

**STANDING COMMITTEE ON
ENVIRONMENT AND PUBLIC AFFAIRS**

**TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
ON MONDAY, 18 FEBRUARY 2002**

SESSION 1

Members

**Hon Christine Sharp (Chairman)
Hon Kate Doust (Deputy Chairman)
Hon J.A. Scott
Hon Louise Pratt
Hon Frank Hough
Hon Robyn McSweeney
Hon Bruce Donaldson**

Committee met at 10.00 am

HALL, MR ANTHONY,
Chairperson,
Yarloop and Districts Concerned Residents Committee,
examined:

The CHAIRMAN: Welcome to this hearing. You have signed a document entitled "Information for Witnesses". Have you read and did you understand that document?

Mr Hall: Yes.

The CHAIRMAN: These proceedings are being recorded by Hansard and a transcript of your evidence will be provided to you. To assist the committee and Hansard, please quote the full title of any document to which you refer during the course of this hearing. I remind you that your transcript will become a matter of public record. If for some reason you wish to make a confidential statement during today's proceedings, you should request that the evidence be taken in closed session. If the committee grants that request, any public and media in attendance will then be excluded from the hearing.

Until such time as the transcript of your public evidence is finalised, it will not be made public. Any premature publication or disclosure of public evidence may constitute a contempt of Parliament and may mean that the material published or disclosed is not then subject to parliamentary privilege.

You have provided a lengthy submission to the committee. I understand that you wish section 20 to be treated as confidential.

Mr Hall: Just the names and addresses in that section.

The CHAIRMAN: The committee is prepared to withhold those names. You do not wish the other information in that section to be kept confidential. Do you wish to make an opening statement to the committee?

Mr Hall: We, the members of the communities affected by Alcoa's Wagerup refinery, require Alcoa to lower production to a level that no longer impacts on the health and welfare of our communities until completely independent testing and monitoring is established on a continual basis and all substances being emitted have been identified and quantified. The need for this is made evident by the lack of adequate monitoring and sampling in the conditions of the Department of Environmental Protection granted licence, which directly contradicts all government departmental guidelines and does not take seriously the impact on our communities regarding health, amenity, social aspects, property values and loss of lifestyle. Alcoa has had more than four years to fix these problems to gain approval for its next expansion and this is the outcome. Given that, we believe Alcoa has failed in its attempts to do the barest minimum to meet the requirements necessary to secure its 3.3 million tonnes per annum upgrade.

Our submission focuses on all aspects of Alcoa's operations at Wagerup, from the original environmental review prior to construction to present day. This is backed up by Alcoa documentation we have been able to obtain and current research from around the world applicable to problems caused by Alcoa's operations here at

Wagerup in Western Australia, its national operations and with regard to Alcoa and the alumina industry worldwide. This is not an isolated incident, as Alcoa would have us believe. By the end of our submission, this will be evident. We have supplied extracts from documents only.

Prior to construction of the Wagerup refinery, an environmental review was undertaken and the results published in 1978 on detailed sampling and monitoring to set a base level prior to the impact of refinery operations. The meteorological data set indicated major impacts due to the location of the refinery on the scarp, topographical effects, climatic conditions - that is, low-level inversions and standing eddies causing vortexes - which all impact on emissions and result in concentrations of emissions reaching fumigation levels.

Alcoa has stated that further studies are warranted to determine the full implications. An independent audit commissioned by Alcoa 20 years later - in 1988 - and undertaken by Kinhill and Associates, recommended that Alcoa choose an appropriate air dispersion model to take into account complexities of topography and climatology in the area to better understand the total impact of emissions on local air quality. Alcoa commissioned another study conducted by Dr Barry Carbon. He explains in his description of plume behaviour that dispersion is not being achieved as Alcoa states, but is actually funnelling from the refinery and through the surrounds and concentrating into a plume approximately 100 metres wide under conducive atmospheric conditions. Even though Alcoa understands the implications of the local conditions upon its emissions and it has been recommended on these occasions that its air dispersion modelling is inadequate, to our knowledge, nothing has been done to address this deficiency.

As it stands, the 1978 review states that the refinery has been located with due consideration to prevailing winds and community centres, and ongoing research with the PHD into meteorological conditions was underway. This environmental review was conducted on the basis of a 200 000 tpa output, but construction was delayed due to a depressed world alumina market. When construction was completed, the output had increased to 750 000 tpa and the original refinery layout had changed, and we can find no evidence of an environmental impact study being done to account for these changes. Could this be because local meteorological conditions would cause intensification and fumigation levels of pollutants, and the throughput was increased on the merits of the original review undertaken two years previously in the hope that the impacts stated in the 1978 review would be forgotten?

The odour emission study by Environmental Consultancy Services provides results of some of Alcoa's stack samples and the compounds sampled. For example, we chose the VOC methanol and added the amount from sources listed and the average from sources not listed - these being the rest of the precipitation tanks, of which there are 48 in total - and allowed for one bank offline for maintenance - a bank is six tanks. This leaves 42 tanks and all four calciner stacks at an average of 0.7 milligrams per cubic metre of methanol emitted, which is less than the amount of the actual result to allow for averaging. The total amount of this compound emitted by these sources into the air above the refinery is 37.977 mg/m³. Alcoa and its auditors have identified 300 VOCs, with the Kinhill audit estimating 500 mg/m³ total VOCs emitted - this could be a conservative estimate. Added to the fact that unless VOCs are cooled to less than 350 degrees Celsius in less than two seconds of burning they can reconstitute to 100 per cent after exiting the stacks in the correct meteorological conditions conducive to

intensification and fumigation levels, it is not hard to see how the refinery is severely impacting on the health of the workers and the communities.

Alcoa has told the residents of the affected communities that synergistic effects of chemicals in the atmosphere are far too complex to calculate, so it is not possible to predict what transformations could be happening. We have researched international literature on this subject and have concluded that both Alcoa and DEP are fully aware of both primary and secondary reactions in the atmosphere. This information is readily available, but for some reason they do not wish to admit it.

In Texas, where Alcoa operates a number of facilities, and where it is subject to a far more stringent monitoring regime than that in place here, the Texas Natural Resources Conservation Council - the regulatory body - requires that emissions inventory questionnaires contain information on process equipment descriptions, operation schedules, emission control devices currently in use, abatement control device efficiency, stack parameters such as location, height and exhaust gas flow rates and VOC speciation of emissions to predict the formation of ozone attributable to industry sources due to NOX and VOC emissions.

