Rebuff: Paper - Long term plant biomonitoring in the vicinity of waste incinerators in The Netherlands

Introduction

Veolia has tendered a 2014 paper entitled, ***'Long term plant biomonitoring in the vicinity of waste incinerators in The Netherlands'*** presumably to allay or dismiss the objections of we the people in the greater Tarago region to the health and environmental hazards from the by-products of the operation of the waste incinerator they seek to construct at the Woodlawn mine site.

The people reject the notion that said paper and the research it represents:

1. is adequate in addressing the toxic hazards that would emanate from the proposed Veolia Woodlawn incinerator development,
2. is adequately representative of the environmental, geological, and meteorological conditions pertaining in and around the Tarago region, and
3. was independently derived and was free of commercial influence to produce an outcome satisfactory to the incineration industry.

In rejecting its conclusions, this response does not attempt to refute the chemical methodology used to test samples. Rather, this response refutes the research independence and design of the project and the irrelevance in the way Veolia seeks to imply relevancy of incineration deposition conditions of a wet and breezy sea-level Netherlands, to a drought-prone hilly land that is 700 metres above sea level.

We are not embarrassed to rebuff this paper. We will not just keep in our place when confronted with paid for junk science. We think enough has been learned about the operation of biased science in the past few years that we no longer elevate it above our own observations, knowhow and commonsense. We don't need experts to tell us that water is wet, and if they tell us it is dry, we will not accept that falsehood.

The Project's Irregular Construction

With regards to this paper, the initial fundamentals one would expect from a 'scientific' paper are missing.

1. There is no disclosure by the authors of any pecuniary interest or lack thereof.
    a. For example, Grants, Sponsorships, Employment, Contracts, Commissions, In-kind Gifts, Pledges or Donations to Universities, and so on.
2. There is no evidence that the paper has been independently peer reviewed.
3. The paper claims to have run a study over the course of 10 years, at 21 test locations (15 vegetation, 6 bovine), but does not disclose who funded the study.
    a. It is likely that such a study would have cost more than one-hundred-thousand dollars.
    b. Who paid for that and why?
        i. For obvious reasons, it is unlikely that the farmers or the university paid for the study.
        ii. That leaves either incinerator operators or an approval authority, under pressure from the locals. The paper's Abstract implies this assumption by saying:,

            "Although the incineration plants must comply with strict conditions concerning emission control, public concern on the possible impact on human health and the environment still exists"

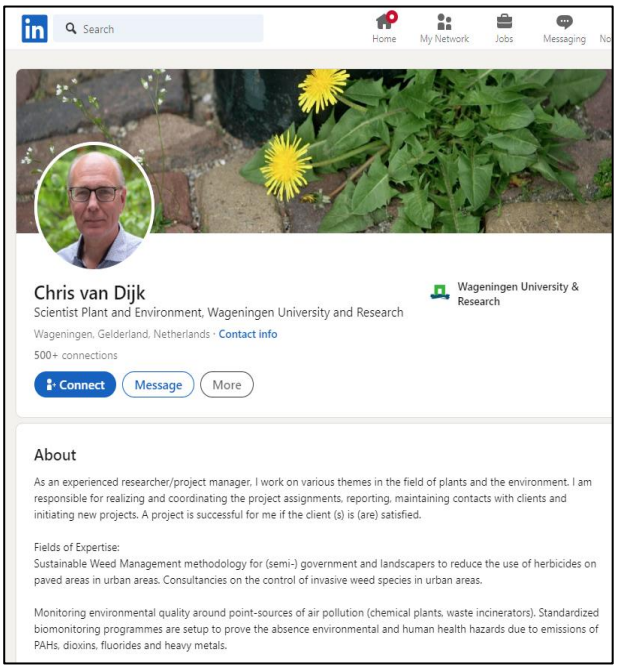
        iii. This statement is a concern because the 'research' was performed after the three incinerators were constructed. That implies the locals' concerns were substantial enough that either the operators or the authorities required some evidence to allay them.

            Given the incinerators were constructed and operational, there would have been only one acceptable outcome from such a report for the operators and the approval authorities – a report that appeared to validate all was OK with the emissions.
4. There is no control group for the tests outside of the region where the testing occurred and where there were no waste incinerators or other similar pollution generators.

