EVIDENCE TAKEN BEFORE

GENERAL PURPOSE STANDING COMMITTEE NO. 5

INQUIRY INTO THE NORTHSIDE STORAGE TUNNEL— SCOTTS CREEK VENT

———

At Sydney

On Wednesday, 9 August 2000

The Committee met at 10.00 a.m.

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PRESENT

The Hon. R. S. L. Jones (Chairman)

The Hon. P. Breen
The Hon. Jan Burnswoods
The Hon. J. H. Jobling
The Hon. J. R. Johnson
The Hon. A. B. Manson
The Hon. J. F. Ryan

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CHAIR: I welcome the media and members of the public to this hearing of General Purpose Standing Committee No. 5 for its inquiry into the Northside Storage Tunnel—Scotts Creek Vent.

Under Standing Order 252 of the Legislative Council, this Committee has resolved to authorise the media to broadcast sound and video excerpts of its public proceedings held today.

The Committee's resolution conforms with the guidelines governing the broadcast of proceedings adopted by the Legislative Council on 11 October 1994. The Attendant on duty has copies of these guidelines.

I emphasise that only members of the Committee and the witnesses before them may be filmed or recorded. People in the public gallery are not considered to be part of the proceedings and, therefore, should not be the primary focus of any filming or photographs.

In reporting the proceedings of this Committee, as with reporting the proceedings of both houses of Parliament, you must take responsibility for what you publish or what interpretation is placed on anything that is said before the Committee.

Members of the public: I wish to advise you that committees are regarded as extensions of the Legislative Council, governed for the most part in their proceedings by the same rules which prevail in the House.

While the Committee welcomes members of the public, you should observe the same courtesies as are expected of the public attending when the House is sitting.

Visitors in the public galleries are required to refrain from any interruption to proceedings or discourtesy to the Legislative Council, particularly any interjection or demonstration of support or dissent in relation to these proceedings.

There is an attendant on duty who will assist visitors. Should you have any particular requests, you should advise the attendant on duty.

ALEXANDER WALKER, Managing Director, Sydney Water Corporation, 115-123 Bathurst Street, Sydney, affirmed and examined:

RONALD EDWARD QUILL, General Manager, Asset Solutions, Sydney Water Corporation, 115-123 Bathurst Street, Sydney, sworn and examined:

ALLAN DOUGLAS HENDERSON, Manager, Capital Programs, Sydney Water Corporation, 115-123 Bathurst Street, Sydney, sworn and examined:

PETER JAMES FISHER, Manager, Product Delivery, Wastewater, Sydney Water Corporation, 115-123 Bathurst Street, Sydney, sworn and examined:

CRAIG BARTON, Georges River Wastewater Product Delivery Manager, Sydney Water Corporation, 1 Moore Street, Liverpool, affirmed and examined:

ALEC EDWARD DIETSCH, Engineering Manager, Northside Storage Tunnel Alliance, 403 Pacific Highway, Artarmon, affirmed and examined:

ANDREW STANLEY WILD, Environmental and Regulatory Manager, Northside Storage Tunnel Alliance, 403 Pacific Highway, Artarmon, affirmed and examined:

JOHN WILLIAM CALLAGHAN, Senior Associate, Connell Wagner Pty Limited, and Design Manager, Northside Storage Tunnel Alliance, 116 Military Road, Neutral Bay, sworn and examined:

CHAIR: Mr Walker, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr WALKER: I have.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr WALKER: I am.

CHAIR: Mr Quill, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr QUILL: Yes, I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr QUILL: Yes, I am.

CHAIR: Mr Henderson, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr HENDERSON: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr HENDERSON: I am.

CHAIR: Mr Fisher, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr FISHER: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr FISHER: Yes, I am.

CHAIR: Mr Barton, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr BARTON: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr BARTON: Yes.

CHAIR: Mr Dietsch, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr DIETSCH: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr DIETSCH: Yes, Mr Chairman.

CHAIR: Mr Wild, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr WILD: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr WILD: I am.

CHAIR: Mr Callaghan, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr CALLAGHAN: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr CALLAGHAN: I am.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you wish to make any opening statements?

Mr WALKER: I would, please, Mr Chairman.

CHAIR: Please go ahead.

Mr WALKER: I would like to thank the Committee firstly for allowing Sydney Water the opportunity to express its views on this Northside Storage Tunnel project and in particular the many benefits the project offers to the residents and visitors of Sydney.

Sydney Harbour is of major significance to the city. Pollution of Sydney Harbour, especially following wet weather, is a key issue of community concern. Wet weather sewage overflows can make Sydney beaches unsuitable for swimming after heavy rain and raise public health concerns for recreational use of the harbour.

Untreated sewage that flows into the harbour from overflow points can not only increase the numbers of infectious organisms in the waterways but also increase odours and the presence of sewage matter. Pollution of Sydney Harbour is clearly in need of urgent redress.

As the Committee is aware, Sydney Water has designed the Northside Storage Tunnel as an early action measure to improve water quality in Sydney Harbour. Currently, there are four overflow sites north of the harbour—at Lane Cove River, Quakers Hat Bay, Tunks Park and Scotts Creek—which discharge the greatest volume of diluted sewage into the harbour. During a single heavy storm these overflow sites together discharge hundreds of millions of litres of sewage into Sydney Harbour, posing a significant health risk to the community.

When operational, the Northside Storage Tunnel will capture 80 to 90 per cent of wet weather sewage overflow from these four points. It must be noted that the Northside Storage Tunnel is not a duplication of the Northern Suburbs Ocean Outfall System [NSOOS].

The tunnel will convey the captured wet weather sewer overflows to the North Head Sewage Treatment Plant for treatment. Excess water will be stored in the tunnel for processing as soon as capacities allow. The tunnel will provide additional capacity for sewage in emergency situations such as power failure at the North Head Sewage Treatment Plant. This will prevent the plant from going on to bypass.

As the Committee is aware, the plan to clean up Sydney Harbour through the construction and operation of a tunnel extending from Boronia Park and Scotts Creek to North Head began in early 1997 with approval for the project from the then Minister for Urban Affairs and Planning given in December of the same year.

From the very onset of the project, Sydney Water has conducted full community and stakeholder consultation, applied the precautionary principle in conjunction with other principles of ecologically sustainable development [ESD] and has undergone formal reviews into the project by bodies such as the Waterways Advisory Panel, the Department of Urban Affairs and Planning and the New South Wales Parliament's Legislative Council.

The tunnel project has been subject to a rigorous environmental assessment process by regulators with extensive community input. In fact, Sydney Water has held over 330 community meetings to discuss the tunnel and related issues since December 1997 to ensure that community views are appropriately addressed.

Sydney Water and the Alliance have prepared five sets of reports on the tunnel, including the 1997 environmental impact statement [EIS] and subsequent reviews of environmental factors. All reports have been prepared in accordance with the provisions of the Environmental Planning and Assessment Act 1979 and placed on exhibition for public comment.

These reports were supplemented by representations reports which discussed and responded to in detail to the community's concerns. These reports have been considered and approved by the Department of Urban Affairs and Planning, which has granted over 30 licences and approvals that applied to the design, construction and operation of the Northside Storage Tunnel. In addition, compliance audits are also conducted for these regulatory approvals and licences.

The Northside Storage Tunnel will reduce the frequency and volume of overflows to the environment at Scotts Creek, reducing the number of overflow events from the aqueduct from approximately 20 per year to approximately two per year. This means a considerable improvement on the current situation where the public is exposed to diluted sewage overflows.

To enable the Scotts Creek overflow connection to operate under all wet weather conditions, it is necessary to provide an intake/exhaust ventilation facility at the Scotts Creek end of the tunnel.

The primary concerns of local residents at Scotts Creek are the potential for health impacts from the operation of the ventilation facility and the proximity of this vent to residential areas. To appropriately address the concerns, Sydney Water extended the consultation process for the Scotts Creek site to include mediation with the local community.

Sydney Water and the Alliance engaged numerous independent consultants and sought advice from the New South Wales Health Department to examine the potential health impact of the Scotts Creek vent. Dr Stephen Corbett of the New South Wales Health Department found that:

> Based on the information provided, the emissions from the tunnel vents will not impact on human health.

Moreover, numerous studies in the vicinity of sewage treatment plants have shown no significant health effects either to workers or to the communities who live and work around the plants. There is absolutely no evidence to suggest that there will be emissions of unidentified toxic compounds that will affect the health of residents or schoolchildren in the neighbourhood of the vent.

Sydney Water has repeatedly assured the community that the filtered ventilation system at Scotts Creek has been designed and installed to meet licence conditions and ensure there is no impact on air quality under all circumstances. Specifically, this means that no offensive odours or adverse air impacts will result from the vent's operation.

As with all activities and operations, Sydney Water will operate the Northside Storage Tunnel in accordance with the regulatory requirements for community health established by the New South Wales Health Department, the Environment Protection Authority [EPA] and the Department of Urban Affairs and Planning [DUAP].

Additionally, the Environment Protection Authority will regulate the granulated activated carbon filters that will effectively control and eliminate possible impacts and safeguard the community.

Sydney Water is satisfied that expert advice provided to the corporation has indicated that the level of concentration of potential contaminants would be minimal and well below the level that would have any possible adverse health and/or amenity impacts in the Scotts Creek area.

The corporation believes there is no justifiable reason to consider moving the exhaust point of the Scotts Creek ventilation facility away from the Scotts Creek site and that the Northside Storage

Tunnel, including the Scotts Creek vent, will be a significant improvement to public health from the current situation.

This position has been supported in the findings of the Waterways Advisory Panel's second report into the Northside Storage Tunnel. The panel concluded that the Scotts Creek vent will operate effectively and with minimum risk.

There have been allegations made against the Northside Storage Tunnel. These allegations are baseless. No evidence has been produced to support allegations that air emitted from the vent is a real threat to public health.

As shown by numerous independent studies, including by New South Wales Health, the Northside Storage Tunnel will only reduce the health risks associated with sewage overflows. The current situation, where sewage flows uncontrollably from overflow points, including at Scotts Creek, will be virtually eliminated by the operation of the Northside Storage Tunnel.

Similarly, the environmental benefits of the tunnel are significant. Not only will the numbers of unsafe swimming days at Lane Cove River be halved, leaving the waterway suitable for a predicted 346 days each year, but the tunnel is also expected to reduce nutrient loads in the harbour. This means reduced algal growth rates and a better marine environment for aquatic flora and fauna.

Additionally, the Northside Storage Tunnel will significantly reduce visible pollution and sewage odour of the harbour, leaving a cleaner and healthier harbour for everyone to enjoy. Thank you, Mr Chairman.

CHAIR: Any other statements from anybody else?

Mr WALKER: That is it for now.

CHAIR: Thank you very much.

The Hon. J. F. RYAN: Mr Chairman, was that a written statement given by Mr Walker. Did you read from a prepared written statement?

Mr WALKER: I did, Mr Chairman.

The Hon. J. F. RYAN: It would assist us no end if we could have copies of that, if that is at all possible, because it will take a day for Hansard to get us one.

CHAIR: Mr Walker, have you brought with you the manufacturer's specifications for the activated carbon filters that have already been placed at Scotts Creek?

Mr WALKER: No, we do not have the specifications with us today.

CHAIR: I did send a letter to Sydney Water a few days ago saying that I would ask questions about this at this hearing today. That has not been addressed, apparently.

Mr WALKER: We are prepared to answer questions on the filter.

CHAIR: Can you tell me whether these filters have been designed by the manufacturer to filter out bacteria and viruses?

Mr WALKER: Mr Alec Dietsch is best able to answer that question, Mr Chairman.

Mr DIETSCH: The granulated activated carbon filters are designed primarily for the removal of hydrogen sulphide, mercaptans and odour-generating materials, and that is for the purpose of meeting the original EPA guidelines and licence requirements with respect to those materials.

CHAIR: So the filters were not designed to and will not effectively remove bacteria and viruses?

Mr DIETSCH: They were not specifically specified for bacteria and viruses.

CHAIR: Can anybody tell me what bacteria and viruses will be emitted during times of venting the tunnel 20 or 30 days a year?

Mr WALKER: We believe that is an issue that is best left to the Department of Health representatives.

CHAIR: So the Department of Health has not advised you then; is that what you are saying?