Dr G. Peach from the University College, London, discusses the formation of ozone due to NOX and VOCs with greatest concentrations formed during hot, calm conditions and states that ozone levels are lower near the source and can be trapped in the lower atmosphere in the right conditions for many days. Our own national pollution inventory web site lists the hazards of NOX as reacting with ozone and ultraviolet light in different ways depending on the ratio of NOX to oxide back into nitrogen dioxide. Barry Carbon's report also explains the role of NOX, VOCs and UV in the formation of secondary chemicals, the most common being ozone, peroxy acetyl nitrate, hydrogen peroxide, acroliene and formic acid.

Adequate air dispersion models are readily available which not only calculate complex terrain and meteorological and climatic conditions but also provide software to calculate atmospheric chemistry and biogenic sources of emissions to give an accurate picture of the effects of all sources of emissions on a local scale or a statewide scale if necessary. Examples of software readily available are the Commonwealth Scientific and Industrial Research Organisation's LADM and TAPM. These are compatible with regulatory air dispersion models - Ausplume and so on. The benefits of these were promoted at a seminar in Perth in 1999. Another package is CAMX, which is made freely available in the United States, and, as Alcoa operates there, it should know of its existence. The fact that a number of companies are advertising their services to assist in this area further leads us to believe that Alcoa does not want to recognise the problem and its impact on its workforce and surrounding communities.

[10.15 am]

We need to also consider that individual chemicals and compounds are being emitted from the refinery at levels exceeding all relevant standards, although their identity and quantity have not been identified at this stage. The vehicle damage claims submitted to Alcoa by their work force have included a large number for damage to windscreens and external mirrors. This pitting of windscreens has also occurred in Yarloop. Our research indicates that hydrogen fluoride may be responsible, as it is known to be highly corrosive to most substances, including glass. At low levels fluorides can irritate the eyes, skin and lungs. Contact with hydrofluoric acid can burn the eyes and skin, and long-term exposure may damage kidneys and the liver. All symptoms have

been reported by Wagerup's work force and surrounding residents. Hydrogen fluoride will exist as a particle if released into the air and may dissolve in clouds, rain or other sources of moisture and be deposited as a wet acid deposition. We have included photographs of galvanised rainwater tanks in Yarloop that are less than eight years old that have been eaten away. This damage to galvanised iron is found around the world on properties near alumina refineries. Residents of Clarendon, Jamaica, have successfully sued Alcoa for damages.

It is entirely possible that after a recent expansion, which included the commissioning of the liquor burner, the Wagerup air shed's chemical composition was changed due to the increase in emissions and an entirely new source from the liquor burner. Fluorides and hydrogen are present in the process and would be released in a number of areas. Fluorides are extremely volatile and would be released in high temperature areas of the process such as digestion, calcination and the liquor burner. Alcoa states in numerous documents that steam is a major part of its emissions and, obviously, hydrogen is a major component of steam. Alcoa personnel have told us that samples of green liquor at Wagerup indicated that fluoride was present at levels of two to five milligrams per litre; however, Alcoa rejected these results.

We are extremely sceptical of Alcoa's uncorroborated reports of the quantity of its emissions, because if one looks at the Wagerup emission reports to the NPI - the National Pollutant Inventory - some interesting trends appear. The 1999-2000 NPI report stated 390 kilograms of fluoride were released to air and in the 2000-01 report this figure was 500 kilograms, an increase of 29 per cent. Over the same period, lead emissions have gone from a reported 60 kilograms to 89 kilograms, an increase on the earlier figure of nearly 50 per cent. At the same time, reported emission of sulphur dioxide has plummeted from 35 000 kilograms to 1 400 kilograms, and oxides of nitrogen have dropped from 2 300 000 kilograms to 1 800 000 kilograms. Residents living in the local area would have trouble accepting that any emission levels have actually dropped, as they face growing impacts from the refinery. As far as we know, no pollution control devices have been fitted to account for this dramatic drop in emissions.

Other substances not reported, that are possibly being emitted from the Wagerup refinery, are phosgene gas, hydrogen chlorine gas, maleic anhydride and carbonyl sulphide, to name a few, and all the ingredients are in that refinery to produce these. Heavy metals are not monitored for, yet during sampling for the health survey lead samples were recorded at 750 parts per million. No investigation as to why, and still no requirement to monitor for lead, even though it was noted that Borserio's had recently cleaned their gutters prior to the health survey investigations.

In late September we sent dust samples from a roof cavity in a building in town for analysis at a reputable laboratory. Two and a half years previously that roof cavity had been cleaned out and a tarp placed over the ceiling to stop ingress of dust into the building. This is after the sale of leaded fuel had ceased, so lead levels would unlikely be attributable to exhaust emissions from vehicles in Yarloop, even if Yarloop had heavy traffic flows. No painting had been done inside the cavity, so lead-based paint is an unlikely contributing source, yet high lead level concentrations were found at 880 ppm and aluminium at 28 000 ppm. This indicates that the refinery is the only likely source of the contamination. Adequate testing and monitoring at an early stage would have either proved or disproved this, but as it has never been done we will never know how much heavy metal exposure we have had and to date are still getting.

Aluminium oxide itself is classified as a hazardous substance in most countries as it is a respiratory irritant and a suspected neurotoxin and was to be listed on Australia's NPI as a suspected carcinogen until industry pressure had it removed along with hydrogen fluoride. Aluminium oxides are also, at times, used to enhance chemical effects in studies carried out on laboratory animals, and it also has a propensity to bond with other chemicals. It is concerning that levels as high as 76 000 ppm have been recorded outside the refinery boundaries. Those levels themselves constitute pollution even if it were an inert substance. Another emission that has a propensity to bond with other chemicals is particulate matter 2.5, which is easily inhaled into the deepest parts of the lungs, carrying with it any bonded chemical and it is increasingly being researched as a major contributor to asthma and other respiratory problems. Alcoa is not required to monitor for any of the above. How convenient this is, when it is claiming to be seriously investigating chemicals responsible for adverse health effects for over four years, but is not targeting substances known to cause the symptoms reported by its work force and local residents.