5. No data is provided for what was incinerated at the facilities.
    a. We might presume from the closing statement in the paper that incinerator operators were aware of the sampling locations and timings, by the congratulatory wording,

        "The authors would like to thank the representatives from the companies and LTO-Noord for their valuable contributions to the discussions in the advisory commissions over the years."

    b. It is common knowledge that industries will turn-down output before an important event like the Olympics or an international global conference to have otherwise polluted locations (like Beijing or Los Angeles) appear pristine. We'd assert that the stakes from the outcome of this paper were so high for the operators that one can't exclude extra attention to the incinerated waste fraction in the run-up to each test. But even without ascribing Machiavellian intentions, the absence of knowing the incineration feedstock composition limits the transparency of the paper's assessment.
6. There is no meteorological data relative to influencing the sampling outcomes such as wind, rain, snow, temperature, inversion elevations.
7. In such a paper, the first author in the list is the Head Author – the boss of the paper. In this case it is **(CJ) Chris Van Dijk**, who appears to be associated with Wageningen University & Research. The university website states he is an experienced researcher/project manager, although no credentials are attributed to him such as Phd, Dr. or Professor. Link.

    Of serious concern is that his profile states, *" I am responsible for realizing and coordinating the project assignments, reporting, maintaining contacts with clients and initiating new projects. A project is successful for me if the client (s) is (are) satisfied."* This is repeated on his private **Linked In** profile.

    The profile goes on to entice with the words,

    "Monitoring environmental quality around point-sources of air pollution (chemical plants, waste incinerators). Standardized biomonitoring programmes are setup to prove the absence [of] environmental and human health hazards due to emissions of PAHs, dioxins, fluorides and heavy metals."

    So right up front, the research manager is proposing outcomes to **prove the absence of human health hazards**. There's no if ands or buts about what's for sale here.

    This concern is compounded by the university's page that seeks private 'collaboration'. It states, *"As a company, social organization or government, you want to commit to a more sustainable world, healthy food and a healthy living environment for people and animals worldwide.*

    Then we would be happy to work with you. At Wageningen University & Research (WUR) we have a lot of knowledge, technology, facilities and ideas that we are happy to use and, together with you, create value for society. Do you see opportunities for collaboration? Please contact us today."

    The implications of both the researcher and the university soliciting commercial "collaboration" (paid research) are that the client will get the result they are looking for. The result they pay for.

So, we can reasonably assume this paper came about as a result of:

a. The incinerator operators were having post-opening problems with the communities and therefore the authorities.

b. They needed some "science" that would get them and the authorities who approved and used the developments, off the hook.

c. They had a research university that acknowledged commercial realism using the coded commercial language *"to create value for society",* and a project manager who openly states that his *biomonitoring programmes are setup to prove the absence [of] environmental and human health hazards due to emissions of PAHs, dioxins, fluorides and heavy metals.* He is *successful when the client is satisfied*.

The preamble and the subsequent faults we set out below, compel us to say this report is 'junk science', and even if it were not, Veolia's attempt to imply applicability of incinerators located next to the windy North Sea, in one case meters away, at an elevation of -1 to 1 meter to sea level, to Tarago conditions, is grasping at straws, irrelevant, and non-sense.

Junk science doesn't require a researcher to lie to make a client *satisfied*, although that is known to happen. It only requires a research project that appears to be 'scientific enough', and then apply subjective interpretation to gaslight a desired outcome.

It's somewhat difficult to address a paper once one considers it to be contrived. However, we'll address a few of the more egregious points in the paper, which we believe do not satisfy the issues the people of the Tarago region have with the hazards and dangers inherent with Veolia's proposal to develop an MSW incineration plant at the Woodlawn mine site.

Waste Incinerators Produce Toxic Emissions

In section 3.2.1 of the paper, its authors acknowledge,

> Farmers and residents living nearby the installations | *"**Emissions from waste incineration plants contain components that are potentially toxic for humans, plants and animals**. Major concerns often exist concerning the group of persistent organic compounds ('dioxins')."*
>
> *"Major resistance also occurred in this case, when de [sic] plans for building these facilities became public. **Whether the fear for health effects was justified cannot be answered with certainty**. The results of various studies on the causal relationship between human health effects (reproduction, cancer, respiratory and heavy metals in the body) and **exposure to emissions from incinerators are inconclusive** (Hu and Shy, 2001; DEFRA, 2004)."*
>
> *"Furthermore, **there are continuous reminders (noise, smell, smoke)** of the closeness of the installation which requires extra effort (stress responses) to minimize the risks **and adapt to this permanent threat** (Lima, 2004)."*

We concur that people living near incinerators are exposed to emissions containing components that are toxic for humans, plants and animals, and we concur that there are continuous reminders that perpetuate a permanent stressful threat to them.

