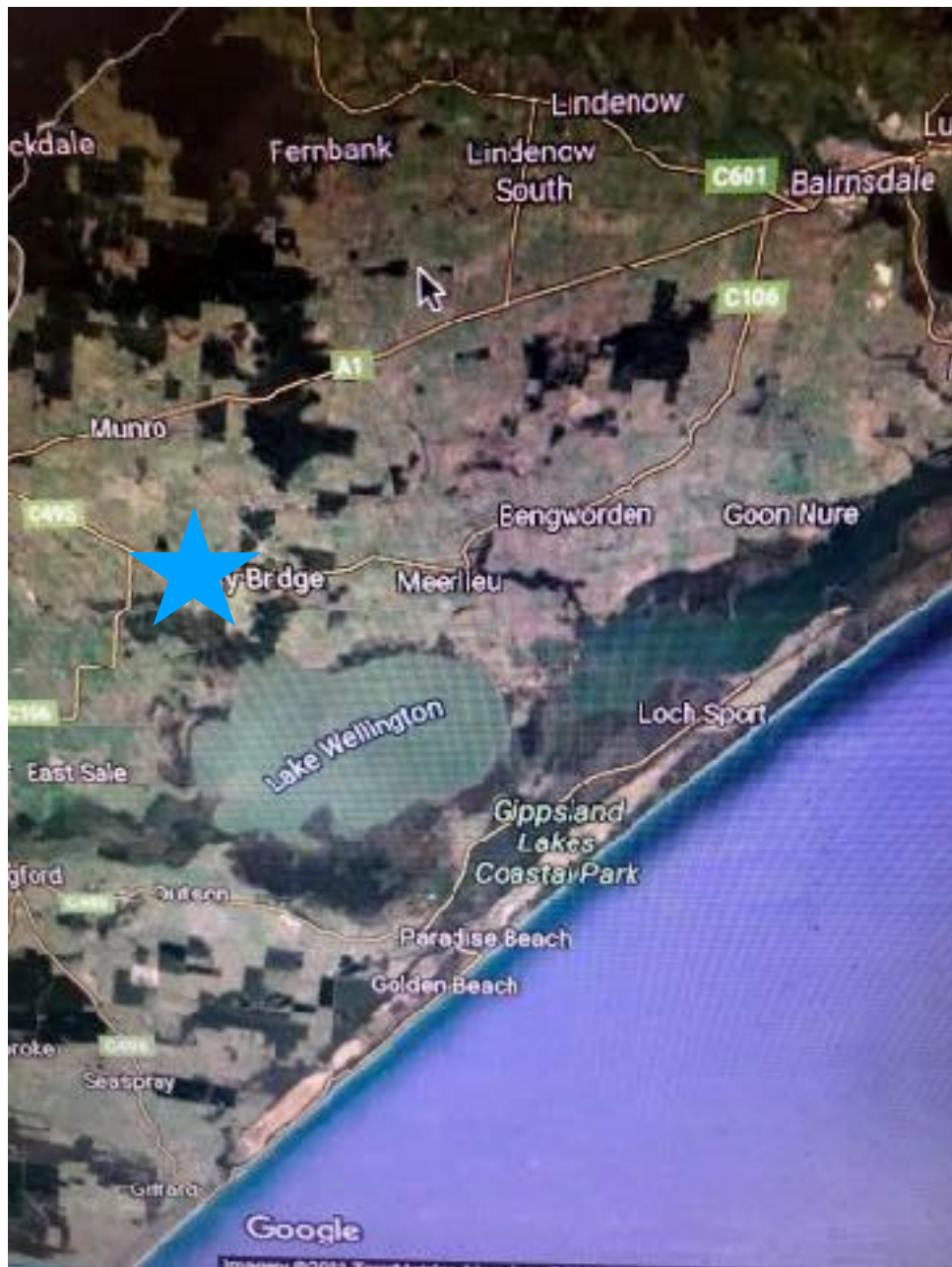


I am a paediatrician and have worked in Sale and East Gippsland since 1992.