Mr WALKER: We have accepted their advice on the overall health implications of the vent and we have included in our submission to the Committee the advice that was received in a letter from the Director-General of the Department of Health to me.

The Hon. A. B. MANSON: Were those activated carbon filters the appropriate choice for this job?

Mr WALKER: Could I refer that question, please, to Mr John Callaghan of Connell Wagner?

Mr CALLAGHAN: The original EIS that was prepared by Sydney Water nominated activated carbon filters as the appropriate technology. The Alliance project team then undertook its own assessment of what was an appropriate technology to filter the air at the vents at Lane Cove and Scotts Creek and also at the other sites, including North Head.

We also took specialist advice from Kerry Holmes and from Terry Schultz of CH2MHill, who are renowned odour specialists, and we formulated what we considered appropriate technology, looking at the various options available and also how the tunnel operates, the fact that it is intermittent by nature, it does not operate very often and so it needs a particular type of technology that best suits that approach.

We selected impregnated granulated activated carbon as the appropriate technology, based on all of that advice. That happened to be endorsed by DUAP's independent expert, Frank Fleer, in a report that he provided to DUAP at the time, and we also took advice from Sydney Water.

So, based on all of that design approach, independent advice looking at what was world's best practice and appropriate technology, we selected the impregnated activated carbon filters for Scotts Creek.

CHAIR: You would be aware that in your report on page 37 you talk about the expert panel, which found:

> In summary, the experts have not reached a point of agreement on the public health impacts of the proposed vent with its current configuration. One expert has abstained as he considers that the issue of health impacts is outside his area of expertise. The remaining five experts agree that the health impacts are difficult to quantify, but will not be of epidemic proportions. However, three consider that the public health impacts will be minimal and the other two consider that there is a risk of some discernible impact.

Clearly, in your own report it is said that the experts disagree on the health impacts of the emissions from the vent, so how do you respond to that?

Mr WALKER: Mr Chairman, we have relied on the overall assessment carried out by the New South Wales Health Department predominantly. New South Wales Health has had access to all of the expert advice and is best equipped to weigh up that advice and make an overall assessment. That assessment has been delivered to this Committee and to Sydney Water in writing, and it talks about the assessment of pathogens in aerosols from the vent.

If I may quote from the letter from New South Wales Health Department to yourself, it says that the theoretical possibility of pathogens being transmitted to people through aerosols has been assessed and these eventualities are not likely, even in extreme operating conditions and that, therefore, the proposal does not constitute a threat to public health.

CHAIR: Yet other experts disagree with that.

Mr WALKER: I repeat that I rely on the advice of the New South Wales Health Department to make that overall assessment.

CHAIR: On page 42 of your submission, you say that the tunnel will be operated and maintained to ensure that the environment is not conducive to the growth of Legionella. Can you explain to me how that will be done?

Mr WALKER: Perhaps, first, in answering that question I could quote the written advice from Professor Charles Kerr of the University of Sydney which was delivered in this particular case to the chairperson of the school council of the Glenaeon Rudolf Steiner School specifically on the issue of Legionella. He wrote on 6 July 2000:

> I appreciate your continuing concern about the project. As to the legionellosis situation, I never regarded it as a 'high potential risk' but as a possible infectious hazard mainly because a large majority of infections have arisen with enclosed built environments via contaminated water towers of airconditioning systems. The risk of any exposure in open air would, of course, be very much smaller. As I understand it, Legionella bacteria need a stagnant environment to thrive and any sort of flushing, even with raw sewage, would be enough to prevent them building up in a biofilm.

If I could give that, perhaps, as background to the answer to your question.

CHAIR: And then, "I discussed my previous conclusions with Professor Ray Kearney about infectious diseases", who is a national authority on Legionellosis and then Professor Kearney has different views. Now, no doubt, he will be giving those views later on. So he defers to Professor Kearney.

Mr WALKER: You asked me a question, Mr Chairman, about the operating conditions of the tunnel and how that would relate to Legionella. Professor Kerr summarised the key issues, which is the issue of a stagnant environment and his statement is that any sort of flushing, even with raw sewage, would be enough to prevent them building up in a biofilm.

Now, in summary, the tunnel has been designed in such a way that it will not create a stagnant environment, that it will flow quickly to remove all of the liquids and other waste material. Also, there is provision for flushing of the tunnel after it has operated. They are the key answers to your question which relate specifically to Professor Kerr's assessment of the conditions relating to the build up of Legionella.

CHAIR: You note in that letter he talks about Professor Ray Kearney, and Professor Kearney says in his letter in relation to the vent at Scotts Creek that:

> Caution as a duty of care must be adopted. Thus, in the balance of evidence it is likely that the emissions arising from such a vent upon cumulative exposure threaten to harm human health. To prevent such threats, precautionary measures should be taken whilst there is a lack of certainty.

Professor Kearney has a different view and he is the national authority on Legionella and Professor Charles Kerr defers to him. So how come you do not quote a greater expert than Professor Kerr who says there is a problem?

Mr WALKER: I do not think that one expert contradicts the other on the conditions for Legionella build up within the tunnel. Your question was in relation to the operation of the tunnel. The tunnel does not present conditions conducive to the build up of Legionella. I know that that has been assessed as part of the overall health assessment by the New South Wales Department of Health which has concluded that there is no health risk.

The Hon. A. B. MANSON: On the site visit on 26 July, there was some mention that these filters were going to be monitored and were going to be operating a few times a year but while they are in operation, what sort of safeguards are there to ensure that they are properly controlled and monitored?

Mr CALLAGHAN: Firstly, there is a number of quite prescriptive conditions that have been put in place by DUAP which Sydney Water must comply with. A lot of those are related to the testing of the filters in an operational sense. For example, the activated carbon filters will be sampled in three separate locations within the beds, without getting too complicated, and they will be done on a quarterly basis in the first year of operation.

That information will be analysed for hydrogen sulphide absorptive capacity and things like that. The results of that will give us an ability to forecast the life of the bed. So we will be able to get a pretty good handle of how that bed will complete over time. It is a requirement that they be replaced when they reach 80 per cent of their capacity, so well before the life of the beds are reached.

After the first year, there will be regular sampling, frequency and analytical testing of that, but that is to be done in conjunction with the EPA. So, once they do that first year of sampling and get an idea of what is happening, Sydney Water will sit down with the EPA and develop an appropriate testing regime for the life of the filters.

A number of things are monitored continuously: hydrogen sulphide; the flow rate through the filters; and the temperature of the filters, which is important. There is continuous monitoring that is actually hooked into Sydney Water's telemetry and SCADA [Supervisory Control and Data Acquisition] system, so that information will go back to Sydney Water's operating control centre. There will be alarms and data recording of all that information, real time information.

So all of those sorts of things are tied into the operating phase and they are all linked to the conditions that DUAP embedded into the conditions of consent that Sydney Water has. All of the standards that we have taken are in line with European and American standards, so they are consistent with well-adopted procedures for monitoring. Sydney Water's operating centre is a 24-hour operating system.

CHAIR: A quick follow-up to that question. Which pathogens are being monitored?

Mr CALLAGHAN: The monitoring processes are related to the conditions that are embedded in DUAP's conditions for Sydney Water.

CHAIR: But you cannot tell me which pathogens are actually being monitored, or are any being monitored?

Mr CALLAGHAN: I am not aware of any pathogens that are being monitored.

The Hon. J. H. JOBLING: Could I look at, Mr Walker, please, the actual filtration itself of the granular filters? It is my understanding that whether you use activated carbon or an aluminium type it is accepted that such a filter is not effective in trapping microorganisms such as Legionella. Are you in agreement with that general scientific theory?

Mr WALKER: Well, on the specifics of the filters, I would have to defer to my better informed colleague, particularly Mr Callaghan.

Mr CALLAGHAN: The design of the filters is predominantly to remove odorous materials.

The Hon. J. H. JOBLING: So what I am looking at on this basis is if, as you say, the tunnel itself will not be a major source of pathogens or Legionella, would you agree, then, that in actual fact the granular filter could provide that source by trapping Legionella and allowing it to grow inside the carbon filter as a non-effective extractive matter?

Mr WALKER: Could I perhaps, Mr Chairman, again refer to the assessment of the overall performance of the vent in relation to the aerosol-conveyed pathogens by the New South Wales Department of Health? In its assessment, it specifically commented, firstly, on the potential formation of microladen aerosols and then went on to talk about the potential for these aerosols to travel up the vent and through the activated granulated charcoal filters. The assessment said:

> Before discharge the air and any aerosols must pass through a pre-filter and an activated granulated carbon filter. It is the opinion of expert microbiologists that it is very unlikely that any aerosols would pass through the charcoal filter to be

> dispersed into the atmosphere, in which case there would be no mechanism for the transmission of disease by this route. This hypothesis could be tested experimentally to ascertain the permeability of the filters for aerosols under simulated operative conditions.

CHAIR: Has it been tested?

Mr WALKER: It has not, but we have accepted that that is something that we could do as a recommendation.

The Hon. J. H. JOBLING: Are you proposing to do it, Mr Walker?

Mr WALKER: We are prepared to do it or to work with the New South Wales Health Department to devise a test.

The Hon. J. H. JOBLING: In view of the generally accepted scientific comment that you need a high-quality particulate filter to get rid of Legionella and other pathogens, and in fact the accepted view that a disease transmission distance of a hundred metres is apparently easily able to be traversed by airborne Legionella, or you require meteorological conditions—in other words, a little sun, warm air, middle to high humidity and a little breeze—what do you then say to the comment of Dr Corbett on 19 July where he advises that the mechanism proposed for Legionella growth within the activated carbon filter was now considered sufficiently credible by the Health Department to warrant further investigation? Are you aware of that statement of Dr Corbett's?

Mr WALKER: First, if I may look at the whole question, Mr Chairman, which talked about introduced Legionella as an issue, the issue is not just whether Legionella can be transmitted or trapped in the filter; it is firstly what numbers it may reach in the filter in the particular operating conditions of this vent and this tunnel and, again, I quote from the assessment by the New South Wales Health Department, which talks about those pathogens which may be conveyed by aerosols. It says:

> An exception to this may be Legionella, which is present in small levels in sewage. Conditions in sewage are, however, not conducive for Legionella proliferation, particularly in the storage tunnel as Legionella requires warm—that is, above 30 degrees—undisturbed water to proliferate and reach levels sufficient to cause disease.

Then there is the issue of whether even if those levels in the tunnel are relatively minor, which is what that assessment says to me, how much of it is capable of reaching in aerosols through the shaft?

CHAIR: Mr Walker, Legionella can breed well below 30 degrees Centigrade and at a lower temperature it becomes more virulent, so temperature is not a matter here. At 30 degrees it is actually more virulent. Are you also aware that they do grow Legionella in activated carbon?

Mr WALKER: Mr Chairman, if I may, I am quoting from the assessment by the New South Wales Department of Health. So far as I am concerned—

CHAIR: They are world experts?

Mr WALKER: That is a capable overall assessment.

The Hon. J. H. JOBLING: As there have been a number of interruptions, may I take Mr Walker back to the question? It was not to do in this case with the tunnel itself, not to do with the matter that may be floating in the tunnel; it was dealing with, in fact, the filters and, therefore, whilst I am not cavilling with your argument of the tunnel, I bring you back to the question of the activated carbon filter, the statement from Dr Corbett and also a further one which was sent to the Director-General of the Health Department in correspondence of 7 June, which simply states that the formation of potentially infectious aerosols in the filter was brought to the attention of the Director-General on that date.

Now, what I come back to is that he is now saying that the mechanism proposed for Legionella growth within the activated carbon filter was considered sufficiently credible by the Health Department to warrant further investigation. My question, which I bring you back to, was: were you aware of that statement and has it been brought to your attention?

Mr WALKER: No, I am not aware of that, Mr Chairman.

CHAIR: You should be, surely.

Mr WALKER: Well, I do not see how. It does say in the quotation that Mr Jobling just read out that these matters were brought to the attention of the Director-General. I assume it is the Director-General of Health, who is the person who we are bound to rely on for advice in this matter.

The Hon. J. H. JOBLING: Okay. Let that stand for the moment. You are therefore saying that the Director-General and/or the Department of Health have not advised you of this view. Well, have they or have not they?

