Submission No 421

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

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Date Received: 31 October 2025

URBAN GARBAGE RURAL DISPOSAL

The issues raised by the practice of disposing of garbage generated in urban districts in New South Wales by transporting it to distant rural locations which have relatively lower populations are multiple. A basic issue is that of fairness given that the recipient locations almost invariably have smaller populations than those of the suburban donors. One inevitable consequence of this invariable disparity is that it is reflected in considerably greater political influence. Votes count. NSW should represent much more than the interpretation expressed in rural local government namely 'Newcastle, Sydney and Wollongong'

Aside from the basic issue of fairness there will invariably be other reasons for a rural community's objection to being identified as suitable recipients of garbage produced by a distant suburb. The precise extent to which any of these issues is responsible for rural opposition to garbage 'trading' is likely to vary with the recipient location.

The account which follows relates specifically to the Veolia facility adjacent to the village of Tarago and is concerned with one specific aspect of community health. Whilst not conceding that all is well apart from this specific issue (far from it) the following account is intended to address a single issue. That issue relates to potential uncontrolled release of nanoparticles from the facility proposed by Veolia. Were this to occur it could result in chronic pulmonary disease several decades later affecting children currently attending the Tarago primary school.

WHAT ARE NANOPARTICLES?

The term 'nanoparticle' refers to particles which are one thousandth of the size of a micron, that is one thousandth millionth of a metre. A common source of nanoparticles is the breakdown of plastic waste. As will be outlined below these particles once inhaled will inevitably gain access to the innermost airways and can elude the biological mechanisms which can arrest the entry of larger particles to these innermost airways. A consequence of the permanent retention of nanoparticles deep within pulmonary tissue is that this is highly likely to produce long term pathological changes in those tissues. The nature of those changes and their recognition as documented in medical literature will be described below. This will be followed by an account of the detection, let alone the removal, of nanoparticles from emissions.

WHAT ARE THE DOCUMENTED NATURE OF DAMAGE TO PULMONARY TISSUES BY NANOPARTICLES?

One consequence of their very small size is that nanoparticles are able to enter spaces which are inaccessible to larger particles. The tubes which carry air into the lungs (the bronchi) connect with progressively smaller ones (bronchioles) and ultimately with minute cavities (alveoli) from which inhaled air gains access to circulating blood. Inhaled air can transit through the alveolar membrane walls to enter the bloodstream. 'Conventional' particles which have been generated in the course of industrial processes such as those involving asbestos and silicon are likely to be trapped by very small hairs (cilia) which line the bronchiolar walls until the

bronchioles reach the alveoli. After varying intervals the presence of these entrapped particles and the pulmonary damage, especially fibrosis, is highly likely to bring the patient to medical attention. In contrast to the particles referred to above nanoparticles gain access to the smallest bronchioles, which lack cilia, and ultimately to the alveoli, however they don't stop there. As referred to in the extracts from published scientific articles cited below nanoparticles are capable of crossing the alveolar wall and so gaining entry to the bloodstream. Any search for similar articles in medical journas will readily locate an extensive range of similar articles.

As regards the extracts from those three articles cited blow several points should be noted. In the first place neither article is an isolated report of a single set of observations. All 3 are based on review of groups of reports which were already published and were reports of specific observations. Secondly much of this information was readily accessible 19 years ago and subsequent studies have confirmed the reality of pulmonary damage from inhalation of nanoparticles.

Bergamaschi E. *et al*. International Journal of Immunopathology and Pharmacology. 19 (4 Suppl), 3-10 , Oct-De.c 2006. Nanomaterials and lung toxicity: Interactions with airways cells and relevance for occupational health risk assessment. *" Although nanoparticles stimulate cytokine production and induce inflammatory reactions, they could behave also as conventional fibres"*

Baeza-Squiban A. Biol.Ajourdhui (2014) 208 (2) 151-8. Nanopartcles, Lung Injury, and the Role of Oxidant Stress. *"There is increasing evidence that nanoparticles exhibit an ability to cross biological barriers, getting access to the bloodstream and secondary target organs. Different features of nanomaterials (size, form, surface reactivity) contribute to their internalization and translocation through the respiratory barrier".*