However, we do not concur with the off-handed treatment that the hazardous health effects are uncertain or inconclusive. To express this is, in our view, manipulative on the part of the authors. There is no doubt that emissions from incineration plants contain toxins that ARE hazardous to humans, plants and animals. The only question is how much is emitted and how persistent are they. There is a substantial body of scientific evidence and consensus that highlights adverse health effects associated with exposure to incineration emissions. While scientific understanding may involve some level of uncertainty, there is a significant amount of well-established knowledge regarding the health risks associated with certain pollutants released during incineration.

There is certainty that incinerators will have such emissions during the best of their controlled operations. During times where anything but the best operational controls are occurring, the bioacumulative stack emissions can pose prompt and deadly hazard to all of earth's biology and resources the winds carry them to. This is reality.

The Paper Measures Growing Season Absorption, Not Accumulation

The kale and spinach leaf absorption tests did not measure the bioaccumulation deposition of the stack emissions in the landscape and waterways.

The tests were designed to isolate the plants from the actual agricultural biosphere by containing them in a potted environment, with each sampling location set up with anti-rooting plastic and surrounded by a 1-metre-high windscreen and fence.

We don't doubt that kale and spinach can act as accumulators as set out in the paper, but we do doubt that under the conditions of this research, including their location at sea level in a breezy and precipitous region, that the measurements would accurately reflect the total deposited emissions from the stacks as those emissions would be encountered by actual Dutch agricultural landscapes, much less those that would apply in the greater Tarago region.

It is not stated in the paper, but we presume the kale and spinach were planted annually in fresh pots. Doing so would further distance the test vegetation from the real-world deposition of stack pollutants into soils and ground water, which are taken up in productive plants through their root systems over the course of years.

Additionally, the tests as designed did not inform any data on the effects of deposited emissions in the subsurface biota, which are fundamental to healthy and nutritious flora. We assert, it is the nutrition that plants can pass up the food chain that is critical to agriculture, and hence civilisation, not just that a plant itself can survive toxic assaults.

Test Was for Absorption, Not Nutrition

While we view the testing methods, as designed, were inadequate to expose the full cumulative deposition of the stack emissions, according to the paper they only tested a limited catalogue of incineration toxins, which according to the author's do not exceed permissible limits except for Fluoride.

What wasn't tested was the change in the nutritional composition of the plants: a) nutrients displaced by up taken emissions, b) the effect of emissions uptake on plant metabolic processes, and c) the availability of the plant nutrients to livestock or human consumers in combination with the plant's toxins uptake .

As the paper shows, plants can take up various substances from air (and soil), including heavy metals and other pollutants. These contaminants can accumulate in different plant tissues. It is known that contaminants can interfere with the normal metabolic processes of the plant and can lead to changes in its nutritional composition.

Mercury and cadmium pollution can potentially replace essential nutrients in plant tissues or disrupt the synthesis of certain compounds. Both can be toxic to plants. Here's how:

1. **Replacement of Essential Nutrients**: These and other heavy metals can be taken up by plants in a manner similar to essential nutrients such as zinc or iron. The problem arises when these metals are absorbed and accumulate in plant tissues in place of essential nutrients. This substitution can interfere with normal metabolic processes and lead to nutritional imbalances.
2. **Disruption of Enzyme Activities**: Mercury and cadmium can disrupt the activity of enzymes involved in various biochemical pathways within plants. Enzymes play crucial roles in catalysing reactions that are essential for plant growth and development. When heavy metals interfere with enzyme function, it can disrupt normal physiological processes.
3. **Inhibition of Photosynthesis**: Both mercury and cadmium can inhibit the process of photosynthesis, which is crucial for the production of carbohydrates and energy in plants. This inhibition can result in reduced plant growth and productivity.
4. **Alteration of Plant Metabolism**: Heavy metal contamination can alter the overall metabolism of plants, affecting the synthesis of compounds such as proteins, lipids, and carbohydrates. This, in turn, can impact the nutritional composition of the plant.
5. **Formation of Reactive Oxygen Species** (ROS): Mercury and cadmium can induce the formation of reactive oxygen species (ROS) in plant cells. ROS can cause oxidative stress, damaging cell structures and impairing normal cellular functions.