Mr WALKER: They have given us an overall assessment of the health implications of this vent.

The Hon. J. H. JOBLING: From 19 July?

Mr WALKER: Specifically in writing they have referred to Legionella as a risk, and the emphasis of their argument, which is persuasive to me—

CHAIR: What date is that argument?

Mr WALKER: Sorry, what date is that?

CHAIR: Yes.

Mr WALKER: The particular copy I have is 4 August.

CHAIR: Which year?

Mr WALKER: 2000.

The Hon. J. H. JOBLING: So you are saying to me that, in fact, this particular matter—Dr Corbett from the Health Department—has not brought specifically to your attention and, to follow that on, has the chief medical officer, as requested by Dr Corbett undertaken, to your knowledge, to convene an independent expert panel to assess that risk?

Mr WALKER: Mr Chairman, could I suggest that these questions be referred to Dr Corbett himself?

The Hon. J. H. JOBLING: They will be, Mr Walker, but what I am trying to understand is what does Sydney Water know? What have you been told? On what are you basing your assumptions? I repeat, have these questions been drawn to your specific attention or the attention of your officers so that if you did not know, they may?

Mr WALKER: To my knowledge, the detail has not specifically been drawn to my officers' attention, and that is how Mr Jobling puts it, Mr Chairman.

The Hon. J. H. JOBLING: Would you be concerned then, Mr Walker, in relation to the statement, that it should have been perhaps drawn to your attention so that you can put in place a mechanism to make is a very, very safe vent? That would be your desire, would it not?

Mr WALKER: Mr Chairman, I am not concerned about that. I am satisfied that New South Wales Health has had access to all of the expert advice, is the competent authority to make an overall assessment, has given me its overall assessment in writing and is prepared to appear or is subpoenaed, I guess, to appear before this Committee to support that.

CHAIR: I refer you to the final report on mediation between Sydney Water and the community of the Scotts Creek area. We have a comment on paper by Charles Kerr on whom you have been relying where he says that the storage tunnel could, if inadequately maintained after being filled,

provide a suitable habitat for Legionelli that would multiply in water favoured also by slime-creating organisms. Moreover, cool conditions in the tunnel will be associated with increased virulence of Legionelli, which is a temperature-dependent characteristic of this bacteria.

So even your expert says that is a problem and you have evidently been using selected expert advice and ignoring other expert advice.

Mr WALKER: The letter that I read from Professor Kerr was subsequent to that particular information there, Mr Chairman.

CHAIR: Do you think this expert would have changed his mind?

Mr WALKER:. I think he clarified the position in writing on 6 July.

CHAIR: You are aware of this report, presumably?

Mr WALKER:. I certainly am. Some people here spent many hours with the mediation process.

CHAIR: That is another matter which we might come to in a minute.

The Hon. A. B. MANSON: Mr Henderson, I heard a suggestion during the site visit on 26 July that the Scotts Creek venting system ought to be piped back to Manly. Could you tell me, in addition to the additional cost that would represent, is this a logical or an acceptable proposal?

Mr HENDERSON: Sydney Water believes this is not an acceptable proposal, whether it is technical, social or economically viewed. Apart from the actual cost of the pipeline itself, there are other costs to consider and there are technical issues to consider. There is the environmental assessment to consider which would, no doubt, delay the operation of the tunnel.

If we even disregard the cost implications which are quite considerable themselves—we are talking about in the order of $30 million for the pipeline—there could be additional costs for on-site structures. There would be additional costs for an environmental assessment process. That process could take anything up to one or even beyond, maybe two years, and could delay the implementation of the tunnel, and it could delay the time frame when the tunnel could be available for the people of Sydney to benefit from.

It would increase the amount of maintenance required for the tunnel system. There would be additional facilities to be maintained. It would reduce the available volume in the tunnel to accept overflows, and that would reduce the environmental performance of the tunnel.

There is a very real chance that it could not be justified in an environmental assessment process and, if it went to that stage, may well lead to a question of whether the tunnel could be acceptable to operate. So we cannot see any reason whatsoever in a technical, environmental, social or economic sense that that alternative be considered.

The other point that we need to note is, if it was implemented for the Scotts Creek vent, it would necessarily have to be implemented for every other overflow location, and that would include Lane Cove or the Lane Cove River west location which is in the Hunters Hill municipality. That would increase the cost again.

It would severely restrict the amount of volume in the tunnel between Tunks Park and Lane Cove and make maintenance of that section of the tunnel extremely difficult. So that is a technical reason far above the cost of the tunnel that would reject that option.

The Hon. A. B. MANSON: Obviously, this is not the only tunnel of this type in the world and you have probably investigated other tunnels throughout Australia and the world. Can you tell me what sort of investigations you have undertaken and what the results of those investigations are?

Mr HENDERSON: Tunnel storage systems for sewage overflows are quite common in the world. There is no other one as we know it in Australia, but overseas they are common. They vary in size considerably. There are very large tunnel systems in the United States, in Chicago and in Rochester in the State of New York, and in Milwaukee, Wisconsin. There are smaller tunnels in Europe. One in Stockholm, Sweden, is only one and a half kilometres long, but it was designed on a similar principle.

We have made inquiries of these tunnels, particularly the ones in the United States, and to satisfy ourselves on how effective they were to operate, we visited a tunnel system in Rochester in New York State which we believe was probably the closest to the system that we are implementing in Sydney.

CHAIR: With a vent every kilometre?

Mr HENDERSON: It had a number of vents but they were similarly designed to our ventilation systems. They were vented at each of the inflow points. We inspected a number of those inflow points. They had the same principles in the design of those inflow points and the same principles for allowing the air to escape when it was necessary.

We questioned the operators of that system on any concerns from the community and any health impacts from the communities in those areas and we were told there was no impacts whatsoever, that the tunnel system had been extremely effective.

The Hon. P. BREEN: Under the potential health impacts, you have referred to the tunnel being operated and maintained to ensure that the environment is not conducive to the growth of Legionella, and you emphasised the tunnel being operated and maintained. I am anxious to know whether or not there will be any period in which there is no sewage material in the tunnel, when it will be empty.

Mr WALKER: Perhaps for the detail of that I will refer to Mr Dietsch.

Mr DIETSCH: As we said earlier, the tunnel is intended to operate only intermittently and is based on the occurrence of storm events which would lead to the surcharging of the NSOOS system which would otherwise cause an overflow into the environment.

In the earlier modelling which we have done during the EIS and at the beginning of the project when the project was being developed, it was estimated that the tunnel would be in use, in other words, that it may have some dilute sewerage in it for 20 to 30 days per year. As the tunnel design has progressed, we have been reviewing that information and, now that we have the current design information, the current volumes in the tunnel and the current operating philosophies and control systems, we have a much better view and the current modelling indicates that the tunnel may be in use for between 15 and 20 days a year. So we are looking at something between 340 and 350 days a year when the tunnel would not be in operation.

The Hon. P. BREEN: It will be completely empty?

Mr DIETSCH: Completely empty, and in its stand-by mode it is continuously ventilated by air which is drawn in by North Head, so there is fresh air being drawn in through Scotts Creek and Lane Cove for all of the rest of that time.

The Hon. P. BREEN: In the time when it is empty, will there be any parts of the tunnel where it is possible that there might be a stagnant pool of water where bacteria or Legionella might collect?

Mr DIETSCH: The design of the tunnel is a continuous grading tunnel. It has fairly relatively flat slopes, but it slopes from both Scotts Creek and from Lane Cove all the way to North Head and it varies, depending on the geological features that it had to pass through.

At the moment, we are in the process of completing the concreting of the base of the tunnel and we have set fairly tight constraints on what the accuracy for ponding in that is and, therefore, we do not expect any significant ponds of material.

In addition to that, because of the depth of the tunnel, and it is essentially below the groundwater system, there is always positive groundwater pressure in the tunnel, so there is infiltration into the tunnel of slightly salty water in most of those areas. That, at the moment, based on our current information, is estimated to perhaps be four to five megalitres per day that will flow through the tunnel. So that fresh water will, in fact, flush through any of the ponding that happens to be in the base of the tunnel.

The Hon. P. BREEN: How often will that happen?

Mr DIETSCH: That happens every single day because it is essentially groundwater that is leaking in through the sandstone into the tunnel. It is running down the base of the tunnel through North Head and it is being pumped out through the North Head Sewage Treatment Plant. During that particular time, of course, we are also ventilating continuously, so we are continuously drawing in fresh air.

The Hon. P. BREEN: If a pump were to break down, have you done any tests on how long it might be that there would be material in the tunnel? What concerns me is that when we were out there for our inspection, the tunnel was being called not only a storage tunnel but also a transfer tunnel. I could not help getting the impression that the use of the tunnel might be more significant than certainly appears in your answer and in the documentation.

If the tunnel were to be used more than anticipated and if the pump broke down, for example, there is a possibility that material stored in the tunnel could be the subject of breeding Legionella, so I am concerned about what sort of tests have been done to see what would happen if, for example, the pump broke down and there were materials stored in the tunnel for an extended period.

Mr DIETSCH: Essentially, at the moment, we have two. There are a number of pump systems and there are a number of back-up systems within the tunnel, so there are two main tunnel pumps which are designed to lift the dilute sewage from the low level, which is about 104 metres below sea level at North Head, to the intermediate point at which the NSOOS enters the North Head facility. At that particular level when the project is finished there will be six pumps, of which there will be two spares, so there is, essentially, the capability to operate if there is a minor failure on the lowest level, two spares on the next level and substantial duplication and redundancy in all other things.

We currently have two dewatering pumps which are intended to remove the infiltration water, so there is a full duty and a spare, and in addition to that there are some pumps which can also pump out from that level, and there is always a duty and spare. So we always have duplication of all facilities at North Head facility.

If there is ponding, as you would define it, we believe that it would be extremely minor. It is proposed in terms of operation that Sydney Water will go into the tunnel, it is expected, somewhere between eight and 10 times in the first year, maybe 12, and they will do a full inspection of the whole tunnel so that they actually understand what is in the tunnel and what they need to do about it and whether, in fact, they need to modify any of their operating procedures.

In addition to that, if there are materials as you have described, which we do not believe will occur because of the conditions that pertain, when the next overflow occurs, then, essentially, at the start of the overflow as the tunnel is filling, the velocities in the bottom of the tunnel are relatively high, and modelling indicates that there will be entrainment of any of the sediment material, most of which will be sand and grit, which is the material which currently sits in the bottom of the NSOOS system, and that that will be washed to North Head and pumped out. So, in other words, if there is anything in the tunnel, all the time between operations it is being ventilated through to North Head and when the next overflow occurs it is flushed to North Head, so it never goes backwards because of the continuous slope and flow direction of the overflow capture and the air ventilation.

CHAIR: Just for clarification, in the operational environmental management plan [OEMP] on page 10, which no doubt you are familiar with, it says that the tunnel will have wet sewage overflow in it for 30 to 40 days a year. Is that actually correct or is it less than that or more than that?

Mr DIETSCH: No, it is less than that. In our current modelling, as you would be aware, Mr Chairman, all of the design progressively gets developed, and as we develop the design we have got a better understanding of the performance of the NSOOS. Sydney Water has prior to the EIS in 1997 modelled their system, but since that time they have been collecting a lot more information on the levels in their total sewer system, and that is the system from Blacktown, Hornsby, right through to North Head.

With all of that improved information, they have a much better view of how that sewer system performs under all sorts of rainfall conditions, so that they understand where the flows are, where the overflows are, what the quantity and what the times of those are, so early estimates were, as I said, 20 to 25 to 30 days. The current indication is that, on average, 15 to 20 days the tunnel may be in use.

CHAIR: This plan was published on 18 July 2000, so it is already out of date, is it, in the last two to three weeks?

Mr DIETSCH: I cannot make comment as to whether that should be viewed as a definitive document with respect to that.

CHAIR: What else can we trust if we cannot trust this?

Mr DIETSCH: I am not able to answer that question, Mr Chairman?

Mr WALKER: Mr Chairman, I do point out that all the figures that have been used are on the conservative side so that in all cases where there is uncertainty in the models, in the measurements, in the design, the conservative end figures have been used. That has been used in all forms of modelling and analysis relating to the tunnel and the vent. In this particular case, the subsequent work has provided a tighter figure, which is a lower figure and, therefore, a safer figure, if you like.

