

THE HEALTH HAZARD
AT WITTENOOM

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"No government, when it knows of a health hazard, can ~~help~~ it's employees working in that situation".

Mr Ray Young
Minister for Health
1.12.78

The medical evidence supporting the Minister's statement quoted above is contained in scientific literature and the results of investigations conducted by the Public Health Department.

In 1959 when it was first observed that mesothelioma was affecting certain people who had lived in the asbestos areas in the Northern part of the Cape Province of South Africa (1), (2), the occupational health physician in the Western Australian Department of Public Health was investigating the occurrence of silicosis and asbestosis in miners employed by Australian Blue Asbestos at Wittenoom.

X Annual Report 1955 ①

In a memorandum from the Occupational Health Physician to Mr O.A. Allen, Australian Blue Asbestos Pty Ltd, dated 5th October 1961 it was stated:

"This Department is becoming increasingly concerned at the number of employees and ex-employees of Wittenoom who are ~~presenting~~ ^{presenting} as patients suffering from asbestosis or silicosis - Dr McNulty informs me that he considers a number of dust counts at Wittenoom to be too high."

A meeting between representatives of the Health Department, the Mines Department and Australian Blue Asbestos was held in Perth on 10th October, 1961 and it was agreed that attempts would be made to improve the ventilation in the mine, and the mill and to institute a system of dust counting. However, it was recognised that existing methods of dust counting had definite limitations.

The first case of mesothelioma occurring outside South Africa was detected in a Wittenoom ex-miner by Dr J McNulty and reported in the Medical Journal of Australia in 1962 (3).

In the following year another report from South Africa postulated an unusual risk from exposure to blue asbestos and a rising incidence of mesothelioma from exposure to it during ensuing decades (4).

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Commissioner of Public Health

In 1965 Dr McNulty reported TO THE TIVEN CPH.

"The asbestos miners in this State have been exposed to such heavy dust concentrations at work it has always seemed a reasonable precaution to advise against the use of tailings for surfacing on the grounds that the workers should not be exposed to dust during their leisure hours as well.

Wagner has shown that out of 120 known cases of malignant pleural mesothelioma in the Cape asbestos fields, more than half had never worked in the industry but had merely lived in the vicinity of a mine or mill; included were females where only contact was with the overalls of miners, a radiographer who visited the mines only to take periodical chest x-rays, and an accountant who audited the books at an asbestos mine.

Newhouse has shown similar situations in Barking around the London Cape Asbestos factory and McCaughey in Belfast. Grazing animals around the mines in South Africa have developed asbestosis. Kiviluto in Finland has found pleural calcified plaques of a type peculiar to asbestos workers to be common in farmers and house-wives living near anthophyllite mines. Sluis-Cremer has reported similarly from South Africa."

Dr McNulty visited Wittenoom and made personal contact with the mine management and various townspeople to warn against the use of mine tailings in the town. This visit was recalled recently in a letter to the West-Australian, written by a former headmaster of the primary school at Wittenoom.

"A senior officer of the Public Health Department was passing the school and he saw the tailings. He came into the school in an obvious state of anxiety to warn me against spreading them. He said they were known to be a serious health hazard and quoted South African experience and medical research."

In October 1965 a letter from the ^{TIVEN} Commissioner of Public Health to the Shire Clerk, Tableland Shire Council contained the following statement:

"Over past years, our attitude has been made perfectly clear to the Mines Department and to the Management of the Mine on the use of tailings, by the Minister for Health, myself and my officers. The Management of the Mine has been given the opportunity to examine all the literature we have available on the subject. As your Council has always contained members associated with the Management of the mine, I cannot accept a suggestion that the Council as a whole is ignorant of the Health Department's attitude in this matter. — — —

My personal opinion on the asbestos tailing situation and the hazard to health associated therewith is that, as it exists in Wittenoom today, it forms a complete prohibition to the future development of Wittenoom as a residential area until all tailings are adequately covered with several inches of soil, or preferably removed or sealed in bitumen. I appreciate that this is a costly business and before taking more concrete action in this respect I have asked Dr McNulty to place the situation before several world authorities on this matter, to obtain the benefit of their opinions. When we receive these opinions I will communicate them to you; in the meantime asbestos tailings must be left where they belong - in the mine."

At that time, in 1965, there was no recognised health standard for asbestos dust. Dr McNulty sought the advice of experts overseas concerning the use of asbestos mine tailings for road surfacing. In reply the following opinions were received:

"I believe that the use of asbestos tailings on the surface of roads and on the surface of playgrounds, amounts to a deliberate sealing of the ground with a cancer producing substance, and therefore is contrary to every principle of prosecution of disease in man and contrary to all purposes of public health. One should avoid the mistake of not recognising the inevitability of serious disease, just because an immediate effect is not apparent."

