeting that identified areas where the local enforcement personnel had issues or difficulties.

As enforcers these are the people charged with dealing with events ranging from chemical spills (in which case they would need to know what other agencies to contact) to ensuring compliance with rules such as not flushing certain substances into stormwater systems.

Issues that they identified were the need for more co-ordination, sharing information, maintaining skills, training and funding expertise within staff.

"Environmental issues are quite complicated and require a multi-agency approach," he said.

"That's what's driving us to engage with those responsible and see where we can improve the system, whether that's practically or a long-term strategy we need to start working on now."

The workshops will be held with all 66 territorial authorities by June this year.

Ray McMillan sorts through material from the Napier seminar. Photo: *Paul Taylor*

NZ Institute of Hazardous Substances Management (Inc)

MEMBERSHIP APPLICATION FORM

1. Name: .....

   First Name *Surname*

2. Employment

   Business/Employer's Name: .....

   Position and Contact Details:

   Position Held: .....

   Qualifications: .....

   Experience in HS:

   .....

   .....

   .....

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3. Preferred mailing address:

   .....

   .....

   .....

   Telephone Contacts (Bus.) (0) .....

   (Res.) (0) .....

   (Mob.) (02) .....

   (Facsimile) (0) .....

   E-Mail: .....

   Website: .....

4. I have previously been a member of the Institute ☐Yes ☐No

   If NO: I am applying to be a ☐Member ☐Associate member

5. Return to: P O Box 10-385, The Terrace, Wellington
   Email: office@nzihsm.org.nz

How did you find out about us?

.....