CHAIR: If you are being conservative, you surely, then, would measure the number of bacteria and viruses being emitted by the vent. That is not being conservative.

Mr DIETSCH: Mr Chairman, may I make a point of clarification?

CHAIR: Surely.

Mr DIETSCH: The 15 to 20 days that I was talking about is the 15 to 20 days at which the Scotts Creek facility is in operation with respect to venting. The 30 to 40 days is probably an appropriate one for the time at which the tunnel is in operation. The reason for that is that all of the time that the storage volume in the tunnel is less than 80 megalitres all of the air flow goes to North Head, in which case there is no reversal of the air flow and there is no initiation of the vent system at Scotts Creek.

The Hon. A. B. MANSON: That is the question that I wanted to ask, Mr Chairman.

CHAIR: It will certainly be breeding Legionella during the time that it is in there, though. Anyway on to the next question.

The Hon. A. B. MANSON: My question is specifically to Mr Dietsch. Can you explain to me how often the tunnel will actually exhaust vent at Scotts Creek? My main concern is the venting at Scotts Creek. That is the main concern of the residents out there. The tunnel is there. No-one is going to take the tunnel away, but the concern is the exhaust venting at Scotts Creek. Can you explain to me how many times that will actually vent per year?

Mr DIETSCH: Yes, the latest modelling indicates, as I said, that the Scotts Creek facility will be in use maybe 15 to 20 days in a year, but during that 15 to 20 days it is not necessarily venting during any or all of that time. That sort of number translates at the moment to somewhere between 350

to 400 hours per year, but of that time about 60 per cent of the time the tunnel levels will either be stationary or the tunnel will be pumping out, which means at that particular stage there will either be no exhaust or there will be suction of fresh air back into the tunnel so that the time that the actual vent, in terms of elapsed time, will be operating is currently estimated to be about 150 hours in an average year.

People will pick up on the term "average". The answer is there are wet years and there are dry years, so in a wet year it will be more than that and in a dry year it may be substantially less than that. Of that time that it is actually in use, only about two and a half per cent of the time will it be operating at the maximum rate that everybody knows and talks about, which is the eight cubic metres per second. The average vent rate when it is venting is about two cubic metres a second.

The Hon. JAN BURNSWOODS: Are you saying two and a half per cent of 150 hours?

Mr DIETSCH: No two and a half per cent of about 350 to 400 hours.

The Hon. JAN BURNSWOODS: It is still a fairly small percentage.

Mr DIETSCH: That is the time it would be operating at its maximum. Just from the point of view of the Committee's understanding, what happens is that as the tunnel is operated dilute sewage goes into the tunnel and flows to North Head. It is overflowing from perhaps four locations, which are Quakers Hat Bay, Tunks Park, Scotts Creek and Lane Cove, and when the total inflow rate exceeds the capacity of the pumps to pump out, then the volume progressively builds up, which is why it is called a storage tunnel. It is a temporary storage tunnel.

During that initial stage, then, essentially the tunnel ventilates to North Head so that the fresh air is being drawn in at Scotts Creek and Lane Cove and it is being passed out at North Head. When the tunnel fills its volume to approximately 80 megalitres, there is no air space to allow the air to be ventilated at North Head and both Lane Cove and Scotts Creek facilities are then initiated.

The air that is in the tunnel at that particular time is only the fresh air with some of the air that has been drawn from the sewer that has been drawn in in the previous time as the sewage has gone in. That air is then displaced as the volume builds up and, as we have said, there are only five to six times a year when that actually happens. So when that happens and the volume of storage in the tunnel builds, the air is displaced. Fans at Scotts Creek then pick up that particular air and push it out through the filter system, so there is a combination of louvres and fans at Scotts Creek which recognise by pressures whether the air has got to flow out of Scotts Creek or whether it is being drawn in.

The Hon. J. H. JOBLING: Mr Walker, I presume you are familiar with the Waterways Advisory Panel report of March 2000 in which the bulk of the panel's criticism of Sydney Water relates to its past dealings with the community and its secrecy relating to the Northside Storage Tunnel project. I presume you are well aware of the Scotts Creek community's major concerns about the failure to concrete line the tunnel and their fears of leachate through the sandstone walls. Noting those comments and criticisms, will you give this Committee an iron-clad guarantee that Sydney Water does not intend in the future to use the Northside Storage Tunnel for an operational conduit in the sewerage system?

Mr WALKER: I can guarantee that the tunnel is not there to replace the sewerage system in day-to-day use. Essentially, the main purposes of it have just been described in detail by Mr Dietsch. The other possible use of the tunnel which has been described throughout in the project proposal and approval documents as being in the event of a power failure which renders the North Head Treatment Plant inoperable, that it can be used to temporarily divert sewage from the sewer into the tunnel for the duration of the outage and then after the outage when the plant is in operation again, to process that sewage in the normal way through the treatment plant.

That will be for relatively short periods of time, given the reliability of the electricity supply system and its past history. We have had something like, I think it is five interruptions to the supply in the last 10 years, and the longest duration of those has been two hours.

What I cannot guarantee, if I can complete the answer, is that it is conceivable that under emergency conditions there may be a need in the overall interests of the community to divert sewage

from the trunk sewer, the Northern Suburbs Ocean Outfall System, into the tunnel. That is not a planned use. I am simply saying it cannot be ruled out categorically.

The Hon. J. H. JOBLING: To my knowledge there has been no assessment of the tunnel other than as a storage device. Am I correct, that you gave an assurance to the Waterways Advisory Panel that there was no intention to use the Northside Storage Tunnel as a permanent operating sewer as that would breach the EIS conditions of approval? Now, does that still stand or are you now hedging your bets?

Mr WALKER: No, it still stands. I am not hedging the bets at all. I just wanted to be clear about what that meant.

The Hon. J. F. RYAN: Would you agree with me, Mr Walker, that when you send your kids to school you exercise a certain level of trust about the environmental area where your school is?

Mr WALKER: I think that is a reasonable statement, yes.

The Hon. J. F. RYAN: In many respects it really boils down, to my mind, to a fundamental issue of trust, as far as the community is concerned, with Sydney Water. Do you think that Sydney Water has conducted its consultations up to this point in a manner which would make it conducive to the people of Scotts Creek to enjoy your trust?

Mr WALKER: Sydney Water has endeavoured to do exactly that, Mr Chairman. We have spared no expense, held back no information, and made everybody available who was conceivably of any use in the process. We have sought advice from any other body that we were referred to. We have endeavoured to be entirely open and honest in our communication.

It is a matter of some regret to us that we have not been entirely successful in that. We have achieved considerable success through community consultation on many aspects of this process. I did mention at the start that there were over 300 meetings or community consultation meetings relating to the tunnel at various locations and there are many examples where the community's preferences, their expressed concerns, have led to variations in design, have led to variations in the way the project has been conducted and variations in the way that the tunnel will be operated. Unfortunately, we have not been able to reach the same understanding with some of the community at Scotts Creek, and that is a matter of regret to us.

The Hon. J. F. RYAN: Would you agree that, quite apart from the fact that you have attempted to consult the community, on a couple of occasions Sydney Water has in fact not told the unvarnished truth to the community? I refer to the advertisements, the now infamous advertisements, that appeared in the *Manly Daily* with regard to the sludge pipe that, at the time that advertisement occurred, Sydney Water had no intention of inserting into the tunnel, did it?

Mr WALKER:. I cannot comment too much about the intention of whoever authorised that advertisement in 1997. I personally was not there. But Sydney Water did say in the advertisement that that facility would be provided by the tunnel and was in error. It has publicly admitted that was in error since and regrets that that was done.

That particular pipe was never an express inclusion in the tunnel design. It was not part of the environmental impact statement and not part of the original approval. It was regarded at that time when the design was done, when the environmental impact statement was prepared and when it was reviewed by the Waterways Advisory Panel in its first assessment of the project, as an option.

The Hon. J. F. RYAN: But you would agree that the New South Wales Legislative Council, the Committee that I chaired, and the Waterways Advisory Panel thought that that sludge pipe would be part of the project? It was part of the selling point on which the tunnel was marketed that one of the great advantages of the tunnel is that there would not be trucks rolling through Manly as a result of this sludge pipe being installed. It was an important feature in which the tunnel was sold to the community. It was not just an extra add on. It was an important marketing feature of the proposal in the first place.

Mr WALKER:. I have been told many times that was the expectation of some parties based on those advertisements that were made and, perhaps, other first-hand advice that was given to them, but I can only say that it was never a key theme of the marketing, as you put it, of the tunnel. It might have been an expectation of some. I have reviewed all of the early documentation on the tunnel. I have looked at all of the documents, including the glossy stuff that was prepared in the early days of the project, and it emphasised the matters that I emphasised in my opening statement, which are the considerable benefits to the environment and to public health that the tunnel project will bring.

The Hon. A. B. MANSON: Mr Walker—

The Hon. J. F. RYAN: I have not finished my questions.

The Hon. A. B. MANSON: You have asked four questions in a row.

CHAIR: Mr Manson, I decide who is to ask the questions.

The Hon. J. F. RYAN: I have a line of inquiry that I wish to pursue.

CHAIR: You will get the call in a minute, Mr Manson.

The Hon. J. F. RYAN: You can wait your turn before the Dorothy Dix questions get asked. Mr Walker, you have said that this tunnel will operate according to current operating philosophies. Can you understand that the community might regard that as a somewhat vague operating principle, that one day, just as the sludge pipe disappeared, just as the conduits were removed, just as the lining was removed, the community might believe that just one day the tunnel may not operate because some other circumstances change, some emergency has arisen and suddenly, what appeared to be a tunnel which was originally going to be a six-metre tunnel to which Scotts Creek was a minor connection, it is now a major part of the trunk line of the tunnel, with a vent pipe established in that community—never considered in the initial stages of this project? Can you understand the community might be a little concerned that guarantees given by Sydney Water one day can be changed the next?

Mr WALKER: Firstly, the operating conditions of the tunnel are subject to the approval conditions for the project and also licence conditions specifically relating to the vent that Sydney Water does not have the freedom to vary from those and to operate the tunnel in other forms. If there were some emergency which caused a rethink, that would be subject to approval. There would be a requirement to get the necessary health and environmental approvals and to consult with the community. If I can go back to the final part of the question that was asked of me—

The Hon. J. F. RYAN: Just take the tunnel at Tunks Park. You made a significant difference at Tunks Park as a result of the REF [Review of Environmental Factors] process—an environmental approval if ever there was one. It resulted in more ventilation being required at Lane Cove. The community there was concerned that, at the time the modifications were made at Tunks Park, no consideration was given to potential adverse health effects to people at Scotts Creek.

The Hon. JAN BURNSWOODS: What was the community at Lane Cove concerned about?

The Hon. J. F. RYAN: Sorry, not Lane Cove, Tunks Park.

Mr WALKER:. Firstly, there was the implication in the first question, I think, Mr Chairman, that the spur to Scotts Creek was not an original part of the project. Conceptually, when the project was first mooted, before there was any sort of design or community consultation, that was the case. It was going to go from Lane Cove to North Head, but very early on in the process in 1997, the additional arm of it to Scotts Creek was added in.

That was always part of the environmental impact statement. It was always part of the public consultation process. The necessity for a vent at Scotts Creek and at the Lane Cove end was always part of the design from 1997, from the environmental impact statement stage.

There were variations made later on in the tunnel because of, firstly, the information that was available through the design phase and then also the availability of the specialised tunnel boring machines, four of which had to be acquired on a world market.

Given the diameters of those machines that were available, it was a matter, then, of using them in the optimal way to deliver the best, overall benefits for the community in terms of reducing overflows to the harbour, which is the overall objective of the project.

That meant that there was a variation at that stage in the diameter of the Scotts Creek arm and in the Lane Cove arm and that was the subject of REF review of environmental factors which, again, were subject to community consultation. The detail of that was advertised, was available to the community and was open to public submissions. All of those were evaluated by the Department of Urban Affairs and Planning and they resulted in the approval that we are now operating under.

The Hon. J. F. RYAN: Do you say that—

The Hon. A. B. MANSON: Mr Chairman, can I get an answer from you? Mr Ryan came to the meeting late. He has asked seven questions in a row. Can I ask one question?