The impact of mercury and cadmium on plants can have cascading effects on the food chain, as these contaminants can be transferred to animals that consume contaminated plants. This bioaccumulation can lead to higher concentrations of heavy metals in organisms at higher trophic levels.

Accumulation in the Consumer

Aside from the direct effect of emission toxin on themselves, their families and livestock, Tarago region farmers and growers are also concerned in the reduction of nutrient value of crops and foods. When toxins and pollutants are absorbed into plants they can react with the nutrients, affecting their availability and/or potency.

In turn, the absorption of toxic emissions from waste incinerators by plant vegetation can affect the nutritional value of the plant and the bioavailability of nutrients to its consumers. The impact would largely depend on the contaminants, their concentration, and what plants do in that onslaught.

Contaminant Uptake: Plants take up various substances from the soil and air, including heavy metals and other pollutants. These contaminants can accumulate in different plant tissues.

Nutritional Changes: If the contaminants interfere with the normal metabolic processes of the plant, it can lead to changes in the nutritional composition of the plant. For example, heavy metals might replace essential nutrients in plant tissues or disrupt the synthesis of certain compounds.

Bioavailability to Consumers: When animals or humans consume contaminated plants, the contaminants can be transferred to them. This transfer can affect the bioavailability of essential nutrients in the diet. Some contaminants may inhibit the absorption of essential nutrients or even pose direct health risks.

These remarks specifically focus on humans and animals, but the effects of accumulative toxin deposition into a biosphere are hazardous and life threatening to all lifeforms including the microscopic, without which life as we know it ceases to exist.

Implication of Rain and Wind on the Test Plots

The Netherlands has a maritime climate with precipitation distributed throughout the year, there is no particular dry or wet season[1][2]. Certain regions, such as the coastal areas where two of these incinerators were located, may experience higher rainfall compared to inland areas of the country.

The researchers tested absorption of selected suspended particles on leaf surfaces. However, since the test regions receive an average of 800mm to 1000mm of rain per year across and average of 217 days[3], reliance of absorption from the leaf surfaces isn't a reliable measure of the full toxic potential from the stacks. In such meteorological conditions leaf surfaces may be regularly washed clean by precipitation and wind.

It is not for nothing that the Netherlands is called the Land of Windmills. The weather is very changeable, and the wind blows almost all year round.[4] On the Beaufort Wind Scale, the region of the incinerators is generally considered Level 5 – Fresh breeze – 8.5-10.5 m/s

The authors stated, "*A 1 m high fence and windscreen was set up to protect the plants against rabbit herbivory and wind damage.*" This statement raises two questions we think are significant in considering the validity of the conclusions later expressed by them.

[1] Weather in the Netherlands - Lifeport Welcome Center

2 https://globalwindatlas.info/en/area/Netherlands

3 https://www.amsterdam.climatemps.com/precipitation.php#:~:text=On%20average%20there%20are%20217,per%20month.

[4] Weather in Holland - Flymeto

The first is that a 1-metre-high screen around the plant would have the effect of reducing exposure of the plant to atmospheric particles, with a percentage of them blowing past the sequestered space.

The second is the implication that the test plants might be damaged by wind, so much so that, a screen must be erected around the plant. This implication underscores our assertion that rain, now combined with winds strong enough that a plant needs protection against, would result in assertive washing of leaf surfaces, resulting in under absorption of atmospheric particle pollutants.

In these real-world meteorological circumstances, relying upon what is absorbed by a kale or spinach leaf, grown in a windy and precipitous region, as the final word on the deposition of stack emissions in the biosphere is utterly inadequate and fallacious.

Maximum Allowable Concentration

Throughout the paper, the authors use phrases like, “generally did not exceed maximum allowable concentration" or “no maximum concentration has been established”.

It is of no joy to the community to have flora and fauna that contain toxic emissions. It doesn’t change their view if an authority says they don’t exceed a maximum ‘allowable’ concentration, particularly when those toxins accumulate in soils, waterways, livestock, and humans that eat produce or live in the exposure area. It’s even worse when a toxin such as mercury is a metal known to biomagnify, that is, progressively accumulate as it passes through the food chain[5] (WHO 1989).