After investigating and researching all of the above, we doubt the quality of testing and the validity of the health survey report as a scientific study into possible causes of health effects. The reason for this is the number of anomalies in the test results, guesses as to the reason for these anomalies, and no follow through to find out why.

Examples of this that stand out most prominently are the gutter sludge sample from Borserio's - recording high lead levels of 750 ppm - and the comment that Borserio's had recently cleaned its gutters. Yet that is of no concern to Alcoa or any of the bodies involved in this side of the investigation. The lack of fine particulate matter in high volume sampling that should have been present is another concern. The method of sampling at Borserio's and Sczraba's, which had the residents manually activating sampling equipment during times of noticeable emissions, not surprisingly, showed no levels of concern, as the exposure could have been hours earlier. As odour was the trigger for manual activation of the sampling device, this may not necessarily have coincided with exposure to the chemicals responsible for health effects as stated by Barry Carbon in his report. This system of sampling is further compromised by the fact that inversions are lower and more intense during the night and subjects would be unaware of any "event" whilst asleep, although they would still be exposed, and the fact that most chemicals that could affect health in the reported manner can take hours before symptoms develop.

It should also be noted that for the vast majority of the health survey report - the sampling section of it, anyway - the liquor burner was off line. This would have substantially reduced levels of the emissions targeted - and possibly responsible for health effects - and would supply the results that verify Alcoa's claims rather than an accurate indication of actual levels of emissions experienced for most of the year.

[10.30 am]

In reality, it comes as no surprise that the scientific evidence gathered so far proves that all chemicals are below all relevant safety standards and that these symptoms are either a psychosomatic response to bad odour - everyone knows that a bad odour will make a person nauseous - or occur only when people have a naturally low tolerance to chemicals. Workers with this problem are classified as unsuitable to Alcoa's environment, as stated by Alcoa. In Alcoa's slide presentation "Introduction to the Liquor Burner", Alcoa states that although odour is not a health hazard, it can cause headaches and nausea. A concerning factor here is that in the 1978 environmental

review, Alcoa states that there are unidentified aromatic hydrocarbons responsible for refinery odours and that investigations were ongoing to identify these. Yet after more than 20 years, all these hydrocarbons have not been identified. If the chemicals responsible for these health effects cannot be identified, how can a correct diagnosis be given and effective treatment be administered when no-one knows what is wrong? Members of both the community and Alcoa's work force have been diagnosed with various types of serious ailments, from chromosomal damage to multiple chemical sensitivity to organ failure.

Australian and international studies are now intensely focusing on multiple chemical sensitivity, and the fact that this condition is brought on by long-term, low-level exposure to chemicals and the more the exposure is prolonged, the more irreversible it becomes. That is a view shared by the medical forum convened by the Public Health Department to look into the health complaints associated with Wagerup and by many other researchers worldwide. In Associate Professor Chris Winder's report titled "Health Conditions Associated with Low Levels of Exposure to Chemicals", he gives an insight into the cause and effect of this type of exposure, as do other papers supplied in this submission from international researchers.

Who can guarantee our children will not suffer long-term health effects? Research indicates that children are most at risk because they are still developing physically and exposure to chemicals can carry lifelong consequences.

If we look at the survey of symptoms reported by the workers and community alike, we see that the reported health effects are too similar to be dismissed as psychosomatic or trivial. Alcoa cannot continue to deny being responsible for health effects for much longer because people are now aware that the symptoms they put down to viruses, flu, hay fever etc regularly coincide with climatic changes that bring the refinery odour. We asked people affected to supply us with a letter stating health impacts in their own words, although the impact statements provided to the inquiry also give comments regarding all aspects of the impacts caused by Alcoa. We ask the committee not to publish the names and addresses of these people as they were supplied to authenticate the statements, and these people would not like their names published for various reasons.

Due to the sheer number of chemicals that Alcoa emits that are respiratory irritants, many with far more severe health effects associated with low-level exposure than just respiratory irritation, and depending on the time of the year and climatic conditions, it is entirely possible that we are being exposed to two different types of chemical cocktails on a rotating basis. During the winter months, when intense low-level inversions form - studies prove that these conditions lead to an increase in ground level concentrations of pollutants, and Alcoa's study states that due to the unique environment at Wagerup, this can lead to fumigation levels of chemicals present - we would be exposed to the primary chemicals emitted from the refinery. Alternately, during the warmer months, we are exposed to secondary chemicals transformed due to the increase in ultraviolet radiation and obviously warmer weather.

Alcoa's ambient air monitoring station site was chosen not by calculations from air dispersion modelling but because it was convenient, as it had a power supply. As only one monitoring station is used, and despite Barry Carbon's report stating that the plume may condense to as little as 100 metres wide, and the fact that no monitoring has been done regarding secondary chemical formation away from the refinery, it is highly unlikely that any chemical will be identified as the cause of the health effects

until the refinery increases its throughput to a level that makes detection unavoidable. That is an extremely disturbing thought for most of the residents in the area who are already suffering at current production levels.

It is no wonder that the alumina industry in general has problems on a worldwide scale, whether it is refining or smelting. If this is a phenomenon, it is a worldwide one, because, after searching the Internet, I discovered that Alcoa has problems almost everywhere it operates - not only in its refineries, but also in its smelters and downstream processing and manufacturing. Few communities worldwide that have the misfortune to be neighbours of the aluminium industry have escaped severe impacts of pollution on their health and environment. Communities in Jamaica, Ireland, the Virgin Islands, USA, Mexico and here have been forced to take action to protect their rights against one of the largest polluting industries in the world. In the USA, Alcoa is one of the major owners of industrial sites that are so heavily contaminated that the Government has declared that they must be cleaned up regardless of the cost, and it has set up a superfund to achieve this. Numerous other heavily contaminated USA sites, which do not quite reach the level to qualify for the superfund, show a history of Alcoa's profit-before-environment attitude. In 1998 Alcoa was fined \$US8.8 million for polluting a tributary of the Mississippi River. In the face of increasingly restrictive environmental laws in the USA, Alcoa's answer has been to move more and more operations to countries that have far fewer stringent laws to hamper its drive for larger profits, with no regard for the environment on or around its sites. This has resulted in ongoing investigations and prosecutions, record fines being imposed and mounting lawsuits. One must wonder how it can be the recipient of so many environmental awards.