CHAIR: Finish this line of questioning.

The Hon. J. F. RYAN: Mr Walker, you said that—

The Hon. A. B. MANSON: Eight questions in a row.

The Hon. J. F. RYAN: There will be plenty more. I am speaking on behalf of the Opposition, Mr Manson. Do not be ridiculous.

The Hon. A. B. MANSON: I know you are a future leader.

CHAIR: Let us not waste time.

The Hon. J. F. RYAN: You said that since 1997 the potential exhausting of Scotts Creek has been part of the project?

Mr WALKER: Yes.

The Hon. J. F. RYAN: Why was it, then, that in the 1997 EIS there was no hazard analysis detailed in Appendix O giving exhaust volumes for Scotts Creek?

Mr WALKER: Off the top of my head I cannot comment on Appendix O of that hazard analysis. What I can say, though, is that the environmental impact statement was approved in December 1997 and Willoughby Council specifically commented in its submission on the vent at Scotts Creek.

The Hon. J. F. RYAN: I have some other questions, Mr Chairman, but if Mr Manson wishes to ask one, now is appropriate.

The Hon. A. B. MANSON: Could you advise whether there are any additional environmental benefits resulting from a review from the final tunnel design?

Mr DIETSCH: In addition to the captures of the overflows which occur at Scotts Creek, Lane Cove, Quakers Hat Bay and Tunks Park, for which the original EIS was targeting 80 to 90 per cent of the overflows, the most recent modelling indicates that they are going to be achieved. Then in addition to that, the operation of the tunnel will in fact provide benefits at other overflows which are not currently part of the tunnel structure, and they are things like Davidson Park and Sailors Bay and Tarban Creek.

At this stage, the overflows at those locations both in terms of volume and in terms of numbers of overflows also look like they are going to be 80 to 90 per cent lower than they currently would be without the tunnel

(Short Adjournment)

CHAIR: In Sydney Water's submission there are discussed 11 options which are negotiated with the community. Are you aware of this?

Mr WALKER: These are the options for the vent location?

CHAIR: Yes, this is for the local site alterations and low separation, high separation, and so on. There are a total of 11 alternatives. It would appear that the one chosen is the one least favoured by the community. There are a couple here which I would like to explore with you over the next few minutes, and it has to be very brief, unfortunately. One of them is the 1C option, which is the Scotts Creek facility as proposed plus 15-metre stack at current site with HEPA [high-efficiency particle-arrestor] filter. Now, that filter was I think going to be put in originally. Can you tell me why that was dropped?

Mr QUILL: I presume you are referring to the HEPA filter?

CHAIR: In your submission, yes.

Mr QUILL: That was an option that we discussed with the Scotts Creek community during mediation. We are still having ongoing discussions with the Department of Health about the merits of such a filter. Now, when we talk about hospital grade, it does not necessarily mean that it is the same sort of filter that is actually typically installed in an operating theatre but it still has, as I understand it, relatively high operating efficiency.

CHAIR: Would that remove Legionella?

Mr QUILL: I might need to refer to something.

Mr WALKER: We understand, Mr Chairman, that it removes some aerosols and the key issue, of course, with Legionella is that the manner in which Legionella would be conveyed from the tunnel, if it gets there at all, would be by aerosols.

CHAIR: Can I go one step further to number 2C, which is the exhaust line in tunnel roof from Tunks Park to North Head Sewage Treatment Plant scrubber?

Mr WALKER: Yes.

CHAIR: The other day I think, Mr Walker, you made the suggestion that the cost of putting in one of the air vents from North Head to Scotts Creek was less than $30 million. Did you quote $16 million?

Mr WALKER: In the estimates committee hearing, Mr Chairman, I think the question was whether $16 million was of the right order of magnitude. At the time under those conditions I had in my head a figure of $20 million-odd and I said, yes, it was of that order of magnitude. That was, in fact, in error, because I do not think $16 million is of the order of magnitude of the figures that we are talking about here, which are correct.

CHAIR: When Tunks Park was sealed off, is it not a fact that there was a reduction in the capacity of the tunnel of some megalitres. Can you tell me how many megalitres of reduction there were?

Mr DIETSCH: I do not know that number off the top of my head. It was a relatively small number.

CHAIR: Maybe four or five megalitres, do you think?

Mr DIETSCH: It would be less than that. It would be in that order of magnitude.

CHAIR: There is some concern about the pressure that builds up there when the tunnel is filled and the air pressure builds up. Is there any possibility of explosion or burst when the air pressure builds up at Tunks Park?

Mr DIETSCH: Mr Chairman, no.

CHAIR: Can you tell me, then, if there were an air vent—for example, using option 2C—taken from Tunks Park to North Head, how many times a year would there be venting at Scotts Creek and Lane Cove? It is page 57 of the submission.

Mr QUILL: Could you repeat that? I am not sure that we understand the question, Mr Chairman.

CHAIR: Under option 2C, if there were an exhaust line placed in the tunnel roof to vent the air, as the tunnel fills, the venting would continue, as I understand it, until the tunnel is 80 per cent full. That would then reduce venting at Scotts Creek by, presumably, 80 per cent or more. Have you done any modelling on how many times there would be air venting at Scotts Creek if there were placed an exhaust line in the tunnel roof from Tunks Park to North Head?

Mr WALKER: The reason for our confusion, Mr Chairman, is that the basic principle of option 2C is to avoid venting at Scotts Creek by conveying the vented air to North Head.

CHAIR: Yes, but there would still be venting at Scotts Creek, I think you will find, two, three or four times a year unless it completely avoids venting at Scotts Creek.

Mr WALKER: That was the purpose of doing it.

CHAIR: Not necessarily. The option only works in the tunnel up to 80 per cent. Beyond that, the air is exhausted at Scotts Creek and Lane Cove. These are comments in the actual submission you have just given to us. Read the submission. Open it up at page 57.

Mr WALKER: I see where you are reading from, Mr Chairman. You have me personally at a loss. I am looking for advice now. We are happy to take that question on notice, Mr Chairman. We do not have an answer available for you right here on that one.

CHAIR: It is a really important question. Perhaps you can have the answer to that question here by tomorrow if that is okay. Basically, what we are saying is that if you were to build an exhaust pipe you would be able to use the capacity which you cannot use now in Tunks Park, there would be no pressure build-up and the venting at Scotts Creek would be reduced from maybe 20 to 30 days a year to maybe two or three days a year or less. So would you like to explore that possibility and get a proper costing, perhaps also by tomorrow, on that actual exhaust line on option 2C?

Mr WALKER: I think we have answered that question earlier today, and we stand by those costings.

Mr HENDERSON: I think I can answer that question. If you look at 2C, it is talking about an exhaust line from Tunks Park.

CHAIR: Yes, Tunks Park. I know that?

Mr HENDERSON: We were under the impression that you meant Scotts Creek.

CHAIR: No, I was always referring to 2C.

Mr HENDERSON: Okay.

CHAIR: That is Tunks Park.

Mr HENDERSON: The reason there is that once the level reaches the roof at Tunks Park and submerges that pipeline, then the remainder of the air in the tunnel to Scotts Creek and Lane Cove—

CHAIR: Yes, I understand that?

Mr HENDERSON: —would be vented. We were confused about what you meant.

CHAIR: I am sorry. Maybe I used the wrong word. But, basically, so many times a year the tunnel will be 50 per cent full or 70 per cent full or 80 per cent full or beyond, so if it is beyond 80 per cent it will then vent to Scotts Creek and Lane Cove?

Mr HENDERSON: Yes.

CHAIR: How many times a year and how much air will be vented at Scotts Creek and Lane Cove when it reaches 80 per cent full when the pipe is flooded at Tunks Park?

Mr HENDERSON: We have not specifically modelled that situation, Mr Chairman. We cannot give you a definite answer at this point on that.

The Hon. J. F. RYAN: It would be fair to say that under those circumstances venting at Scotts Creek would then only be—one is not exactly sure what the exact term—reasonably fresh sewage. It would be 80 per cent full, so it would probably be during the duration of a storm event. If it were possible to eliminate venting at Scotts Creek in all but for the duration of an actual storm event and perhaps immediately afterwards, that would probably represent a fairly significant improvement in the health risks taken at that point, would it not?

Mr WALKER: Mr Chairman, it is still $26 million, the figure which is included in our submission on option 2C. It is on page 27 of our submission. The point is, in any case, that the Scotts Creek vent will only come into operation under the very sorts of conditions that Mr Ryan describes, which is when you do have a major storm event and when the inflow to the tunnel is very diluted—that is, diluted with rainwater, sewage—so it is only those conditions, anyway, which constitute the five or six days a year or the couple of occurrences a year where you are going to get that.

CHAIR: Five or six events?

Mr WALKER: Five or six events, I am sorry.

CHAIR: But the volume of air being vented when the tunnel is 50 per cent full is vastly greater than the quantity of air vented when the tunnel is 80 per cent full. That goes without saying.

Mr DIETSCH: Mr Chairman, the rate at which the vents operate is a function of the rate at which the overflows are flowing into the tunnel and it really has nothing to do with the level in the tunnel at the time. Mr Ryan commented about the vent only operating during the storm and not after the storm is finished.

The overflows taper relatively quickly after the storms have gone. In fact, I made the point earlier that while for a period of time Scotts Creek is active, when the storm has dissipated the tunnel is essentially pumping out and at that stage fresh air is being drawn into the tunnel and there is no venting at Scotts Creek. So at the tail end, once the storm goes and the levels in the sewer start to drop, fresh air is being drawn into the tunnel, so, essentially, venting does stop.

The Hon. J. F. RYAN: The 1997 EIS indicated that the volume of sewage overflowing in Scotts Creek was some 528 million litres. Then Sydney Water published something called a time series model in mid-1997, which projected that this would double to more than 1.134 million litres. The latest Scotts Creek information sheet, I understand, that was published by Sydney Water in July 2000 states:

> The latest modelling shows that at Scotts Creek on average nearly 2 billion litres of diluted raw sewage flows into local waterways.

That represents the second time on which the figures have doubled. Why over the last three years have Sydney Water's projections for Scotts Creek's annual sewage overflow increased now by a factor of four?

Mr WALKER: Mr Dietsch could answer that question, Mr Chairman.

Mr DIETSCH: Mr Chairman, I cannot go to the information that might have been provided before in early 1997. That is outside my knowledge. The confusion between the numbers as you see them may be as a result of the fact that there are two overflows at Scotts Creek not very far apart.

The current proposal to capture the overflows at this new Scotts Creek facility in fact influences both of those overflows—that is, the main overflow and the submain overflow—and between those two at the moment the current modelling information or the actual measurements indicate that there is about the number that you said, about 1.9. The earlier numbers probably only refer to the primary overflow which was identified originally.

The Hon. J. F. RYAN: Could you provide the Committee with some more information on that because you can understand that some of the community at Scotts Creek believe that there appears to be no end to this increase in overflows? You can understand that they have been told that 75 per cent of the overflows are captured into the tunnel and, at the current rate, 75 per cent of 2 billion represents nearly the same amount of sewage going into Scotts Creek as previously happened with or without the tunnel.

If there is something occurring that is causing that overflow to increase—for example, it could be additional connections in the western suburbs, and so on, then the community are concerned that it could well be that at a time in the future the environmental benefit of the tunnel at Scotts Creek will be no different than currently pertains at Scotts Creek now but in addition to that they will have a vent.

Mr WALKER: While my colleague is preparing an answer on this specific point, Mr Chairman, perhaps I could make the point that the growth issues have been taken into account in Sydney Water's work. There has been work done on the urban growth. We have had a look at the industrial and commercial potential and it is quite clear that the benefits will be delivered and they will be delivered in accordance with the proposal. They will not be rapidly eroded in the way that Mr Ryan implies.

The Hon. J. F. RYAN: You can understand that the community reading figures in that fashion might come to that conclusion?

Mr WALKER: On the figures.

The Hon. J. F. RYAN: And it is your responsibility.

Mr WALKER: To explain the figures. My colleagues are consulting figures at the moment.

Mr DIETSCH: Mr Chairman, the numbers that we currently have with respect to overflows are not projections. They are neither current numbers or future projections; they are essentially the measured overflows based on the information that is available and the modelling of the period from 1985 to 1994 which formed the basis for the EIS.