Once metallic mercury has entered the environment it can be methylated by micro-organisms, found for instance in aquatic sediments, into organic forms of mercury, most commonly methylmercury. In this form, it can cross cell membranes easily and quickly enters the aquatic food chain. From here it may enter the human food chain. Exposure to methylmercury has resulted in permanent damage to the central nervous system, kidneys, and developing foetus.

They took no responsibility to test soils and waterways, over the term of the paper’s period, for toxin bioaccumulation.

We the people of greater Tarago region look beyond ‘allowable concentrations’. We know that for time and memorial such concentration levels for toxins are lowered or eventually banned, as the public and authorities become more aware of their harms, and commercial and political obfuscation begins to fail. Contributing to the change are:

1. **Obvious Observations:** The observation and recognition of the accumulation of adverse biological outcomes in people, livestock, and wildlife that are beyond what previously was an expected norm. This could include cancer outbreaks, miscarriages and infertility, mental derangements, weakening, loss of avian and other lifeforms to mention a few.
2. **Advancements in Research:** Ongoing scientific research providing insights into the health and environmental impacts of various toxins. New studies may uncover previously unknown risks or identify lower levels at which adverse effects can occur.
3. **Technological Advances:** Advances in analytical techniques and technology that enable more accurate detection and measurement of contaminants at lower concentrations. This increased sensitivity influences the establishment of lower allowable limits.
4. **Cumulative Effects:** As affected people, scientist, and political representatives better understand the cumulative effects of exposure to multiple pollutants or the long-term impacts of chronic exposure, regulatory standards are adjusted to account for these complexities.

[5] https://www.who.int/news-room/fact-sheets/detail/mercury-and-health#:~:text=Once%20in%20the%20environment%2C%20mercury,Methylmercury%20also%20biomagnifies.

The Battery Problem In Our Future

As a society, we are on the verge of a battery future. Batteries in our vehicles, appliances, devices, bodies, computer and home UPSs, and bespoke domestic and industrial designs and applications. There is hardly anything more toxic in a waste stream to incinerate than batteries – mercury, lithium, cadmium, nickel and the like.

The authors of the paper state:

> *"Vapour phase Hg [mercury] is **mainly due to the incineration of discarded batteries** (Bergström, 1986), and domestic solid waste in The **Netherlands contains only 0.03% discarded batteries** (Ministry of Infrastructure and Environment, 2013) due to a **high degree of battery recycling**.*
>
> *"This could well be **an explanation for the relatively low Hg levels found in spinach and kale**. Furthermore, **gaseous mercury is distributed over a larger area** than particlebound cadmium. These findings are consistent with low Hg concentrations found in lichens around an incinerator in central Italy (Loppi et al., 2000).*
>
> *"**No maximum acceptable Hg level for leaf vegetables has been defined**."*

We do not take issue with these statements. We do want to accentuate the very low levels of discarded batteries in the Netherlands, which is not the case in Australia, and the disclosure of gaseous mercury deposition being distributed over a larger area. Presumably, they report this to flag their plots could not have been exposed to the full Hg emissions coming out of the stacks. If that is the case, then the tests are invalid for purpose. Furthermore, the authors sidestep the 'elephant in the room' of our all-electric future – lithium from lithium-ion batteries.

The incineration of lithium-ion, nickel, and cadmium batteries pose hazardous health and environmental risks. The largest growing battery type is lithium-ion. CSIRO forecasts Lithium-ion battery waste is growing by 20 per cent per year and could exceed 136,000 tonnes by 2036.[6] As the Sydney-Canberra corridor has about 26% of Australia's population, that would be 35,000 tonnes of lithium-ion batteries to dispose of and growing!

While escaped mercury gas emissions are deadly, so too are lithium emissions. Lithium-ion batteries contain metals such as lithium, cobalt, and nickel. Concerns associated with the incineration of lithium batteries include toxic emissions such as harmful fluorine and sulphur compounds particulate matter. Battery incineration also can be released into the air as fine particles of lithium, cobalt, and nickel. The emissions pose risks to human health while metal particulates contaminate soil, water, and pose risks to ecosystems, food chain, and lifeforms.