I spent several years in the early noughties as the president of WRATH (Wellington Residents Against Toxic Hazards). We were a community group fighting plans to turn Dutson Downs into a toxic and radioactive waste dump. Initially the politicians and industry representatives, scoffed at community concerns and suggested that the waste was no more radioactive than a bucket of road gravel! I worked closely with a physicist and engineer living in the local community. We engaged with The Hazardous Waste Siting Committee and ARPANSA at that time. One of the key outcomes of this process was improved management of NORM waste from Esso - BHP's off shore operations. This was no longer a quiet burial of nuisance oily waste, after it was revealed that it was radioactive in the aftermath of the Longford Gas Plant fire.

ARPANSA and The Victorian Health Dept oversaw the development of specially designed burial pits. From memory it was stipulated that these were lined with geotechnical fabrics and underlain with sampling pipes to collect any leachate. Furthermore, there had to be at least one metre of impermeable clay above and below the NORM waste. (This was in old sand dune country between The Gippsland Lakes and Ninety Mile Beach).

Given what we have heard about rehabilitation plans simply mixing mineral sands mining waste in with soils, one has to consider whether it is really as simple as indicated to date.

The reason that I came to work in Gippsland is that my parents bought a property in Longford in the mid-seventies. This would have been about ten years after the offshore oil industry started up. Dad always wanted to build an artist's studio overlooking water, and where he would not be interrupted by phone calls. They bought the land because it had a shallow lake the size of a cricket ground which often had swans and always tortoises, and family and friends swam in it in warm weather, or mucked around in little boats.

The lake was spring fed, and local folk lore claimed that the first owner had ploughed through a hollow, there was an explosion, the horses bolted and water began welling up out of the ground. There was also a spring by the roadside that fed a creek running away into the wetlands along the Latrobe River.

Over a few years the lake became drier and only contained water in wet years. Then it dried up completely and hasn't held water for the last two decades.

The spring and its creek also dried up.

This is recognised as being due to Esso pumping produced water over the side of its offshore rigs, and the coal mines in the Latrobe Valley pumping out water. The result is that the water table in Longford and Yarram areas has continued to drop approximately a metre per year.

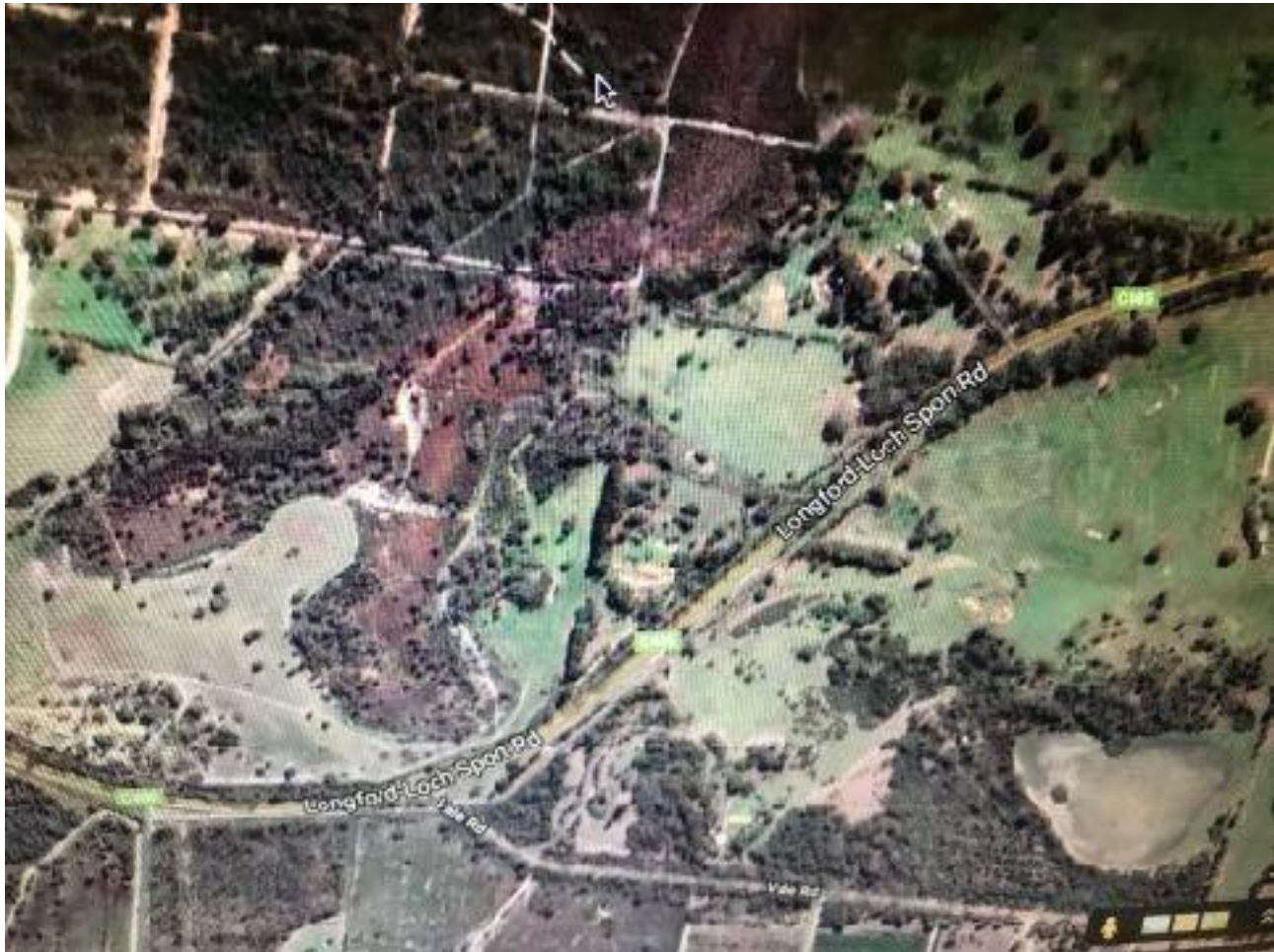
I believe this is the same Latrobe aquifer that Kalbar hope to source water from.