Thomas F Mancuso, M.D.
Research Professor
University of Pittsburgh
January 19th, 1966

"In view of the South African experience and mounting epidemiologic evidence from other sources, it seems to me that you are fully justified in doing whatever is necessary to prevent the use of blue asbestos in West Australia."

W. Clark Cooper M.D.
Research Professor and
Lecturer
Occupational Health
University of California
November 19, 1965

"Whether exposure, which might be associated with environmental contact consequent upon using asbestos paved roads or playgrounds would be injurious I do not, of course know. Wagner's observations are suggestive, but not conclusive. Nevertheless, it would appear to me to be hazardous to assume that such contact carries no risk. I believe it is considerations such as this which recently lead to the banning of asbestos as a playroom material in California and

schools and a similar recommendation by the U.S. Commissioner of Education."

Irving J. Selikoff M.D.
Head
Section on Environmental
Health
The Mount Sinai Hospital
November 1, 1965

"Certainly the use of such tailings results in some measure of aerial pollution with fibre and this is a potential danger."

G.K. Sluis-Cremer
Director
Miners Medical Bureau
Johannesburg
29 October, 1965

"I think the simple answer to your letter is, stop it at once!
I think there are now ample grounds from South African experience and from your own in taking all possible care to avoid inhaling crocidolite dust, and that the use of it for surfacing roads and playgrounds is really quite unacceptable in the light of present evidence (which) -

fully confirms that there is a striking difference between the mesothelioma risk in the crocidolite area as compared with the amosite and chrysotile areas. No tumours have yet been observed from either of these two latter regions. The total number of tumours in South Africa has now risen to something like 170."

J.C. Gilson F.R.C.P.
Director
Pneumoconiosis Research
Unit
PENARTH
27 October, 1965

"As things stand it seems to me that the authorities cannot contemplate the contained existence of this potential hazard, and that the use of this potential hazard, and that the use of tailings for road surfacing must be prohibited, and that existing roads and playgrounds surfaced with tailings should be sealed."

W.T.E. McCaughey
Professor of Pathology
School of Pathology
Trinity College
DUBLIN
25 October, 1965

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In 1966, for the first time reasonably reliable dust counts in the mine and mill were obtained. An expert industrial hygienist reported:

"Typically a hand bagger was exposed to a respirable dust concentration of 3000 particles per cc of which 100 were fibres longer than

industry is said to work to an informal maximum of 4 fibres per cc but this material is white asbestos - whereas the material investigated was blue asbestos - crocidolite - which is quite different." (5)

Shortly after this investigation was completed, in December 1966, the mine ceased operations.

In October 1966, Dr McNulty received a letter from the Shire Clerk, Tableland Shire Council stating that an undertaking had been given by Australian Blue Asbestos not to sell or supply tailings except for use in bitumen or cement work and that the Council had ceased using it.

In January 1967 Dr McNulty wrote to the Education Department stating:

"The general public, especially children must not be exposed to the risk of inhaling blue asbestos fibre," and quoting the fact that the use of blue asbestos mine tailings for road surfacing and dumping close to schools have been shown to be a serious health hazard in the Cape Province of South Africa. He also said no loose fibre which could become air borne should be permitted in populated areas."

In January 1967, it was suggested that the asbestos mine at Wittenoom may be re-opened. This action was opposed by Dr D.D. Latham, Physician in Charge, Occupational Health, Dr J. McNulty, Physician Occupational Health and Dr P.F. Maguire, Mines Medical Officer. ^{P. Latham} His comments on the health hazard were reported in the West Australian of December 8, 1966.

In May 1968 the Health Inspector, Mr Kennedy wrote to say that the town people were adamant that fresh supplies of tailings were not being used. His observations indicated the need to question this statement.

A subsequent letter was received from Mr Graham, Area Manager, Hancock and Wright stating he was not aware there were any restrictions on the use of tailings. On receipt of information to that effect from the Health Inspector, he had a notice erected stating "Removal of Tailings under any circumstances strictly prohibited."

In correspondence between Dr McNulty and the Shire Clerk it was agreed that mine tailings could be incorporated in concrete if they were transported safely and if unused tailings were returned to the dump or spread or buried in such a manner that loose fibre would not blow about.