Another aspect of concern is Alcoa's promotion of unprocessed red mud residue as a fertiliser for agricultural use. Recently Alcoa admitted in the media that the residue disposal area is leaching contaminants into the groundwater, and at a meeting on 6 September 2001, Ron Stone stated that mercury and fluorides from the process wound up in the mud lakes; that is, the residue disposal area. How can a mining waste product which contains heavy metals and fluorides and which is unprocessed be good for the land? Prior to trials of alkaloam in our area, both Alcoa and the Department of Agriculture claimed that alkaloam reduced phosphate leaching, but the farmers involved in that trial reported seeing aerial application of fertiliser to blue gum and pine plantations on areas near their properties. High levels of phosphorous in sampling done in waterways prior to the application of alkaloam in these trials probably reflect the fertilising at that time. Sampling done after the application of alkaloam showing reduced levels of phosphate is not necessarily attributable to the red mud, as no further sampling was done after that to prove that the levels had dropped due to red mud and not that no further aerial applications of fertiliser had taken place during these trials. Based on this evidence, pro-alkaloam advocates walked away claiming success. What was determined by the last water samples was that heavy metals and aluminium levels had risen dramatically. When the Department of Agriculture was queried about this, the Department of Agriculture asked for the results of that test to be returned as an error had been made and a new accurate set of results would be issued showing lower heavy metal contamination. In the USA there is growing concern also about the use of unprocessed industrial waste as fertiliser.

Due to recent media attention given to this issue, the Department of Agriculture stated that the high levels of heavy metals and aluminium recorded then was typical of surface waters in our area. If this is so, why did the Department of Agriculture ask for

the original results to be returned; yet it is now defending the original results? The Department of Agriculture's statement that high heavy metal and aluminium is typical also directly contradicts the then Public Works Department and Alcoa's detailed water quality analysis of drains in the area which could find no heavy metal or aluminium at detectable levels.

Pilot trials on a house constructed of bricks made of red mud failed due to high radioactivity. Alcoa's concern about the radioactivity of this waste is stated in its 2000 environmental review, in which it says that there is a need to continually monitor residue so as to prevent it becoming classified as radioactive waste under the Department of Mineral and Petroleum Resources regulations. Despite also stating in that report the need for ongoing testing, monitoring and sampling of alkaloam and its use, no-one has been back to the original trial sites in this area to see the results.

We are still investigating the claims that we have made about ground water contamination, so we would like to retract that part of our written submission.

The CHAIRMAN: Are you retracting something you have just said?

Mr Hall: No.

The CHAIRMAN: Can you clarify exactly what you are retracting?

Mr Hall: We are still investigating the claims, so we retract the part blaming Alcoa for the contamination of ground water and killing flora in Baldivis. Ongoing investigations have now cast doubts on that.

The CHAIRMAN: That part is retracted.

Mr Hall: Hon Giz Watson MLC asked for a report to be done on the transport of red mud in uncovered trucks, as the mud was spilling from the trucks during transportation in public areas. Analysis of red mud showed pH levels of nearly 10. How can a product this contaminated and dangerous be considered an agricultural aid? As Alcoa admits that all of its residue disposal areas are leaching contaminants into ground water, we wonder whether one of its personnel would drink a glass of water from one of these bores near the refinery today. The 1978 environmental review on ground water analysis found most ground water in this area to be potable. We doubt that it still is today, but this needs to be urgently addressed as not all properties in this area are on scheme water. Bore water is used for livestock and it also supplements rainwater supplies in the drier months. As ground water reserves would also be lower at this time of year, this would lead to an increase in concentration of contaminants. The areas researched by us which have already been mentioned include meteorological, climatological and topographical effects; fumigation levels of chemicals in conducive conditions; some unusual plume behaviour less than 100 metres wide, which was described by Barry Carbon as an out-of-control hose; the recommended use of an appropriate air dispersion model still has not been implemented; formation of secondary chemicals away from the refinery; the growing number of people adversely affected health wise; Alcoa's claims that it is not responsible for health effects; scientific studies cannot find anything; Alcoa would fix the problem if it could find it; pollution of aluminium oxide to the refinery surrounds; claims that aluminium oxide is an inert substance; ground and surface water contamination; and the promotion of heavily contaminated waste product as a fertiliser. These issues suggest that Alcoa is not being totally honest with us. This view is reflected by Alcoa's claims in the media and during the community consultation process that it had purchased only two properties to that point and would

purchase no more until the land management proposal was accepted by all; yet the minuted meeting of the Wagerup Refinery Subcommittee of May 2001 states that Alcoa had purchased three properties six months prior to that meeting and the purchase of a further two properties was almost complete.

Continual errors do little to promote public confidence in its honesty, including errors in reports like the semivolatile organic compound summary report No 0044, which is a sampling analysis of emissions, in which Alcoa claimed mass flow rates need to be divided by 1 000 to obtain actual results; mistakes in reporting to the National Pollutant Inventory; Alcoa's absentmindedness in forgetting to install a sample port to calciner stack No 4 during construction, which then ran for nine months without any testing or sampling; operating the liquor burner for two years without a licence and without pollution controls even though it was recommended by its research and development team due to problems experienced at Kwinana, which team recommended locating the liquor burner in the north east corner of the refinery away from the communities; and continual denial of health impacts even though the link has been established by the working group in the health survey report, the Public Health Department, the medical forum and Dr Barry Carbon. The media reported that Worsley admits its liquor burner affected its workers' health and the unit had pollution control equipment fitted; yet Alcoa denied its liquor burner had affected its workers, and that unit ran for two years without pollution equipment at all. In the light of all this mounting evidence, we should consider that Alcoa's perspective on environmental regulation requires a framework to operate without unacceptable impacts and that more regulation does not equal better performance. We wonder how it can come to that conclusion.

[10.45 am]

Recently QAL in Queensland was prosecuted for polluting the environment and the community with alum oxide, yet our environmental protection agencies have not only allowed Alcoa to pollute the surrounds with levels of alum oxide as high as 78 000 ppm and exceed noise limits on a regular basis but also failed to act on almost 2 000 complaints - there were 700 last year alone. Despite the fact that with each expansion of the refinery the number of complaints increased and more people experienced adverse health effects, Alcoa continued to receive approval.