In late 2010, new neighbours across the road cleared and burnt off a bush area where the spring-fed creek used to flow. They set alight peat beds where the old creek bed had been. This ended up burning for 2 years.

My mother had bad lungs already and lived across the road. We were living with her during renovations, at the time. I do believe this event contributed in part to her eventual demise. I was extremely concerned about our AQ and became very active in finding out more about the subject, with help from Doctors for the Environment (DEA). I was unable to get the EPA to monitor the air quality being breathed by Longford residents.

In 2011 the east coast experienced heavy rain, with devastating floods in the Brisbane area and also heavy rains locally, with the South Gippsland Highway between Longford and Sale cut by flood waters for approximately 2 weeks. Despite this, the peat fire was not put out, and the state ended up spending millions clearing the roadsides in the area to provide firefighting space in the event that a north wind day in summer, should fan the peat fire and start a run that might burn through to Esso.

Ironic indeed that the state was paying to protect the assets of the company they were a major contributor to the problem in the first place!!!



Longford: Dry lake = bottom R . Dried creek = central brown area

I was subsequently involved in the EPA conference regarding the Dual Gas Project in the Latrobe Valley, with DEA.

I subsequently endured the Hazelwood mine fire and was actively communicating with the EPA and the Chief Medical Officer throughout, about air quality in east Gippsland. I note also that during that time, I did a clinic in Bairnsdale and when I got out of my car, was surprised to smell the peaty/ lignite burning smell. Clearly on the wrong wind, emissions from the Morwell area were reaching 100 to 150 km away, or the volatiles, at least, were airborne that long. I subsequently participated in the Hazelwood Health Study Clinical Advisory Committee. I have also been The Australian Paediatric Society's delegate to the National Rural Health Alliance since 2006.

So, in short I have no formal qualifications beyond MB BS and FRACP, but I used to teach environmental medicine to Monash Medical Students in Sale. I have also had something of a passion for air quality issues and participated in the Latrobe Valley AQ monitoring Co-Design process, and citizen science trainings.

Issues of concern from a health perspective:

- Air Quality
- Radiation
- Water quality
- Noise
- Mental health
- COVID
- Transport

Potentially affected:

1. Workers
2. Locals
3. broader community
4. Stock and ecosystems

Air quality:

Air quality matters because poor air quality affects the health of affected people and animals.

A particular problem in this area is that there is no EPA monitoring of our air quality which can be pretty ordinary specially in relation to smoke.