As I said, it is probably the fact that some of the early figures that may have been quoted by people would have focused only on the primary overflow at Scotts Creek, and the amount of overflow being quoted is what is actually flowing into Scotts Creek, not what might be projected in the future. So this is not a hypothetical; this is just a statement of what has been assessed to be the overflow during that particular period.

At this stage, the operation of the tunnel is still anticipated to achieve better than the original EIS aims, which were 80 to 90 per cent of overflow. At this stage, in an average year it is anticipated that the number of overflow events in the area will be between 85 and 90 per cent reduction and the volume reduction will be of a similar level.

The Hon. J. F. RYAN: The tunnel has always had an objective to be completed in time for the year 2000 Olympics. Has that affected any of the decisions made at Scotts Creek with regard to the ventilation system that might have affected the cost, for example, of alternatives or the time involved? Can you assure the community that they have not been given the rough end of the decisions that needed to be made?

Mr WALKER: I think the amount of time spent by Sydney Water in researching, analysing and costing all of these different options demonstrates that all options have been considered seriously and Sydney Water has not swept aside the community interest in some reckless pursuit of this objective. It is a very real objective. It was clearly established for the project in the early days of the project and we have been working with some determination to try to achieve it. As I say, we have not had that foremost in our mind and ignored the other important issues.

The Hon. J. F. RYAN: It would be fair to say that if one of those other solutions that you have outlined in your submission was possible for Scotts Creek in preference to the ultimate solution, but that it would have meant that the tunnel could not be delivered by September 2000, it would be fair to say that that would not have been pursued?

Mr WALKER: I do not know that we could say that. The key element of our argument is simply that we have considered all of the options. We have taken account of the risks, especially as evaluated by the Department of Health in relation to community health. When you take account of an assessment which says that there is effectively negligible risk from the vent operation, we could simply not justify the tens of millions of dollars which is involved in other solutions.

I know that point has been made by some members of the community that what is $20 million or $30 million in a $450 million project, but I can assure you that there are plenty of other projects for the benefit of the environment and public health on which we could spend those funds. We are obliged to take account of all these sorts of factors in making this judgment.

The Hon. J. F. RYAN: You can understand that the environmental conditions at Scotts Creek might be a fairly significant impact on the decision some parents might make as to whether they send their kids in the future or continue to send their kids to the Glenaeon School. Would you say that would be fair?

Mr WALKER: What I can say is that the assessment that we have made based on the expert advice and that from the Department of Health in particular is that the overall impact of this project and including the vent is positive in terms of public health and including the health of the immediate community and the Glenaeon School. By elimination of the frequency of open overflows there, and even taking into account the risks, if there are any, but very minor risks associated with the vent, there is a clear, unequivocal public health benefit. The school has been living closely alongside this overflow point for, I think it is in the order of 40 years, certainly in excess of 30 years.

The Hon. J. F. RYAN: What if the school is able to demonstrate in two year's time that the number of people sending their kids to their school deteriorates to such a point that the school becomes no longer viable? There could be only one explanation for why that might have occurred. It would be because you people built a vent 40 metres away from the school. Are you prepared to consider indemnifying the school in any way?

It has to be accepted that the manner in which Sydney Water has conducted itself in consultations has resulted in this mistrust and some of it might be public perception, but are you prepared to indemnify in any way the school's continued operation if, as a result of constructing that tunnel, the school's population deteriorates to a point that it is no longer viable to continue the school?

Mr WALKER: Are you suggesting that we trade off kids' health—

The Hon. J. F. RYAN: No, not at all.

Mr WALKER: That is what it sounds like to me.

The Hon. J. F. RYAN: In essence, the school is a business. If you ruin the business of the school by putting a tunnel over the other side, do you think you have any responsibility at all towards assisting the school to relocate or change or communicate with its community so that it is somehow restored?

Mr WALKER: We cannot indemnify people's health. There are so many factors that are beyond our control. It is clearly unrealistic to do anything of that kind. We would be concerned if all of this fear and apprehension generated around this project has caused problems for the school. Obviously we are. I was asked some time ago, this was after the mediation process, if I would meet a delegation from the school, including the school principal. I did so, with the intention of satisfying myself from a personal point of view that there were not some other facts, there was not some other information that could be laid on the table which would cause me to reassess, to ask for a further review, to ask people to have a second look at things. But there was not.

CHAIR: Yet.

Mr WALKER: Well, every opportunity has been given to the community to bring forward their concerns, to put them on the table, and we have tried with all endeavours to address those and to resolve their fear and apprehension.

CHAIR: It has not been resolved, has it?

Mr WALKER: Not entirely, I agree.

The Hon. J. F. RYAN: When out on the site, our attention was drawn to a green vent located close to the school that is venting the existing sewer. It would be fair to say that there is no comparison between that green vent and the other operation proposed for the new ventilation in terms of the volume of air and the area of sewer that is going to be vented from the new works at Scotts Creek, is there?

Mr WALKER: Perhaps I could refer that question predominantly to Mr Dietsch.

Mr DIETSCH: Mr Chairman, there has been a lot of focus on the maximum vent rate at Scotts Creek, and I said earlier that the current modelling indicates that that is about two and a half per cent of the time that that facility itself is active. The interesting thing, and this is fairly well agreed between the community and Sydney Water, is that the volume in an average year sounds a large number—it is 800,000 cubic metres. That is about the same amount of air that is vented out of one green vent such as the type at Scotts Creek. It is also equal to the amount of air that one bathroom fan actually passes in one year. It is the fact that it is a high flow rate for a very short period of time that makes people think that it is an enormous amount, but in terms of annual rates it is the same as a green vent.

CHAIR: Which hangs there in the inversion, so you would have to breathe the air for several days, not just for one day.

Mr DIETSCH: That is a modelling issue for which substantial modelling has been done to look at dispersion rates and look at the concentration of reduction. We are satisfied that the reductions in concentration is quite substantial at any point that vent materials reach. I am sure that will be asked of the air quality experts in the later sessions.

The Hon. J. H. JOBLING: Mr Henderson, did I understand you correctly, that you were taking single emissions from the new vents on a single happening and then attempting to correlate them to the average emissions over a whole year's basis and say they are the same?

Mr HENDERSON: In quantity terms, that is correct.

The Hon. J. H. JOBLING: In quality terms that is correct, but in effect of happening at the time, it is radically different, is it not?

Mr DIETSCH: Yes.

The Hon. J. H. JOBLING: So, how can you then attempt to make any correlation between these two? They are two totally different issues.

Mr DIETSCH: I was responding to the question which was how can you relate one green vent to the vent at Scotts Creek and the answer is that they both emit the same volume in a year. That is, in fact, a correlation and the green vent is unfiltered.

The Hon. J. F. RYAN: The health issues between the two vents would be radically different, would they not?

Mr DIETSCH: Yes, the green vent comes from an ordinary sewer and is unfiltered and the Scotts Creek vent goes through a filter system from essentially a dilute sewage and fresh air mix.

The Hon. J. F. RYAN: So, what, there is no need to filter the air coming out of Scotts Creek, the new works at Scotts Creek because, frankly, it is the same as the stink pipe next to the school, is it? Why are you going to all the expense to do that?

Mr WALKER: I do not want to return to the detail of filtering too much, but the perception issues which have been raised, and we have spoken of recently, it is interesting to note that the letter from New South Wales Health Director-General, Mr Reid, to you, puts this perception issue in some perspective, I believe. He says:

> The development of sewage systems, however, is often not without controversy. The construction of Sydney's sewerage system in the late nineteenth and early twentieth century caused considerable public furore and a report from Sydney Water to the New South Wales Parliament in 1894 specifically dealt with community concerns that the 20,000 vents ultimately required for the system would cause public health problems by the spread of disease. One hundred on, there is no evidence that this existing system of vents has ever caused a public health problem. On the contrary, the sewerage system that the vents support has enabled the community to shift away from an era of infectious disease.

I think that puts the issue in some perspective.

CHAIR: It does not, really. There has been a huge increase in child asthma and we do not know where that comes from and we do not know whether you can relate the number of people falling sick to 20,000 vents. There has been no research done. The EPA does not even monitor it.

The Hon. J. F. RYAN: If the green vents outside the school are no different than the new ventilation works to the Northside Storage Tunnel, in terms of health risks, why then are you going to the trouble of filtering it to 99 per cent to take hydrogen sulphide and other things from it?

Mr WALKER: Indeed, this is a very good point.

The Hon. J. F. RYAN: Why not vent it to the air?

Mr WALKER: The advice is that, on purely design grounds, the filtering is not necessary, and the point was made earlier by Mr Henderson that there are similar tunnels around the world that do have unfiltered vents. In this particular case, every effort has been made to follow the precautionary principle that was talked about before and to take every possible step to protect against these risks.

That is the reason for installing the filter. The filter creates substantial but reasonable additional cost in the context of the project and, therefore, has been put in place, has been implemented. Now, we believe that that has been a responsible approach to the design and of bringing forward this project.

The Hon. JAN BURNSWOODS: Just for the benefit of lay people here, what actually is the composition of sewer gas?

Mr WALKER: It is stated in our submission. I must admit, my study of chemistry is about 30 years old, but it is a mixture of gases which derive from organic material which is predominantly hydrogen sulphide and some other sulphides and the like and also some of the more commonly occurring gases like nitrogen and so forth. But it is covered in the report.

The Hon. JAN BURNSWOODS: So it is around.

Mr WALKER: In fact, the point is also made that the air which we are talking about dispelling from the tunnel, because of the fact that it is at other times a properly ventilated tunnel and is rapidly filled by very dilute sewage will actually be about 90 per cent air and about 10 per cent sewage gas, so whereas it is sewage gas that is vented from the 20,000 vents around Sydney, it is a very much diluted gas or mixture that is vented from this particular vent at Scotts Creek.

The Hon. J. H. JOBLING: But in massive volumes.

Mr WALKER: In massive volumes. I take the point,.

The Hon. J. F. RYAN: But at the one time.

Mr WALKER: But in a short time.

The Hon. J. R. JOHNSON: My question is to Peter Fisher. Could you provide further information on the dilute sewage that may enter the tunnel and your assessment of the likelihood of generation of significant quantities of noxious or hazardous gases?

Mr FISHER: As has been said, the Northside Storage Tunnel has specifically been designed to capture dilute sewage in wet weather and reduce the overflow into the harbour from four points on the Northern Suburbs Ocean Outfall System. In wet weather, stormwater can enter Sydney Water sewers all over the place. It enters through things such as cracks in the pipe, poorly sealed access chambers, from faulty private sewers that connect each and every one of our houses.

The Hon. J. H. JOBLING: And illegal connections.

Mr FISHER: And through illegal connections. In wet weather that volume of stormwater that gets into our system severely swells up the volume of sewage, and that results in the overflows occurring. In wet weather, that rainfall that gets in significantly dilutes the chemical composition of sewage.

As part of the licensing sewage overflow EISs that went on public display in mid-1998, those EISs outlined the results of an ecological and human health risk assessment that was carried out on sewage overflows. Eleven sewage overflow points were assessed, and four of those points were actually on the Northern Suburbs Ocean Outfall System. Three of them were in fact common to the overflow points that the tunnel intercepts, and the three that were common were Lane Cove, Quakers Hat Bay and Tunks Park.

The results of that assessment indicated that depending on the chemical constituent of sewage concerned, in wet weather the wet weather dilutions could be over one-tenth the concentration in dry weather. It varies considerably from parameter to parameter, but it gives an indication of the volume of, essentially, rainwater that gets in in wet weather and that dilutes our sewage.

When the sewage starts overflowing, as it would be overflowing and captured by the Northside Storage Tunnel, it goes down drop shafts, so the sewage, again, collects a lot of air as it goes into the tunnel, which further freshens the sewage, so we have got a lot of rainwater in there and we have the sewage being freshened up as it drops into the tunnel. That will help keep the sewage fresh while it is stored and flowing back to the North Head treatment plant.

In terms of the second part of the question, Sydney Water's trade waste policy is arguably one of the most stringent in Australia. That has resulted in a significant reduction in the amount of industrial and commercial waste discharged to our sewerage.