During the 2000-01 licence year Alcoa was operating outside the licensing provisions for almost all of the year. With a record number of complaints and residents suffering health effects, and an appeal against the amendment to its licence to allow for the throughput exceedance, it received its amendment with only one month remaining on its existing licence. Further appeals based on health issues against Alcoa's new licence allowing additional throughput also failed. If the guidelines established by the EPA and the DEP were followed, this present situation would not have occurred, as all areas covered in this submission would have been dealt with and the impacts from Alcoa's plant would be far less.

It seems that countless hours of work and taxpayers' dollars poured into these guidelines have been wasted, as Alcoa is fully aware of their contents and had input into the formation of them. Alcoa is also a signatory to the Perth air quality management plan and is aware, as are the DEP and the EPA, of concerns regarding formation of secondary chemicals such as ozone, the concerns over health effects of chemicals such as PAHs, PM 2.5 and heavy metals, but none of these is required to be monitored as part of Alcoa's licensing conditions.

As these guidelines were established to protect industry, environment and communities alike, which concur with the basic rights afforded us in common law, these guidelines should be made statutory, and a responsible department given the powers to enforce them, otherwise these problems will be ongoing, as current problems with industry around the State prove.

Small businesses are not allowed to self-monitor but must pay to have their emissions estimated. The same should apply to big industry, as it has the most to gain by self-monitoring. A small miscalculation or error has the potential to have large consequences. As we believe the committee has seen, Alcoa has already made a number of these under the watchful eye of our environmental protection agencies. The sooner the independent testing and monitoring is implemented the sooner all communities will be comfortable sharing their environment with big industry. As the emissions and health effects are entirely due to Alcoa's processing, it is not unreasonable to expect the costs to be borne by Alcoa. Alcoa has had more than four years to identify the chemicals responsible and more than 20 years if we include the research into the unidentified aromatic hydrocarbons responsible for odour. Surely by now it is time to bring in the experts and allow them to investigate, unrestricted by parameters set by Alcoa.

As the current system operates, it is we, the members of the community, who must pay the price for Alcoa's expansions with the loss of our health, amenity and lifestyle and more than possibly the loss of our communities. Alcoa claims it is not responsible for health effects in this area, so there is no need for people to move away from the refinery. However, it has undertaken to purchase at unaffected market value all properties from people who no longer wish to live in the vicinity. This value is determined by the last sale in the area or, alternatively, the size of the landholding and house, less a percentage for each year of the building's age. That is hardly fair considering that many houses in this area have been classified as heritage by the Harvey Shire Council, and that prior to the announcement of the buffer zone expansion some people had sold at a reduced price to obtain a quick sale to protect their deteriorating health. No consideration has been given to the fact that due to reasonable prices of real estate in this area and because they had no intention of moving, many people have spent money on improvements that they may not have been able to afford if they had purchased a property elsewhere. Alcoa calls this overcapitalisation. Some of the older residents in our community have spent many years prior to retirement building a comfortable place in which to spend the rest of their days and are now being forced to consider moving at a time in their lives that they should be sitting back enjoying themselves. Alcoa calls this overcapitalisation.

The older members of our communities were born and bred here and it is these people on whom the current situation impacts most greatly, as they have never lived anywhere else and have no intention of moving. They are surrounded by lifelong friends and family members who live next door and across the road. They are now faced with the fact that if they must move they will no longer have this support. It is very unlikely that family and friends will be living that close in whichever place they move to. Almost all the members of our communities would prefer that Alcoa's processing return to the level of impact sustained prior to liquor burner associated problems when Alcoa ignored us and we ignored Alcoa.

The CHAIRMAN: Given that Alcoa has repeatedly claimed that the emission levels around the refinery are below acceptable guidelines, yet your evidence suggests that for various chemicals, heavy metals and so on they exceed relevant standards, what

exactly is the nature of the evidence you have via monitoring or otherwise of these very high elevated levels of chemicals?

Mr Hall: The 1978 review is where most of our research came from. Studies in that suggested that, due to the effects of the conditions, dispersion would not be achieved because it is trapped in the local area and would increase. The stated fumigation level is from that environmental review. The majority of evidence is based on that. The same with the Kinhill report. It was recommended in that audit that Alcoa needed to consider using an adequate air dispersion model to take into account the topographical effects and the complexities of that area because it was felt that would not adequately be achieved. The CAMX version was recommended.

The CHAIRMAN: What about the figure for the aluminium oxides? I think it was 78 000 parts per million.

Mr Hall: The 78 000 was from the health survey interim report. That was recorded at Borserio's property.

The CHAIRMAN: Who recorded that?

Mr Hall: The Chemistry Centre (WA) on behalf of the Department of Environmental Protection.

The CHAIRMAN: I understand that during the past 12 months two appeals have been made on the increase in throughput under licence conditions to Alcoa. Has the Yarloop group been involved in that process?

Mr Hall: Yes, we have appealed against it.

The CHAIRMAN: Do I understand from the submission you read this morning that the second appeal has been finalised and been rejected? When did it take place?

Mr Hall: The extra throughput is included under that licence. Yes, I would say that our appeal has been rejected.

The CHAIRMAN: I am aware of the appeal report that came out in, I think, October last year. Has a subsequent report been released from the convenor's office of the Department of Environmental Protection of which you are aware?

Mr Hall: No, we have had no report from that area, but we are going by the actual licence that allows for that additional throughput.

The CHAIRMAN: Is there anything else you want to add about that appeals process?

Mr Hall: Not only the appeals process but all areas are of major concern. Each expansion has caused a widening impact from the refinery. The next step is a jump to 3.3 million tonnes per annum. After that I think it is aiming for four million tonnes per annum. We cannot see how Alcoa will be able to control those emissions at that throughput without having more impact than it is having now. We do not consider that the buffer zone it is establishing now will adequately address problems. If it almost doubles in size again, we cannot see how Alcoa can control the impact of those emissions. We based our appeals on the fact that with each expansion will come more problems for the work force and residents, such as health impacts and noise. Although noise is not a primary concern, the health side is.

The CHAIRMAN: Around which year would you say that the significant public health complaints began?

Mr Hall: I am not exactly sure. I know that the Wagerup Community Health Awareness Group has been investigating this since 1996 or 1997. We have been aware of it only since Alcoa advised the community of the proposed buffer zone expansion. We became much more aware of it because Alcoa was making statements that no toxic emissions were coming from the refinery whatsoever. Many statements were made along those lines, which we did not believe, so we had to make sure that people knew that was not the case.