Bergamaschi E. *et al*. International Journal of Immunopathology and Pharmacology. 19 (4 Suppl), 3-10 , Oct-Dec 2006. Nanomaterials and lung toxicity: Interactions with airways cells and relevance for occupational health risk assessment. *" Although nanoparticles stimulate cytokine production and induce inflammatory reactions, they could behave also as conventional fibers, showing the ability to cause lung granulomas and fibrotic reactions in experimental animals. "*

Madl A et al. Annual Review of Physiology (2014) 76, 447-465. Nanopartcles, Llung njury, and the role of oxidant stress. *'The emergence of engineered nanoscale materials has provided significant advancements in electronic, biomedical, and material science applications. Both engineered nanoparticles and nanoparticles derived from combustion or incidental processes exhibit a range of physical and chemical properties that induce inflammation and oxidative stress in biological systems'.*

FIRST DO NO HARM

This principle has a long history in medicine. In a medical context it is intended to identify a patient's health as the first priority in any measures which are to be undertaken by an individual's doctor. Would it be stretching this principle too far if one were to consider a similar responsibility as applicable to any government which is responsible for the health of a community likely to be exposed to an approved industrial activity?.

A tendency has sometimes emerged to conflate inability to prove confidently that a course of action is unsafe with proof that it can be taken to be safe. Such conflation is certainly not confined to medical practices. A concern which inevitably comes to mind when considering the safety of a novel technique for garbage disposal close to a rural town is the categorical assertion by the prospective operator that this technology is safe because it has not previously been possible to detect anything which is dangerous to human health in emissions during the disposal procedure. The response to that assertion insofar as it relates to the detection of nanoparticles should be to point out that reliable techniques to detect nanoparticles in emissions are yet to be available. Consequently to assume that one is doing no harm is invalid.

The extent to which nanoparticles could be released by the technology proposed during the procedure to be used in Tarago is quite unclear as this has been disingenuously described as 'heat treatment'. In its proposal which was released to the local community several years ago Veolia referred to a similar operation which had been commenced in the UK in 2017 which had not affected the environment. Few details of the nature of testing undertaken then have been provided.

WHY SHOULD THERE BE SERIOUS CONCERN ABOUT THE SITING OF THE PROPOSED FACILITY AT TARAGO?

The proposed facility will be collocated with the existing operation which undertakes the decomposition of large quantities of urban garbage. The prevailing wind frequently carries a very strong odour into the village itself (this has been the focus of much of the ongoing opposition from the residents). Unpleasant, yes, but there is much more to that. The practice at the Tarago primary school is to close the windows whenever the wind is blowing from the existing facility. Without knowing the nature of anything emitted during the course of 'heat treatment' at the proposed facility one can accurately predict that it will accompany the odour into the village.

Returning to the brief account of the pulmonary consequences of nanoparticle inhalation the insanity of having a primary school in the direct path of emissions the content of which is at present unquantifiable should be obvious. Anyone with the most superficial familiarity with

the course of any pneumoconiosis such as asbestosis or silicosis will know that the damage done to lung tissues doesn't appear overnight. This will often require decades. To categorise the release of fumes from a facility a comprehensive analysis of nanopaticle emissions from which is currently impossible can only be politely described as idiocy.

THE HISTORY OF THE PLANNING OF THE VEOLIA 'HEAT TREATMENT' FACILITY AT TARAGO

An extensive description of the Veolia project was publicly released by the company several years ago accompanied by an invitation for local community responses. All well and good. Whilst the size of the Tarago community response has yet to be released it is likely to have been unfavourable and in the hundreds. To the best of my knowledge receipt of submissions has never been acknowledged.

WHAT ABOUT TARAGO?

The extensive account of Veolia's plans made reference to government support for the location of three NSW facilities of the type proposed by the company during the period until 2040 with Tarago being the first of these. To the best of my knowledge there have not been statements forthcoming on the subject by any NSW government, perhaps not an appropriate example of due process. Meantime Veolia has undertaken regular releases outlining its financial contributions to regional activities and stressing its environmental responsibility.

Given the potential impact of Violia's 'heat treatment' technology on Tarago it's reasonable to consider the track record of the company. To conclude this short summary of the situation it may be appropriate to note a 2024 letter to the Canberra Times. "A Canberra Times advertising feature (page 57 August 23) quotes Veolia Woodlawn Eco Project Manager asserting 'We must contain and manage any contaminants to the highest level'. A front page article 4 weeks previously reported that Veolia had been fined twice for failure to dispose correctly of waste water. What should readers believe?"

In the interest of full disclosure I acknowledge my authorship of that letter.

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