Incomplete combustion during the incineration process leads to the release of hazardous by-products. The combustion of certain materials in batteries can result in the formation of dioxins and furans, which are persistent organic pollutants with known environmental and health harms.

According to Canadian recycler **AEVITAS**[7],

> *"Mercury batteries must be heated to 700 F in a mercury retort oven which causes their mercury to fume off as a vapour, which is then recovered and condensed. The mercury is then triple distilled to produce pure elemental mercury."*
>
> On the other hand, *"Lithium batteries must be cooled to -325 F in order to deactivate the lithium within them, then the batteries are shredded and neutralized. Their lithium salt is reclaimed and sent for refining into lithium metal for reuse."*

In either case, it is our reasonable assessment that no batteries belong in a MSW incinerators. For mercury batteries, the necessary temperatures cannot at all times be maintained, nor can the vapours be captured, much less recycled. For lithium batteries, Veolia's propose incinerator has no ability to properly process and recycle the associated metals at ultra-low temperature, leaving incineration the only options for these batteries that flow in from MSW.

No doubt, Veolia will protest that batteries should not be in MSW feed stock, but that is shear wishful thinking. In section 3.3 of the paper, the authors state, regarding incinerator feedstock, *"exact composition is not always known."* We agree 100% with that statement, and we would go even further to say that in no reasonable timeframe will that ever be possible, including for any toxic metals.

[6] https://www.csiro.au/en/research/technology-space/energy/energy-in-the-circular-economy/battery-recycling

[7] https://www.aevitas.ca/battery-recycling.html

According to CSIRO,

> *only 10% of Australia's lithium-ion battery waste was recycled in 2021*![8]

Where did the other 90% go!

Lithium-ion batteries are notorious for their flammability. If not properly handled during incineration there is a risk of explosions that can disable control equipment, releasing even more hazardous materials into the stack emissions than best case control might contain them to.

However, pre-incineration ignition is another real danger. As the volume of lithium batteries find their way (legally or illegally) into MSW the potential for them to ignite in a staging area can't be dismissed. Were that to happen, there would be no toxic emission mediation before reaching the atmosphere. As has been well published, lithium battery fires to not respond well to extinguishing with water, often only accelerating their toxic emission deposition in the surrounding environment.

If for no other reason, waste incinerator development across the country must cease, so as to prevent the inevitable incineration of waste batteries. So long as batteries can 'disappear' into the waste stream leaving an urban area that is uncooperative toward recycling, then recycling will lose out to expediency. And, health and the environment will lose out to incineration.

Sites Selection

The authors say, "*A general dispersion model (STACKS) was used to predict the distance where the plume would reach the ground under the prevailing wind direction (southwest).",*

We think it would be challenging to reliably make such a prediction at locations where the wind speed varies as much as it does in that region so close to open ocean.

They also say, *"Cow milk was sampled at two dairy farms (4 samples per year) in the vicinity of each incinerator to determine the concentrations of dioxins (PCDD/PCDF) and dioxin-like PCBs. Farms were selected where the cattle had mainly grazed in the maximal deposition area* ***or acquired part of their forage from that location****."*

However, they don't disclose the actual distances or direction from the incinerators. Were there two dairy farms in all three test regions? That density would be unusual in Australia, but perhaps not in Holland.

The location of the incinerators around which the test plots were located were:

1. Alkmaar at elevation of 1m above sea level, 8km east of North Sea
2. Harlingen at elevation of -1m below sea level, on the Wadden Sea
3. Wijster at elevation of 25m, 85km south of North Sea

These are hardly representative of Veolia's propose Woodlawn site with its 85-metre stack at an approximate ground elevation of 780m, with these affected communities' land elevations being:

695 m at Tarago,

693 m at Bungendore,

633 m at Goulburn,

574 m at Manuka, and

618 m at Queanbeyan

Figure 1 Click on circle to link to site

With 26% of the country's land area below sea level, and approximately 60% vulnerable to flooding, The Netherlands has few affective landfill options, hence its large use of incineration. The trade-off is the Netherlands has amongst the worst air quality in European countries, according to the 2022 AQI COUNTRY RANKING. (link)

No Control Sites

Whether intentional or an oversight, the authors did not provide a control for their recordings that was not in the vicinity of a waste incinerator or other pollution emitter. As such there is no way to know from the paper what a true unpolluted normal is or could be.