The CHAIRMAN: Are you aware of what the volume throughput was around that stage?

Mr Hall: Which stage?

The CHAIRMAN: Around 1996 when these complaints began?

Mr Hall: I am not 100 per cent sure; it is about 1.8 million.

The CHAIRMAN: We can check that.

Mr Hall: It was much lower than what it is now, there is no doubt about that.

The CHAIRMAN: It is below the 2.2 million tonnes per annum, which was expanded last year to 2.35 MTPA.

Mr Hall: Correct.

The CHAIRMAN: Will you please tell the committee a little bit about Alcoa's land management proposal and whether the residents of Yarloop that you represent consider it a satisfactory outcome for them?

Mr Hall: It is not satisfactory at all. The people there do not want to feel any impact from Alcoa's processing. They want it to confine emissions to its property and to be left alone, as it has been for 20 years until now. Alcoa had very limited input into Yarloop until this buffer zone, as a result of which, effectively, we could end up losing the entire community.

The CHAIRMAN: Has there been any survey of the residents involved in both areas A and B on whether a consensus indicates that this represents the community's desirable outcome?

Mr Hall: Do you mean the buffer zone?

The CHAIRMAN: Yes, Alcoa's proposal.

Mr Hall: On the original proposal, the letters were sent in and Alcoa found it was not acceptable. Alcoa revised that with, I would say, little or no input from the community and that was passed by Alcoa's board, although no formal survey was done. Nothing has changed. Revisions to that land management proposal are negligible. It does not address the concerns of the majority of people in town.

The CHAIRMAN: Is it correct that Yarloop faces losing its services such as primary schooling and the hospital and other public services?

Mr Hall: It is very likely that that will happen if the student numbers drop at the school. They have already dropped. Enrolled numbers have dropped 30 per cent this year and Alcoa's buy-up started in a serious fashion only about a month ago. There is a chance that another teacher will be taken away from the school. The problem is that the impact will snowball from there. As the school gets smaller and the level of education drops, whoever is left in town will take their children out because the standard of education will drop. The school will possibly close eventually. That will

impact on the town, because anyone who was considering moving there would not do so because it is a 20 kilometre bus trip to the nearest school. It will impact in the long term.

[11.00 am]

The CHAIRMAN: Alcoa obviously has a land management proposal that will establish larger buffer zones around the refinery. You were explaining that an initial survey by Alcoa showed that what it was offering was not satisfactory to the community. There has been a slight change. Is there any way for the committee to know the overall opinion of the community; whether people think of moving as a satisfactory outcome or whether the majority of people in Yarloop, Wagerup and the surrounding district want to remain where they are? You are saying that is their position, but do you have any way of substantiating that to the committee?

Mr Hall: No, not with me. A lot of the impact statements mention that side of the impacts.

The CHAIRMAN: When the community discussed it, had it any notion of the solution to the issue, which you would like to propose that the committee consider recommending?

Mr Hall: The only acceptable solution for almost all the residents is that Alcoa fix its problems. In the light of that, I cannot honestly see a solution that would please the majority of people. Probably the most acceptable solution would be to move the town. In that way the community would still be together. I do not think that forcing people away and not addressing the problems is the only solution. Once the investigations are completed, possibly the buffer zone will need to be bigger than it is currently. As Alcoa has stated, it is only a noise buffer. It is a very difficult situation. We must look at the health side of it. In doing so, we are not doing ourselves a favour unless we make sure that the community is unaffected.

The CHAIRMAN: When you say move the town, do you have in mind that instead of families and residents moving and scattering, the entire community should be shifted to a safer location but remain together as a community?

Mr Hall: That would probably be one of the better solutions.

Hon FRANK HOUGH: When was the first recorded sickness after Alcoa established the plant?

Mr Hall: I cannot answer that. We have not researched that side of it.

Hon FRANK HOUGH: How far out from the refinery is the radius of the impact that is affecting people?

Mr Hall: Residents in Cookernup, which is approximately six to eight kilometres away, are now noticing the odour. Some are suffering blood noses, burning eyes and that sort of thing.

Hon FRANK HOUGH: Has the increase in sickness occurred since the liquor burner was installed?

Mr Hall: It coincided with that. There was expansion prior to that and another when the liquor burner was installed. I think it was the sheer volume that was coming from all sources. People maybe put all the blame onto the liquor burner, but we do not think the liquor burner is solely responsible. We think the combined aspects of the refinery are causing the problem.

Hon FRANK HOUGH: Is the sickness affecting a particular group of people or is it affecting people across the board; for example, is it affecting children more than elderly people or elderly people more than children?

Mr Hall: It seems to affect people indiscriminately. Everyone seems to suffer in some form. There seem to be different symptoms. Some may be more prominent in one person than another. It is hard to explain. Some people suffer more from headaches, but others may suffer more from lethargy and tiredness. One common symptom is a sore throat and a burning sensation in the eyes and nose.

Hon FRANK HOUGH: What percentage of the population in the vicinity of the plant suffer from sickness?

Mr Hall: I cannot remember the numbers for the populations of Yarloop, Cookernup and Pinjarra.

Hon FRANK HOUGH: Is it 10, 20 or 30 per cent?

Mr Hall: I cannot answer that with any accuracy at all. We have asked the Department of Health to do a proper survey.

Hon FRANK HOUGH: It is not one in every 500 or so?

Mr Hall: It would be more than that. At a guess - I do not know - I would say two people in every 10. It could possibly be even higher. When people talk about the effects, they talk about the same day. It may be a cooler day or when there is a change in the weather. It was put down to viruses and flues, because a lot of people were unaware of what was happening. They were even unaware to a large extent of the Alcoa-Wagerup Community Health Awareness Group, which was formed to deal with the problem.

Hon FRANK HOUGH: Do people working in the plant get sicker than people who live in the outer areas?

Mr Hall: Knowing some of the workers, I would have to say yes, but then some of the residents living very close to the refinery have very severe symptoms as well.

Hon FRANK HOUGH: It would only affect people downwind from the south westerly and north easterly prevailing winds, would it not?