In 1968, the British Occupational Hygiene Society set up a committee to examine the available evidence and to reach an agreed solution for exposure limits to asbestos (6). They calculated that exposure to 2 fibres per cm³ for 50 years or 4 fibres per cm³ for 25 years or 10 fibres per cm³ for 10 years would give a 1% risk of asbestosis.

In 1969, Regulations incorporating these standards and governing all work liable to create asbestos dust were introduced in Great Britain. The standard for 'blue' asbestos, generally considered the most hazardous in relation to mesothelioma, was ten times more stringent (0.2 fibres per cc). Since 1970 British manufacturers have voluntarily agreed not to import blue fibre.

During the next five years the B.O.H.S. standard for chrysotile asbestos was criticised on a number of grounds. It had been established on very little data, it was based on the possibility of occurrence of asbestosis, which is of ^{LESS} ~~minor~~ importance relative to cancer and it used fibre concentration x years as a measure of exposure. The Public Health Department became increasingly concerned about a possible public health risk in Wittenoom.

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Mr W Moyle completed an inspection of Wittenoom on 25, 26th and 27th October 1973. His report contains the following observations:

"Streets are sealed but in all except one or two cases have been made with mine tailings. Evidence of unsealed tailings may be noted on the sides of the roads. In the early days it is obvious that people used tailings to make drive-ins for their houses and some even used them to cover garden areas. Large areas covered by tailings include the front of the Wittenoom Club, the car park for the Club, the Convent playground, the vehicle parking site near the State School and the tennis courts. The race course is completely covered with tailings and it is interesting how the fibres have become pulverised and separated with rain to form concentrations in the hollows made by hoof marks. At the airport tailings have been used, but a sealing programme is intended for the middle of November this year. The Shire Councillor, Mr McGuire, said that the Shire has not used tailings for years because they are aware of the health danger and also because it is now too expensive.

I contacted Mr Bolitho, Manager for Hancock and Wright, at Wittenoom. His office is in the Gorge where approximately 16 families are housed. Mr Bolitho said these families are employed by Hancock and Wright and are engaged in exploration and maintenance work. He said screenings are now sold at \$15 per ton to discourage anyone from using it. He is prepared to sell it to anyone making concrete. He said tourists

TECHNIQUES TO EXAMINE THE

WERE INADEQUATE.

^ Samples of airborne dust collected from Wittenoom at that time were ^
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 misplaced and not examined until 1975. The results were reported as follows:

	Personal samples (fibres/cc)	Fixt-flo samples (fibres/cc)
State School	0.16	0.03
Police Station	0.05	0.005
Airport	0.05	0.03
Woodward 5th Ave	0.88	0.006
53 4th Ave	0.05	0.004
Back of Hotel	0.11	0.006

It was stated that:

"No explanation can be offered for the large difference in fibre counts between the personal and Fixt-Flo samples. In both groups of samples the number of fibres appeared to be related closely to the total dust concentration as indicated by discolouration of the paper and represented only a very small proportion of the deposit."

The method of sampling was considered to be unsatisfactory, and it was decided to repeat the investigation when a more accurate method became available.

In July 1976 a Draft Code of Practice for "The Estimation of Airborne Asbestos in the Working Environment became available and discussions were started with the industrial hygienist in the School of Public Health and Tropical Medicine in Sydney concerning the use of an approved sampling method for asbestos dust for Wittenoom.

In July 1977, Dr Cumpston and Mr D Sykes visited Wittenoom.

1. Ten samples of airborne dust were taken while driving around the town at 40 km/hr with the sampling head protruding from the boot of the car.

The fibre counts (fibres/cc) were:

1.3	3.6
0.8	1.2
0.8	1.3
3.0	1.7
1.9	2.1

Average 1.77 fibres/cc.

2. Fixt-flo samples from B.P. Garage.
 1. No asbestos fibres identified in the sample.
 2. Two particles of crocidolite were identified in the sample, one of which conformed to the NHMRC criteria for fibre identification, the other being a non-respirable fibre bundle.
3. Dust in old houses opposite Shire workshop.
No asbestos identified in the sample.
4. Sand from creek bed approximately 5 km from Wittenoom.
The sample contains approximately 0.25 percent of crocidolite in millimetre sized particles which shed fibres of respirable dimensions if agitated.
5. Dust from outside vacuum cleaner bag. Dumar Motel.
Respirable fibres are produced in the sample, their concentration, relative to the total mass of the sample, being in the same order as in these samples which were collected by the personal sampler. Most of the fibres are between 5 mm and 50 mm in length and less than 1 mm in diameter. The coarser fibres include a high proportion of crocidolite.
6. Asbestos tailings collected from the mine site.
The sample contains approximately 5 percent of crocidolite, mostly in discrete matted aggregates of crushed fibre. This material is susceptible to shedding particles of respirable size.
7. Three samples of dust from a C.E.R.L. dust gauge mounted in the school grounds.