Whilst EPA permanent monitoring stations do go offline from time to time it is not usually for more than a few days at a time unlike the monitoring provided by KALBAR during the pre-EES data collection.

This community needs AQ monitoring whether or not this project goes ahead. The public needs to be able to look up the current AQ whether that be linked to the other EPA sites through the EPA website or funded by KALBAR and available to us all. Hypothetically if Kalbar or the EPA did us the community service of providing us with AQ monitoring, it might throw up some interesting dilemmas.

If high particulate readings popped up, especially in summer or the burning seasons in spring and autumn when it might be smoky, what is the response? Is it assumed to be smoke from other sources and just ignored? If additive effects from the Kalbar operation can be shut down to lower the cumulative effects is that an appropriate action? Who makes the call? If it does not seem to be smoky, what then?

There clearly needs to be monitoring, and who does it is not that important, so long as it is done well and there is a clear plan of action to respond to different scenarios.

If this project goes ahead the modelling does need to be tested in real time, not least to find out the real weather conditions for the 22 % of year they failed to collect, but also to monitor the actual dust measurements.

The size of the particles determines the effects. The eyes and nose are immediately and obviously affected by dust of all sizes.

The smaller the particle the further down into the lungs it will travel.

Smaller than 7 micron reaches into the alveoli where gas exchange takes place between the air sacs and the blood vessels. It is well known by doctors, but not so much by the general public, that the lungs are a fast and efficient way to get drugs into the bloodstream within seconds. This pathway avoids filtering out by the liver, which occurs when drugs are swallowed. Hence inhaled particulates go straight to the heart...and then are pumped to the rest of the body.

The terminal bronchioles are 7 micron so they exclude particles larger than this, which are removed by the cilia sweeping a mucus layer towards the mouth where they are coughed or swallowed.

Smaller particles still, can get into the blood stream and circulate via the heart to liver, kidneys, brain etc. So, for both radioactive and non-radioactive pa or other health effects. Some like Silica can cause chronic lung disease turning relatively young people into respiratory cripples and can also cause lung cancer.

The World Health Organization concluded that particle pollution causes lung cancer. The IARC based its decision on the review of multiple studies from the U.S., Europe, and Asia and the presence of carcinogens on the particles.

Research has also linked year-round exposure to particle pollution to:

- development of asthma in children;
- worsening of COPD in adults;
- slowed lung function growth in children and teenagers;
- increased risk of death from cardiovascular disease; and
- increased risk of heart attacks and strokes.

Scientists have also found evidence that particle pollution may impact pregnancy and birth outcomes, such as preterm birth, low birth weight and foetal and infant mortality.

From USEPA

EPA Concludes Fine Particle Pollution Poses Serious Health Threats (2019)

- Causes early death (both short-term and long-term exposure)
- Causes cardiovascular harm (e.g., heart attacks, strokes, heart disease, congestive heart failure)
- Likely to cause respiratory harm (e.g., worsened asthma, worsened COPD, inflammation)
- Likely to cause cancer
- Likely to cause harm to the nervous system (e.g., reduced brain volume, cognitive effects)
- May cause reproductive and developmental harm.

—U.S. Environmental Protection Agency, *Integrated Science Assessment for Particulate Matter*, December 2019. EPA 600/R-19/188

Different constituents have different effects on different organs.

The data provided in the EES unfortunately focuses on larger particles which are of more nuisance value.

The AQ report notes that Kalbar said there was no hexavalent Cr! "because Kalbar said so" seems a little casual.

I am most concerned that the assessments missed 22% of the weather data. Of particular importance is the fact that most of the hottest, driest time of the year was lost, which is when strong winds would be expected to create unsafe conditions for workers and nearby residents.

In hot weather, we all open up our houses at night to allow cooler night air to enter. If it is too dusty to do so, vulnerable people will be put at risk. In the heat wave preceding the black Saturday fires, there were over 300 excess deaths and mapping showed a high preponderance of elderly ground floor dwellers, too security conscious to open windows up. It is well recognised that the stress of more than 3 days extreme heat is deadly.

I would recommend that all operations cease on high fire danger days, which are by definition hot, dry and windy. Consideration also needs to be given to limiting nighttime activities over the summer months in general. If windows are open it will also be noisier.