Mr Hall: I would say so, yes, because that is when the inversions form. The sea breezes cause the formation of inversions or intensify the inversions. The prevailing winds from the north east or a northerly direction blow it all down towards Yarloop. One of the problems that has been noticed is that all of the stacks in the refinery more or less line up with Yarloop when the wind is blowing from a northerly direction.

Hon J.A. SCOTT: On page 7 of your statement you state that during the 2000-01 licensing year Alcoa was operating outside the licence conditions for almost all of the year. How was it operating outside the licence conditions?

Mr Hall: It already knew that it would exceed its throughput - that is stated in the Wagerup refinery subcommittee report in May - and that it needed to be addressed. Nothing really was done about it until more or less the end of the licence year. If nothing had been said, would the amendment have been made, or is it because people saw the serious side of it and that it was a lot more widespread? There was a lot more interest in it, and so it was decided that the right thing had to be done and that an amendment should be made.

Hon J.A. SCOTT: On the same page you refer to aluminium oxide. You state that in Queensland there were prosecutions yet our environmental protection agencies have allowed Alcoa to pollute the surrounding areas with levels of aluminium oxide as high 78 000 parts per million. Is aluminium oxide not counted as a pollutant by the Department of Environmental Protection? Is anything to do with the spread of aluminium oxide not on the licence conditions?

Mr Hall: I imagine it would come under that pollutant if nothing else. There have been ongoing complaints about the amount of aluminium oxide in and around Yarloop, and complaints from people living close to the railway line because there have been major problem confining the dust. At one stage, Alcoa did not consider that it was its responsibility but Westrail's. I think the situation has been fixed and it is not as bad as it was.

Hon J.A. SCOTT: Did you say that the Department of Environmental Protection was treating it as an inert substance?

Mr Hall: Alcoa says it is an inert substance and there is no harm, and that there are no health effects from aluminium oxide. Everyone else seems to think that there are effects.

Hon J.A. SCOTT: What was the Department of Environmental Protection's attitude to aluminium oxide as a pollutant and cause of health problems?

Mr Hall: Nothing was done about it. It was registered on the Alcoa-Wagerup Community Health Awareness Group complaint sheets by residents, especially those living alongside the railway line. As I have said, nothing was done about any of the 700 complaints there were sent in.

Hon J.A. SCOTT: You made a comment about hydrogen fluoride and the pitting of windscreens. Do you have any evidence of that, and where did the information come from?

Mr Hall: From claims lodged with Alcoa for vehicle damage in its car park, and also evidence from vehicles on site.

Hon J.A. SCOTT: Would that be at the work site rather than the town site?

Mr Hall: Yes, but people in town experienced it. One lady in particular changed three windscreens in three years. The vehicle's mirrors were damaged as well, but obviously they are not as critical as the windscreen.

Hon LOUISE PRATT: Alcoa told the committee that it has put a lot of effort into new technology to limit emissions, so that it has the capacity to expand production. Do you have any comment about the community's experience of that?

Mr Hall: Our only comment is that whatever has been considered so far, the results are not there. If Alcoa has current technology and emissions are limited, nothing really has changed.

Hon LOUISE PRATT: There is no coordinated plan at this stage to purchase some properties. What process of land resumption would you like to see?

Mr Hall: Quite a few people involved in that side of it feel that the valuation process and the 35 per cent that Alcoa put forward to help with replacement costs, relocating and finding a similar property are totally unfair. There are a lot of discrepancies in the initial valuations because they do not match up with bank valuations, for example, which people have had done for finance for improving their properties. In some cases

there is a \$20 000 or \$30 000 difference between the banks' valuation and that of Alcoa. The banks' valuations are usually lower because they value the property on the basis of a fire sale scenario. They know what they expect to get for a property if they have to sell it because someone cannot keep the payments up.

[11.15 am]

Hon LOUISE PRATT: Do you think these purchases should stop until there is a coordinated strategy?

Mr Hall: It is very hard to say, because some of the people who are affected and who need to get away from there should have the right to move if they choose. It is everyone's right to sell if they choose. It is an individual choice. The committee has not been involved in that, because it is a very difficult area. It is a curly issue.

Hon KATE DOUST: I do not know Yarloop very well. I have not been there for a long time. What portion of the community works at Alcoa?

Mr Hall: In total about 40 people from Yarloop work at Alcoa. Around 20 of those were employed by Alcoa and then moved to the area from elsewhere.

Hon KATE DOUST: People talk about the installation of the liquor burner as the period of change. Did the people in the community and those people who worked at Alcoa pre-1996 ever talk about health issues or raise concerns about any health problems?

Mr Hall: Not to my knowledge.

Hon KATE DOUST: So nothing was identified prior to that period? Is any other type of industry located close to Yarloop or is it only Alcoa?

Mr Hall: We have the timber mill in town.

Hon KATE DOUST: Does the timber mill produce any emissions?

Mr Hall: Smoke comes from the timber burner.

Hon KATE DOUST: Would it have a chemical content?

Mr Hall: I imagine there would be some chemicals. All smoke contains some volatile compounds.

Hon KATE DOUST: Has the community been involved in any discussions with the company about potential engineering solutions to this issue or changes to the processing systems in the workplace that might help alleviate these issues either temporarily or permanently?

Mr Hall: We have sent literature to Alcoa from some of the research that we did in this area to see what was out there, but we have had no feedback on that.

Hon KATE DOUST: Since this issue has come up in the past couple of months, are you aware of any proactive steps the company has taken, such as the range and type of monitoring in the area to assess exposure levels for both workers and the community?

Mr Hall: We have been asking for that to be done, especially within the community. Emissions that may be recorded as being at safe levels at the refinery may not necessarily be at safe levels away from the refinery. There has been no response to that. We also asked about the possibility of the plume sneaking past the ambient area monitoring station, and because certain types of compounds do not disperse. The response was: "What do we do? Do we put a whole line of monitors in position?"

We consider that would be appropriate if that is what it takes to find out what is causing all this.

Hon KATE DOUST: Are you aware whether the company is taking any steps to address these issues through monitoring?

Mr Hall: No, and we did ask for that. Changes to monitoring requirements were made when the last Department of Environmental Protection licence was granted. We asked for a lot more monitoring than existed. We were met semi-halfway on that.

Hon KATE DOUST: Earlier you were asked what solution you would like in place. Other than the sale of properties and the potential movement of the town, has anything else been discussed - perhaps, reviewing the exposure standards regulations and work practices, or any of those sort of things?