	Crocidolite	Respirable Fibres
1	present	not detected
2	present	present
3	present	present

In each case the crocidolite is estimated to be less than 1% of the sample. More than seventy-five percent of the crocidolite is greater than respirable size.

8. Seven samples of vacuum cleaner dust from various residences around the town of Wittenoom.

	Crocidolite	Respirable Fibres
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...cont.	Crocidolite	Respirable Fibres
Primary School	present	present
68 6th Ave	present	present
Cnr Beasley St and 7th Ave	present	present
66 5th Ave	present	not detected

In all the samples crocidolite is estimated to be less than one percent of the sample. The material from the Primary School has the greatest amount. At least 75 percent of the fibre is of ~~near~~^{near} respirable size. In the case of the Primary School this figure exceeds 90 percent, the school has the coarsest crocidolite fragments.

In 1977 x-rays were taken of 146 adult members of the population in Wittenoom and no definite evidence of asbestos related disease was detected in any x-ray.

At that time Dr Cumpston reported:

"There is no doubt that the population in this town would be exposed to the inhalation of asbestos fibres. The problem to be resolved is whether such exposure could produce asbestos related disease. If we take the allowable community exposure to be 1/10 of the British Occupational figure for blue asbestos (0.2 fibres per cm^3) it is unlikely that the resultant figure of 0.02 fibres per cm^3 would represent the continuing exposure of any individual in the community. However, one cannot altogether discount the possibility that mesothelioma may arise in an individual exposed to asbestos in Wittenoom. Therefore it is recommended that:

- a. no future development or growth of the town should be permitted;
- b. investigations described in this report should be repeated each year."

In November, 1977, a sample of dust from a personal sampler worn by a Mines Inspector for half an hour outside the school and one hour outside the hotel was found to contain approximately 0.2 fibres per cc of filtered air.

This figure equals the threshold limit set for crocidolite by the British Occupational Hygiene Society for occupational exposure. It was decided that the Division should embark on a more extended sampling program."

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Soon after this report was written information from overseas, an editorial in the 'Herald' made the following statement:

Exposure to Asbestos, a report of a working-group prepared for the Commission of European Communities, and the I.A.R.C. monograph no. 14 on asbestos. The first concludes from information on environmental contamination that no convincing evidence exists in Western Europe of increased risk through true ambient exposure to asbestos - in air, water, drugs, beverages or food - though the possibility of such a risk cannot be categorically denied. Para-occupational exposures of family and neighbourhood and leisure-time working with asbestos-containing products are singled out as an area of concern. The I.A.R.C. report, looking at experimental as well as epidemiological evidence, concludes more pessimistically that "it is not possible to assess whether there is a level of exposure in humans below which an increased risk of cancer would not occur."

The editorial ended by saying:

"An advisory committee of the Health and Safety Commission is examining not only health aspects of asbestos but also economic factors in the control of hazards and substitution by alternative materials such as man-made mineral fibres. A report is expected in 1978, and revised codes of practice and standards will doubtless follow." (7)

Later in 1978, it was reported in the Royal Society of Health Journal, February 1978, that:

"The Asbestos Information Committee accept that the asbestos concentration presenting a negligible hazard for a life-time's non occupational exposure is 0.04 fibres/cm^3 , whereas Kelly has suggested that the concentration should not exceed the normal background level." (9)

In May 1978, an article in the Lancet reported the death of 65 females from mesothelioma. ^{TEN} of these had routinely laundered their husbands or fathers clothing, but had no industrial contact with asbestos. (8)

In July 1978, Dr Cumpston visited Wittenoom and explained to residents that there is a slight health risk to adults following prolonged residence in the town, but the hazard is greater for children. He arranged for a volunteer group of citizen's to wear personal dust samplers. A trial period of sampling was found to be technically satisfactory and the following results were obtained:

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	Fibres per cm^3
1	0.08
2	0.09
3	0.01
4	0.21

cont...	Fibres per cm ³	
	9	0.01
	10	0.06
	11	0.12
	12	0.02

Average 0.075.

It was therefore decided that the presumed health risk to residents at Wittenoom, particularly to children was confirmed to a sufficient degree to convey this medical information to the Minister for Health.