They instead rely on background levels of the same area they are measuring to attempt to establish a strawman that their plot measurements are normal. This technique is like that used by Covid vaccine producers, where their tests were compared to humans vaccinated with another product, verses a control of not being injected at all with a product. The world is awakening to the serious shortcomings and deadly hazards of that type of no-control control testing which do not come to light to the public and the regulators, until irreversible death and injury has spread across civilisation.

Using their no-control control method, all the measurements they present in the paper, with the exception of fluoride, are claimed to be normal by that comparison. But even with fluoride they dismiss its elevated significance out of hand – they say, *"fluoride is even intentionally added to drinking water and toothpaste"*.

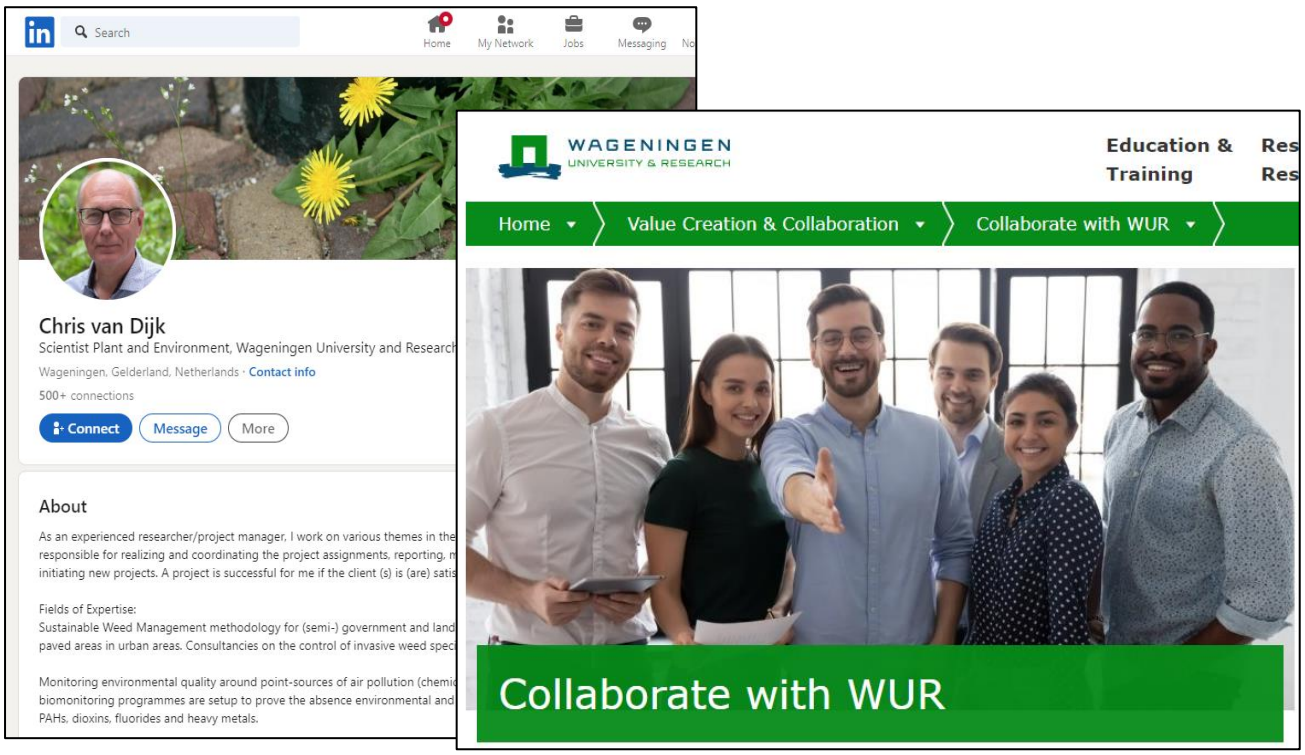
Getting the *Satisfaction* That Was Paid For

It's hard to read section 3.2.1, without disrespecting the authors for getting out of their lane and the covert contempt they express toward farmers. The implication of their writing is that the problem is in the farmers' head. The farmers' fear is psychological, and their ability to grasp science is limited unless it is brought down to "ground level". Quoting Elon Musk at this point could be called for but restraint will be exercised.