Mr Hall: That is a hard question to answer. I know that exposure standards are reviewed all the time. In this case, obviously whatever standard exists is not adequate and needs to be reviewed. I have no doubt about that.

Hon KATE DOUST: What sort of shifts are worked by the people in your community who work at Alcoa? What is the duration of the shifts?

Mr Hall: Generally they are around 12-hour shifts for a maximum of three or four days. I am not sure, but I think they then have five or six days off. It is a good roster.

Hon KATE DOUST: Does the plant work 24 hours a day, seven days a week?

Mr Hall: Yes.

Hon KATE DOUST: We talked about climatic differences. Do the emissions change at different times of the day? Are the odours and emissions greater in the mornings, afternoon or evenings.

Mr Hall: It does not matter. We are more aware of them now because we keep a diary of when our son starts coughing and carrying on. The effects start to show as soon as the weather starts to change and it starts to cool down, and it does not matter whether it is the morning, midday or evening.

Hon KATE DOUST: When you are aware there may be a change in the weather and you may have a problem, what sort of strategies does the community put in place? What do you do to reduce the potential impact?

Mr Hall: As much as we can and, if we have to, we stay indoors. However, we are still affected indoors as it comes in. We cannot keep it out, really. The people upon whom it has a more severe impact leave the area. They leave town because it is that bad. I suppose the rest of us tolerate it and hope that something will happen in the short term.

Hon BRUCE DONALDSON: We have talked about some of the prevailing wind corridors from the north. Is the problem the same when the wind comes from the south? Does that plume still create problems when the wind is from the north?

Mr Hall: Yes; it seems to have an effect when it comes from the south west.

Hon BRUCE DONALDSON: Where is the effect felt then? Has any monitoring been done some distance away from the refinery?

Mr Hall: Not to my knowledge. We have asked for that. Due to the stack heights, and everything else, there is an umbrella effect. When the emissions disperse and

come down they settle further out. We have asked that question and for that matter to be considered, but to my knowledge nothing has been done.

Hon BRUCE DONALDSON: Sometimes windshears come off a range. I wondered whether the windshears were setting up unusual conditions when the wind came from the north and is in line with the stacks. However, you are saying the biggest problem is when the wind is east or north-east. We all know that difficult windshears occur. I wondered whether there would be the same effect if the winds were coming from the south or south west?

Mr Hall: We seem to have the same effects when the wind is from the south-west. In the past three days we have had a cool change and I have had throat problems and what not, and also lethargy. It is hard to get motivated to do something. That is the sort of effect it has on a person. It is like I am tired all the time. That is how it has been in the past three days.

The CHAIRMAN: Following on from that, given the proximity to the south, are there any katabatic wind effects from the scarp that cause strong downdrafts and other places along the scarp? I believe that katabatic winds are prevalent in hot weather conditions and at night.

Mr Hall: I am not too sure about that. All the information I have comes from the results of the 1997-98 review which talked about standing eddies and vortexes. I imagine that is exactly what you are talking about.

The CHAIRMAN: For example, residents in places like Kelmscott and Armadale are very aware that in very hot summer weather at night they will get a really strong down draught off the scarp, which is katabatic wind. Is there any sense among the locals around the Wagerup area of the same prevailing conditions off the scarp? Is that part of local knowledge of what it is like to live there?

Mr Hall: That sort of wind behaviour is predominant there in the late spring and early summer, so that does happen.

The CHAIRMAN: I would like to clarify one last thing, which relates to the appeals on the licence conditions. Am I right in saying that at present under DEP licence conditions for the current volume throughput, the company has to meet no emission targets whatsoever and that the licence conditions apply only to certain volume throughputs and do not relate to environmental performance?

Mr Hall: No, there is a clause that in order to maintain production at 2.35 million tonnes they cannot exceed the emission levels. If they do they have to reduce production to 2.2 million tonnes.

The CHAIRMAN: Where is the production of 2.2 specified? Given that the figure of 2.2 was on a volume throughput basis with no specified emission levels, how does the DEP define the 2.2 million tonne target that it is now saying must be met even at greater volume throughput?

Mr Hall: I imagine that comes from Alcoa's sampling and monitoring that it does on its stacks and the general monitoring requirements imposed by the DEP.

The CHAIRMAN: Obviously the committee will discuss that with the DEP, but I wanted to clarify that for my understanding for the rest of the day.

Hon J.A. SCOTT: Does the timber mill burn every day?

Mr Hall: It occurs a lot less now than even five or six years ago. That mill was there before the town was built. As far as I am aware from talking to people who were born there, the mill has not caused adverse health effects. Alcoa's environmental review incorporates the timber burner and says its effects would be negligible.

Hon J.A. SCOTT: I wonder particularly about inversions and the possibility of their linking up with Alcoa's emissions in the ozone and stuff like that. Has anybody looked at the days on which the emissions are greater to see whether the timber mill is also operating and there may be a joint impact from the two through the emissions coming together?

Mr Hall: It is quite possible that that is the case. However, when the winds are from the north or the north west, for example, the people on the north side of the refinery, who are closest to the refinery, still feel the most impact. I feel that if that had a major influence the people on the south side in that instance would feel the most impact from those emissions rather than those who are on the north side. I guess that it is unlikely it has a major input.

Hon FRANK HOUGH: A submission was read out from the Yarloop-Wagerup Community Health Awareness Group. What percentage of people from Yarloop and districts does this document cover? Is it five, 10 or 50 per cent?

Mr Hall: The committee was elected at a town meeting that was called to deal with the proposed buffer zone expansion. The need for a committee became evident there, and about 120 or 150 townspeople - somewhere around that number - elected the committee.

The CHAIRMAN: When was that?

Mr Hall: About August-September last year.

Hon FRANK HOUGH: What percentage of the residents of Yarloop and districts do those concerned residents who elected the committee represent?

Mr Hall: I would say that a minimum of at least half of the residents would back us up 100 per cent.

Hon FRANK HOUGH: I thought Yarloop and Pinjarra had several thousand residents.

Mr Hall: No. People from Yarloop, Cookernup - which is right alongside it - and Hamel attended. They are the districts represented.

The CHAIRMAN: The committee may call you at a later stage with some questions. Thank you for the evidence that you provided not only today but also in the written submissions, which are interesting for our work.