I note also, that predicted data is presented for years 5, 8 and 12 of the project, but not for the construction phase which may be far worse. I agree with Mr. Simon Welshman that monitoring needs to occur throughout the construction and beyond, with clear cut offs, and chain of command as to how and who by, a response should follow.

RADIATION

In Attachment 2 of advice to the IAC from DHHS they recommend That ARPANSA advice be followed and that periodic reviews be undertaken by the Department

ARPANSA (August 2020) has recommended that all states provide dose records for Individual workers, to a National Dose Register which would maintain the record for at least 30 years or until the exposed worker turns 75.

This is important, particularly as this mine is only expected to produce for 15 years, but the health effects for workers are not over when the mine closes.

Currently the limit is *not more than 1 mSievert annually averaged over 5 years*, for the general population. For occupationally exposed workers this is 20 mSievert (but no more than 6 mSievert for 16-18 yo workers)

For pregnant women the upper limit is recommended to be 0.5 mSievert

It should be noted here that children are a lot more susceptible to radiation and yet are not mentioned to date in any of the assessments material provided. It has been recommended for the last 10 years that children not receive cerebral CT scans because of the radiation dose involved.

What are the risks associated with radiation exposure for children?

Radiation exposure is a concern in both adults and children because of an increased risk of cancer, however there are two unique considerations in children: **1. They are growing rapidly and more cells are dividing, providing a greater opportunity for radiation to disrupt cell development. 2. Children have a longer life expectancy, giving a longer time for the effects of any radiation damage, if present, to influence long term health.**

Recent studies indicate that the statistical risk of developing cancer from a CT scan is about one in a thousand, however our knowledge is still evolving about the extent of the risk. This risk varies with age, size of the child and the part of the body scanned.

ARPANSA March 2015.

If this project were to go ahead, there will need to be a mandated, strong management plan that details responsibility for radiation training and work protocols, reporting mishaps, worker dosage monitoring, transmission of results to ARPANSA and response to high dosage readings.

The risk is that the actual on-site works will be subcontracted out to employers who may not be aware of the radiation risks and management. As Victoria discovered last year, with the Hotel Quarantine system, subcontracted workers may not fully understand or implement the rules they are supposed to be working under.

The supporting information from Kalbar does not mention dosage monitoring of workers, but rather monitoring at various places on site. This will not adequately monitor the actual dosage of radiation received by each person. Radiology department staff in hospitals wear monitor badges. Surely something similar could be provided for staff members?

This should also include truck drivers, transporting concentrate.

Handing over the training and risk management for health and radiation monitoring for workers and those involved in transport, to middlemen, is a dangerous way to proceed, for these workers. It is important that Kalbar takes full responsibility for all stages of employment on its operations.

The company must at all times be accountable for long term health effects on workers.

They have recently changed their company structure which now appears to be largely foreign owned. We all remember the James Hardy scenario where the company moved offshore to a different jurisdiction thus avoiding responsibility for compensating injured workers. If this operation went bust or on sold the operation to others, there needs to be some chain of responsibility for workers.

I note that notwithstanding the advice from the Department to the IAC, the response from Kalbar to my original submission was that ARPANSA recommendations not yet legislated in Victoria, need not be followed. This was in relation to my pointing out that the recommended dosage for 16 to 18 yo workers was 6 milliSv not 20 as allowed for adults. Yet on Kalbar's website, they patted themselves on the back for offering work to First Nations school-leavers. It is likely that they will employ some workers who are in this age range.

I was somewhat taken aback at this attitude.

Similarly, how will they manage risk for pregnant workers on site?

ARPANSA has now published Australia's Action Plan to implement the findings from the review, following endorsement by the Australian Health Protection Principal Committee (AHPPC) in December 2020.

R21¼ The Planned Exposure Code (RPS C-1) is to be revised to include the following:
o specific dose limits for apprentices and students from 16 to 18 years of age.

ARPANSA, in conjunction with state and territory regulatory bodies, should revise the current requirements on occupational radiation protection to ensure compliance with IAEA Safety Standards GSR Part 3.

PAM Flocculant

PAM used as a flocculant in drinking water treatment is maintained at a concentration <1mg/L (US), ensuring that the concentration of acrylamide monomer in the treated water is less than 0.5ppb (w/v). The European Commission (EC) has a stricter limit of 0.1ppb (w/v) acrylamide.