Industry and commercial areas are cleaning up their effluent to domestic quality, and this means that the amount of toxic chemicals and other nasties, if you like, being discharged into the sewer has dramatically reduced over the last number of years, so we have got a much cleaner raw sewage to start with.

In wet weather, the dilution means that any dilute sewage that is in the tunnel is unlikely to be generating any other nasties while it is in there. Indeed, no mechanism has been suggested, nor is it considered likely, for chemicals to be created by any reaction while the dilute sewage is stored in the tunnel.

I might add that the Northside Storage Tunnel EIS in, I think, Appendix D indicated a whole lot of chemicals and volatile organic compounds [VOCs] that were assessed as having absolutely a negligible risk so far as the operation of the tunnel is concerned.

CHAIR: You would also be aware of the comment about Legionella in the Department of Health's submission which you quoted just now. They say:

> Thus the vast majority of pathogenic microorganisms in sewage are not transmissible through aerosolisation. An exception to this may be Legionella SP, which is present in small levels in sewage.

And so on and so on. So you are aware, then, that even the Department of Health has cautioned somewhat, so if the HEPA filtration went in the tunnel, would that pick up Legionella and any other aerosols and PM2.5s and below? If you do not have that information today, can you find it by tomorrow?

Mr WALKER: We will take that on notice, thank you, Mr Chairman. I might also point out, Mr Chairman, that the et cetera et cetera, which you have left out of that quote—

CHAIR: Everyone has this so they can read it themselves, if they wish.

Mr WALKER: Well, it was the bit that goes on to make the point that conditions in sewage are, however, not conducive for Legionella proliferation.

CHAIR: But others argue with that, you see.

Mr WALKER: Nevertheless, I make the point that we rely on the expert assessment of the overall condition by the New South Wales Department of Health.

CHAIR: We will be having experts in Legionella before us, and no doubt they will be able to give evidence as to whether they agree with the Department of Health submission. Thank you very much for coming today.

(The witnesses withdrew)

WENDY JOY NORTON, Public Servant, 43 Headland Road, Castle Cove, sworn and examined:

ROSEMARY HELEN GENTLE, Schoolteacher, Glenaeon Rudolf Steiner School, 5A Glenroy Avenue, Middle Cove, sworn and examined:

BRIAN PATRICK MORAN, Social Ecologist, 21 Cheyne Walk, Castlecrag, affirmed and examined:

TREVOR MARC LEE, Design Engineer, 1 North Arm Road, Middle Cove, affirmed and examined:

HELEN FRANCES SCARD, Full-time Mother and Part-time Massage Therapist, 38 Coolabah Crescent, Forestville, sworn and examined:

LOUISE MARGARET MITCHELL, Housewife, 173 Edinburgh Road, Castlecrag, sworn and examined:

KENNETH NORMAN RUTHERFORD, Consulting Engineer, 189 Deepwater Road, Castle Cove, sworn and examined:

JUNE HELEN CUNNINGHAM, Management Consultant, 27 Central Road, Avalon, affirmed and examined:

CHAIR: Ms Norton, in what capacity are you appearing before the Committee?

Ms NORTON: As a representative of the Scotts Creek Community Liaison Committee.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms NORTON: Yes, I have.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms NORTON: Yes, I am.

CHAIR: Ms Gentle, in what capacity are you appearing before the Committee?

Ms GENTLE: As a member of staff and as a director of Glenaeon Rudolf Steiner School.

CHAIR: Ms Gentle, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms GENTLE: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms GENTLE: I am

CHAIR: Mr Moran, in what capacity are you appearing before the Committee?

Mr MORAN: I am President of the Parents Association of Glenaeon Rudolf Steiner School.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr MORAN: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr MORAN: I am.

CHAIR: Mr Lee, in what capacity are you appearing before the Committee?

Mr LEE: Engineering adviser to mediation and the technical subcommittee, a committee member of the Parents Association of Glenaeon Rudolf Steiner School and as a parent of three children who do or will go to Glenaeon and a resident 250 metres from the vent. That is a mouthful, but that is it.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr LEE: I certainly did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr LEE: Yes.

CHAIR: Ms Mitchell, in what capacity are you appearing before the Committee?

Ms MITCHELL: Secretary for Willoughby Environmental Protection Association, WEPA, and I have been on the Scotts Creek CLC [Community Liaison Committee].

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms MITCHELL: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms MITCHELL: Yes.

CHAIR: Ms Scard, in what capacity are you appearing before the Committee?

Ms SCARD: I am a parent of two daughters at Glenaeon School.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms SCARD: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms SCARD: Yes, I am.

CHAIR: Mr Rutherford, in what capacity are you appearing before the Committee?

Mr RUTHERFORD: Secretary of the Castle Cove Progress Association.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr RUTHERFORD: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr RUTHERFORD: Yes.

CHAIR: Ms Cunningham, in what capacity are you appearing before the Committee.

Ms CUNNINGHAM: I am a parent of a child at Glenaeon School, a member of the Scotts Creek CLC and a representative of the school on the mediation process.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms CUNNINGHAM: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms CUNNINGHAM: I am.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. I believe you have an opening statement or statements to make.

Mr MORAN: Rather than make one overarching statement, five members of the community would like to make individual statements, if that is okay.

CHAIR: Please go ahead.

Ms NORTON: Thank you for allowing us to be here. Before I read my prepared statement, I cannot not reply to some of the comments that were made in the previous session. I found Mr Walker's very equivocal response to the question on the possible future extension of use of the tunnel for further use of raw sewage very disturbing. His answer implied that, "Well, we cannot change it until the regulations are changed" which gives me no comfort whatsoever, given that the plan was changed markedly and it had an immense effect on our community when the Alliance removed the vent at Tunks Park. We knew nothing about that, so I have absolutely no faith in the idea that this tunnel will not be used for something else in the future if someone else decides it is better for them.

Another point that I would like to make is the answer to the question about whether the time line of the Olympics was something that was a big factor in our negotiations. I cannot tell you how many times we were told, "We cannot do anything; we have got the Olympic deadline." It horrifies me that the answer slid away from that. We were told that from the beginning. We were told it in the CLC meetings and we were told it in mediation.

Finally, that brings me to Mr Henderson's unequivocal answer as well, when he talked about all the reasons that we could not possibly have a return air pipe to Manly because it would add to the time and slow down the project. There is nothing whatsoever to stop this return air pipe being retrofitted. It can be put in. In our submission, and I am sure you have read it, we gave examples of how the tunnel can be used in an interim way while the air pipe is being retrofitted. So I really feel that those points had to be made before I read my prepared statement, and now I will, if I may.

The Scotts Creek community has, for many years, urged Sydney Water to do something to eliminate the disgusting pollution of the harbour by its sewage overflows at Scotts Creek. Thus, when the Northside Storage Tunnel was proposed, we thought our prayers had been answered. But we soon discovered that the proposed solution to the overflows was a bigger and potentially more dangerous problem than the overflows themselves.

This is because the design of the Northside Storage Tunnel has changed so much from the 1997 exhibited proposal that the community initially supported. We are now faced with air pollution as well as harbour pollution. Scotts Creek will still be subject to sewage overflows and we now get massive air pollution as well. So, it is a double whammy for the Scotts Creek community.

Our concerns relate to the immense volumes of sewage gas which will be pumped into the Scotts Creek valley within 80 metres of Glenaeon School and 100 metres of residences in Middle Cove and Castle Cove. This, surely, would be the very last place that a prudent planner would choose to fan force enormous volumes of sewage gases.

The vent is at the base of a natural amphitheatre, a valley with steep sides noted for its inversion layers, where the prevailing wind conditions are frequently of zephyr-like velocity and clouds often blanket the valley for hours, particularly during inclement weather.

When the EIS for the tunnel was exhibited, there was no suggestion that this site was to bear the brunt of such enormous volumes of sewage fumes. It has been chosen for reasons of expediency with a cavalier lack of consideration of the well-being of the Scotts Creek community. We just happen to be at the end of the line.

Matters which have been of grave concern to us and are still not satisfactorily resolved include the lack of application of the precautionary principle to the venting at Scotts Creek. It is apparent that the notion of possible health effects of the venting was not considered by the Alliance until they were raised by CLC members. Also, absence of evidence that the vent will be safe. There has been a steadfast refusal to address our concerns regarding health.

These issues were first raised by the CLC in 1998 and the responses to our questions have consisted of bald assertions which show no evidence of genuine consideration of the matters we have raised. Reports by experts commissioned by the community have been treated as dirt before the broom.

Another concern is the fact that odour-control measures have been used as diversions whenever air quality is raised by community members. This was still occurring as recently as the last stakeholder meeting regarding the operation of the tunnel in May this year. Of course, we are anxious that the vent does not produce smelly gases. Actually, we are even more anxious, now that our latest advice is that the levels of hydrogen sulphide are unlikely to be controlled by the carbon filters proposed for the vent, but we are particularly concerned about the myriad of pathogens that will be released into the air around the vent and which may result in illness.

Our concerns include the likely increase of minor illnesses in our community, as well as more serious or significant illnesses. Our concerns have increased as Sydney Water, the Alliance and various government departments have weaved and ducked as we asked questions and refused our request for answers.

Who will take responsibility for our community's health? We are appalled by the attempt to liken the Scotts Creek vent to the ubiquitous green vents so common to sewerage lines. What a furphy. The green vents are closely spaced along sewers and emit small quantities of gases. Our vent is going to pump vast quantities into the lungs of residents and developing children whenever the tunnel fills past the 15 per cent mark.

The emissions from the filling tunnel will be concentrated in two spots—Scotts Creek and Boronia Park—with the majority of fumes leaving via Scotts Creek. We are also appalled by the attempts to liken the Northside Storage Tunnel to overseas tunnels like the ones in Rochester and Chicago in the United States. These tunnels have vents dotted along their lengths, about one per kilometre. In fact, the tunnel that Mr Henderson spoke about earlier is 30 miles long and has 48 drop shafts.

They are also lined with concrete, a feature removed from the Northside Storage Tunnel subsequent to the EIS, and they are flushed with river water. It is outrageous to compare them with the poorly designed, on-the-run Northside Storage Tunnel.

The community is outraged at the way the community consultation process has been manipulated in this matter. The divide and conquer approach to the communities involved will serve as a textbook example of how to circumvent the true intent of the conditions imposed on a project.

There must be times when Parliamentarians feel frustrated at the limited prospects for overriding the power of the bureaucracy. The Committee system of this honourable House now presents the opportunity for honourable members who are well informed about an issue and who care about that issue to encourage the Government to correct a very bad mistake.

This is an opportunity for honourable members to make a stand which will be a source of pride for the future, a principled stand of which we will be reminded daily by every healthy child whose well-being might otherwise have been gravely threatened by poisonous fallout.

We are very relieved that this Committee has decided to examine this issue and are sure that, when all evidence has been examined by the Committee, you will agree with us that there must be no venting of the Northside Storage Tunnel at Scotts Creek.

Mr MORAN: I would like to go next if I may. Just a bit more background. I am actually a management consultant, professional social ecologist, and I have worked in the area of social auditing and community consultation, so I came to this process as a parent, as a consumer of Sydney Water's product and also with a professional interest in how the whole process of community consultation was conducted. So my remarks are related specifically to the area of mediation, community consultation and the precautionary principle which I will come to later.

I guess after this morning's remarks, what goes to the core of our concerns at Glenaeon School is the whole question of faith and trust in this process. For about a year and a half at the beginning of the process, we actually had a great deal of faith. We entered into the process through the Community Liaison Committee structure in good faith and participated willingly in that. We have four members of the school community who are active participants in the CLC process.

After about a year and a half, our concerns were starting to grow about deception and frustration with the process. We saw originally that process as being in place to protect the interests of the parents and children and from all the published data from the Alliance building the tunnel, from the EIS forward, we had a degree of faith and comfort that the interests of the school, parents and the children would be satisfied by that process.

It was only when the school council were advised by their representatives to the CLC process that they were afraid that their concerns were not being heard and that the process was a corrupt one, that Rosemary and I had a conversation about whether or not the parents should be better informed because we believed up to that point that our interests would be served from that process.

In May of last year when our concerns were heightened and it became clear that that process was not going to protect their interests, we then decided that we needed to do something different and, if you like, to take more action.