Belittling the farmer's intellectual capacity is what junk science needs to do, so its conclusion, that was paid for, can seem to take the higher ground. In this case, "*the predominantly positive results (no effect) from the biomonitoring programs during the past decade have contributed to less uncertainty concerning health effects by neighbouring farmers and residents*."

In section 3.2.2 the authors go the extra mile for the client with a public relations pitch for the incineration industry. Totally uncalled for from the project's credibility, but totally understandable to "*create value for society*".

In section 3.3 they have a go at pitching their next contract saying, "*a strong argument for implementing new or continuing existing biomonitoring programs*." "To prove the absence of environmental and human health hazards due to emissions of PAHs, dioxins, fluorides and heavy metals," words we would add from the head author's profile for completeness.



Rejection of Conclusions

The authors' pertinent conclusions were:

> "*Concentrations of heavy metals, PAHs and dioxins/PCBs were generally similar to background levels and did not exceed standards for maximum allowable concentrations in foodstuffs (e.g. vegetables and cow milk). The results also show that there is no potential risk with respect to human consumption quality of the investigated crops and products in the vicinity of the incinerators."*

We reject that the conclusions of this paper have any meaningful correlation or application to Veolia's proposed MSW incinerator development at Woodlawn mine.

We doubt the project was designed without undeclared interests that would benefit the incineration industry and the authors or their employer(s).

Even if the design of the tests had been able to provide certainty that all emission deposition would have been recorded, which we do not believe it was, then we would reject the conclusions of this paper that was written for stack emissions in the western region of The Netherlands:

- due to the significant meteorological and climatic differences between the Tarago region and North Sea communities making a comparison of the toxic deposition modelling is utterly inadequate and fallacious;
- due to the limitations of the tests conducted to measure the waste toxins Australian society is facing in 2024 and beyond, including storage battery waste and Perfluoroalkyl and Polyfluorinated Substances (PFAS);
- due to the reality that the consistent toxic fluoride measurements are serious persistent and are biomagnified in the environment, and are not to be dismissed (as the authors did) without adequate causal investigation;
- due to the authors' claim of no risk to human consumption without human examination being in the design;
- due to the project failing to provide a control for the test that was outside of the region being tested; and
- due to the failure of the authors to declare who paid for this expensive study and whether the authors or their employer had any undeclared pecuniary interest associated with the project.

There is nothing that we have said here that be believe Veolia would not have understood prior to submitting this paper to us. As such we interpret their action as being disrespectful.

MSW is an uncertain commodity today and will become more so if urban areas are provided incineration for its disposal verses recycling. This is no more critical than with the disposal of batteries, electronics, and solar panels. CSIRO states that only 10% of lithium batteries are recycled. Of the other 90% it will be certain that some portion of that will be in MSW. It is well known that MSW source-separation does not work in some communities and accommodation types. Source-separation is not a silver bullet to assure heavy metals would not be incinerated if Veolia's proposal were to proceed.

It does not matter how good Veolia's intentions are to build, maintain, and operate a gas-tight – dioxin free, PFAS free – incinerator for the next 30 years, it will not achieve a gas-tight lockdown all the time for all the baddies.

Recycling is THE answer to such waste, not incineration. Even if the proper recycling infrastructure isn't available today, it is better to sequester materials like batteries, electronics and solar panels in a segregated land fill that can be mined in the future. Incinerating these resources not only poisons that environment and is hazardous to all things living, but it vaporises these valuable raw resources, never to be recycled, ever again.

If for no other reason, waste incinerator development across the country must cease, to prevent the inevitable incineration of electrical associated waste. So long as batteries can 'disappear' into the waste stream leaving an urban area that is uncooperative toward recycling, then recycling will lose out to expediency. And health and the environment will lose out to incineration.

It's often said that society should rely on 'the precautionary principle' when in doubt considering a matter that might cause health and environmental chaos. With Veolia's proposal there is absolute certainty that incinerators will have such emissions during the best of their controlled operation periods. During times where anything but the best operational controls are occurring, the bioacumulative stack emissions can pose prompt and deadly hazard to all of earth's biology and resources the winds carry them to. That's not just precautionary, that is reality.

To the NSW authorities, we reaffirm our well-considered and strongly held position, that an MSW incinerator must not be approved for Woodlawn at Tarago, less the damage to our lives, our enterprises, and our environment be placed on the highest risk footing, which is totally unacceptable to us and the greater community.