PAM degrades by photolytic processes and Biodegradation:

In the former, Sunlight breaks down the polymer releasing Acrylamide, particularly in the presence of iron or titanium. As has been suggested this may affect dust suppression on haul roads.

The other way that PAM may be broken down is by microorganisms in the soil. It does appear that this is an area where papers find opposite results, so that it could be said

that the science is not settled. There needs to be a process built in which changes the usage as the science develops.

Acrylamide is a carcinogen and neurotoxin.

This aspect needs to be treated with utmost caution.

There may also be release of Nitrogen oxides which may contaminate drinking water. Babies can develop methaemoglobinaemia due to nitrites and appear dusky due to binding of the haemoglobin molecule, reducing their ability to carry oxygen around the body. Chronic exposure of young children may also be related to developmental delays or disability.

Mental health.

People have been living with the threat of having their lives turned upside down for the last 5 years.

Each person responds in different ways, and has different concerns imposed upon them, so their responses may present in a wide variety of ways. Responses ranging from sadness and depression, to anger and anxiety are just the tip of the iceberg.

At the very least, the arrival of Kalbar has been stressful. Years of stress increases cardiovascular risk (heart attacks and stroke).

Having no say in what happens to you is also harmful.

Importantly, chronic stress can affect subsequent generations via epigenetics.

NOISE

This will affect nearby residents and the transport routes will also be impacted by truck movement noise. I lived 3 blocks from a roundabout on the Princes Hwy in Sale for a period. Some nights, I heard every truck braking as they rounded that intersection. It is not negligible and a surprising number of trucks travel that road all night long.

Chronic noise exposure adds to the stress levels.

Noise levels sufficient to cause damage to hearing are most likely for workers on site, but not the general public.

CLIMATE CHANGE

Global Warming is noted by the Lancet to be the greatest health threat of the 21st century, so it needs to be factored in to any planning around this project.

TRANSPORT:

There seems to be no clear plan as to transport of HMC to port. Will it be trucked or trained? It will be in half filled containers and apparently still wet, so it will be enormously heavy (and demonstrates that a fair bit of water will actually leave the site). It then mysteriously gets left in a warehouse and at some point is de-containerised prior to shipment.

This gives rise to a whole chain of concerns. It is simply not good enough for Kalbar to say, "Don't you worry about that - it will all be dealt with in the Radiation Management Plan" Our communities will all have daily loads of HMC passing through. I note that even the Shire of Wellington prefer rail to truck transport.

Regular users of our rail service will know how often we are put onto buses for various reasons. I would also note that funding has been approved to complete the highway duplication through Kilmany where there is a railway overpass which will obviously affect both rail and road transport in the coming years, often for many months at a time.

Once in Melbourne, Gippsland line trains travel on the suburban network including through Richmond, Flinders Street and Southern Cross stations if the final destination is Geelong. Has anyone in Geelong community been consulted. I very much doubt they have had the opportunity to realise their need to make a submission to this EES process. Surely they deserve to have a say in this?

In Geelong if wet HMC is dumped, how will they prevent run off water entering Corio bay? If the HMC is dry by the time it leaves our shores, then loading will lead to dust which will be a hazard for local communities and particularly waterside workers. Should they then be wearing dosimeters?

COVID Note.

During 2020 workers from Melbourne which was supposedly behind “a ring of steel” were regularly visiting properties in the area asking to undertake works on people’s land. Gippslanders felt safe with no cases in the community but it could easily have been otherwise. It beggars belief that they were considered an exempt industry and could have been spreading COVID to east Gippsland. The community struggles to feel that this is essential work. Given that Kalbar claims it will provide jobs for people in the area, surely they should have been employing local people.

In the current environment with Melbourne locked down over a far more spreadable variant of the pandemic virus, surely for a company wanting to be seen in a favourable light they need to manage COVID risk in a public manner, and actively limit movement of workers from outside of regional Victoria.

Finally, I believe that the potential health impacts of this project are so significant that it should not proceed at all. If it does there needs to be high level oversight of the project throughout its life, by qualified Independent health experts.

There will need to be transparent information sharing with the public, **Not** just as a subclause of an annual report tabled in parliament once a year