We sought meetings with the Minister and the Minister for Urban Affairs and Planning and put our concerns to both gentlemen. Through the process of negotiation we asked that we enter into a mediation process so that we could get to the bottom of what we saw as a process of consultation that had irretrievably broken down. So we entered into the mediation process with some relief and some enthusiasm.

As a process consultant myself, I was keen to participate, because having designed and having participated in a number of such studies I was interested to see how that process was carried out and wanted to be an active part of that process.

After a shaky start, mediation made good progress. What we saw in the participants, particularly Sydney Water's side, was a shift from mistrust and a degree of arrogance to a consensus, if you like, and a degree of mutual respect so in group dynamics terms we actually did mature as a group and seemed to be working collectively towards a common purpose, which was to reach a conclusion and a solution that was acceptable to all sides and all parties.

That was our intention; that was our desire; and after seven and a half months, Mr Chairman, can I tell you that the community's involvement with that in my own case and there were others who put in many, many more hours, it meant a commitment on my part for seven and a half months of one and a half days per week, and you can multiply that by 12 to get a sense of the commitment that we made to reach a satisfactory conclusion.

We reached a conclusion, but not a solution, and the solution was that there was a health risk. Through the process of negotiation, or in negotiating the process, it was agreed that there were two

potential scenarios, not more than two, not less than two. The two scenarios were that either we would agree that there was no health risk, in which case we would move to a sewage public perception, and that was a word that we dwelt on for a number of meetings, that there was indeed a health risk from the gas pumping station being built in Scotts Creek.

The second alternative was that in the event that the health experts could not reach consensus, then the mediation process would move to find an acceptable alternative, an acceptable engineering alternative. Can I read from the executive summary of the mediation report wherein on page 1 it says:

> Prior to the experts—

That is the health experts:

> —meeting, the mediators have agreed that should the experts indicate that there would be a health risk associated with the proposed vent or lack of consensus on whether such a risk exists, the mediators would proceed to investigate alternatives to venting the tunnel at Scotts Creek. This was consistent with Sydney Water's obligations to follow the precautionary principle contained in its ecologically sustainable development policy and the EIS.

I would like to talk more about the ESD policy and the precautionary principle. At one stage, a possible solution was introduced, the so-called hospital-quality filter, which we were told was the golden egg that we in fact were turning our backs on. The golden egg either went rotten in the shell or was discarded in the garbage because it was never ever put forward as a serious option after that event.

So let us now turn to the issue of community consultation. As I say, our belief was that this was a process that had integrity. One of the reports that Mr Walker omitted to refer to when he was talking about the exhaustive process of evaluating all of the circumstances surrounding the tunnel was—and, unfortunately, the acronym was not mine but theirs—the CRAP tunnel, which is the Community Relations Assessment Panel, which subsequently got changed, once somebody realised what the acronym was.

This was a panel of three so-called eminent citizens who were there to look at the way in which the community consultation process had actually been conducted. Now, why that is more significant than it would be in normal circumstances is that this is an Alliance contract with none of the safeguards to the community that are built into traditional business-as-usual or design-and-construct contracts. It is not fixed price, it is not fixed term, and all parties to the contract actually get to share the pain and share the gain.

There were five principles enunciated by the Alliance, and it was said that they must satisfy these in order for the bonuses to be paid or penalties not to be incurred. These were cost/budget, time/completion, safety, community consultation and environmental responsibility. So they had created an expectation and a framework wherein community consultation was raised to a higher order.

So let us look at how they conducted that community consultation. I could give you my professional opinion and critique of that process, but there is no need because, in fact, the community relations assessment panel produced a number of reports.

The first of these was their first interim report, which was more than half-way through the mediation process. Now, if I can refer you to the document from the Alliance that actually sets out why that process is important, they say that to the knowledge of the Alliance partners, this project is the first construction project undertaken in Australia that includes rewards and penalties for performance in respect of building community relationships.

So what did the CRAP report say? Well, first of all, it said that there was a sense of the project being designed on the run without forethought and thorough preparation. They said in their introduction:

> Our assessment is that the performance has been patchy at best. Equally, there is evidence of a dispiriting recurrence of a sometimes high-handed and dismissive attitude that for many in the community at least is the hallmark of such projects. The community relations plan as the project's framework for the community is still a draft and has not had extensive exposure to or input by the CLC or the community generally.

And there are international protocols for this, all of which were disregarded. I could go on, but I think my time is running out. There were a number of other conclusions. The findings, if I can just very quickly cover those:

> At project level there are perceptions of a cultural lie and disrespect for the community.

These are all included in my submission, Mr Chairman. Can I just conclude by reference to ESD and the whole notion of the precautionary principle and what Sydney Water and the Alliance actually refer to in relation to that. From their own literature:

> Under our policy of ESD, Sydney Water is committed to work with the community to conserve water and avoid the release of harmful substances to the environment.

In their annual report they define the precautionary principle as:

> To reduce the chance of serious environmental problems even if we are not sure these problems will occur.

Another ESD commitment is:

> Do not preclude or dictate courses of action for future generations as a result of today's decision.

In our view, Sydney Water and the Alliance have not satisfied the community as to its integrity, its honesty and its competence. It does pose a risk and should not proceed. Thank you. And now I would call on Rosemary Gentle to put the school's perspective.

Ms GENTLE: Well, as Brian said, my name is Rosemary Gentle. I have been associated with Glenaeon Rudolf Steiner School for the past 30 years, as a parent firstly, as a teacher for the last 25 years and also as a director of the school. I speak to you on behalf of the staff and Council of the school but most particularly on behalf of the 500 students.

Glenaeon's position is very simple. Sydney Water should abide by the precautionary principle as it is upheld in international best practice, exercising extreme caution. And we placed a quote at the beginning of our submission, which I hope you will have seen.

Since the changes to the original EIS, as Brian said, Glenaeon has found itself in an untenable situation. Originally we were in support of the concept of the tunnel when references to an air exhaust and inlet vent adjacent to our property were minimal. However, in May 1999 the situation changed. Major modifications were made to the design of the tunnel. Those that have been spoken about before—the closure of the Tunks Park vent and the enlargement of the Scotts Creek arm—alerted us to the fact that there would now be a significantly increased volume of air being released in close proximity to our children, in fact, some 60 metres from our boundary, as we saw on the site visit.

From that point on, the school Council, under its duty-of-care obligation, committed to finding out all it could about the proposed vent and potential impact. To this end, we engaged the services of independent experts, microbiologists, engineers, doctors, air quality emission consultants and environmental lawyers, to name a few, and the cost of all that at the moment is upwards of $70,000.

Since it was in no way in our interest as a school to talk up the problems, we were hoping, as I am sure you will understand, that these reports would confirm the Alliance's assurances that all would be well. Sadly for us, this did not prove to be the case.

Each report, as it came back, raised our concerns about the possibility of health risks for our children. As Brian has just said, we then engaged in a very lengthy and exhausting mediation process, which again did nothing to allay our concerns as more and more unknowns emerged.

Post-mediation, we continued the exploration, and if I can speak personally, my feelings went from anxiety to alarm to very real anger as statutory authorities and government departments contradicted themselves. Sometimes even two people within the same department would pass the responsibility back and forth to each other like front-row forwards in a football team.

Many times I felt we actually knew more about the situation than the people we were talking to and I think it has been demonstrated this morning that we received answers like you have heard today—quite often manipulative and not giving the true perspective.

We are a highly intelligent community, we are reasonable people, and we followed that path all the way along; we are not hysterics, and we have often been made to feel that we are. While we have worries about maintenance, monitoring, filtering, et cetera, which we refer to in our submission, for us, it is all about health. From the beginning it has been extremely hard to get the focus away from other things, particularly odour and on to health.

In mediation, Sydney Water primarily depended on reports from two local health experts as well as a study of odour and health impacts by Holmes Air Sciences. The first expert was Dr Stephen Corbett. His letter from the Health Department was half a page only—it is in the mediation report. It is dated June 1999, and it was couched in very general terms, which showed no indications of any detailed briefing.

Professor Kerr, the other expert was slightly more detailed. He addressed some specific issues, but it also appears to be based on incomplete information. That is also in the mediation report. Other medical experts called, particularly Dr Mark Donohoe, who will be presenting tomorrow, presented an extremely detailed report, well substantiated by a great range of research materials which recognised the possibility of harm.

The experts all agreed there was an unquantifiable risk. Since then Sydney Water has given no indication, even this morning, that in the light of the issues raised they have asked the Department of Health to take another look at the matter—the very least one would expect under the precautionary principle. To the contrary, in a letter dated 3 August 2000, last week, the Communications Manager, Susan Love, said this:

> Independent health experts were consulted extensively, in assessing and ultimately determining Sydney Water's view on health risks. Professor Kerr is an eminent academic and researcher in public health and community medicine . . . Dr Stephen Corbett's views were developed with the full capability of NSW Health together with his many years experience in the assessment of health risks to the community. Their conclusion that the operation of the Scotts Creek vent is safe to the School students and the community is based upon a wealth of involvement of epidemiological studies.

Perhaps Sydney Water can then explain why in a meeting as recently as 19 July with Ralph Kaye, an air quality emissions expert who will be addressing the inquiry tomorrow, Dr Corbett stated that the Health Department was now convening an independent expert panel to re-examine potential health risks associated with the Scotts Creek vent. He even suggested that Mr Kaye may like to take part.

More importantly, perhaps, Professor Charles Kerr was approached by us on 4 July to ask if he had reconsidered his position in the light of ongoing changes not apparent in his original report. His response was referred to by Alex Walker this morning, a letter of 19 July, and in that letter Professor Kerr says that it is a complicated microbiological situation, and he referred us on to an expert. He said he understood our ongoing concern. He referred us on to an expert such as Professor Ray Kearney from the Department of Infectious Diseases from the University of Sydney, who will also be addressing you tomorrow.

We would like, however, to refer you to our supplementary submission which contains a copy of our letter to Professor Kerr, of his back to us and, then finally, the report from Professor Kearney. That report is critical, overall, of the Holmes Air Sciences report and of the appropriateness of the activated carbon filters and it concludes:

> Thus, on the balance of evidence, it is likely that emissions from such a vent upon cumulative exposure threaten to harm human health.

We have raised our concerns with Sydney Water, the Premier, DUAP, the EPA, and the Waterways Panel. They all refer back to Professor Kerr's review as the definitive document that states there is no risk. Professor Kerr himself has now deferred to Professor Kearney as the expert. Professor Kearney says strongly that it is likely that the emissions will threaten human health.

Alex Walker referred this morning to a meeting he had with me in May of this year when he expressed disappointment that there was nothing new. I would like to suggest, Mr Chairman, that there

is now. Where does this new information, where does this new reference to another expert higher than Professor Kerr, leave Sydney Water, the Premier, DUAP, the EPA, et cetera? I would suggest it leaves them very exposed, indeed.

When in doubt, don't—the precautionary principle. Where does it leave us? More determined than ever that this vent cannot be allowed to commence operation. Yes, it threatens our viability as a school, as the impact of the perception of a risk can be as damaging as the risk itself. Yes, it exposes us to the possibility of legal action some time in the future, against which Sydney Water has refused to indemnify us. Yes, it raises the question that some time in the future the Board of Studies may not be able to register us as a school as we may not be able to meet their health, fire and safety requirements. Yes, in the worst case scenario, it may force us to relocate and/or close.

For a school almost 50 years old, this is a tragedy and an extremely costly scenario. A conservative estimate would be $40 million. I have our balance sheets here if anybody wishes to see them. None of this is as important as the well-being of our children. We are not only educators; we are caretakers of these children. A school is a sensitive environment. All children are at more risk than adults as their immune systems are not fully developed. Compounding this is the fact that, under the Disability Discrimination Act, we have to accept all children, those with asthma, those on medication, those with leukaemia. We are currently enrolling a boy with multiple, chemical allergies.

One of the international studies tabled by Sydney Water in support of their position in mediation says:

> A primary difficulty in designing a definitive health watch concerning waste water aerosols is the lack of a sufficiently large, sensitive population. i.e, young children whose immunological defences against infectious diseases are still developing and who live close enough to the source.

That was a study done in Illinois in the United States. I have two comments to make to that. The first is the lack of such data internationally means no one any where in the world has been stupid enough to site such a source close to children and, secondly, we are not going to be the test case.

In the mediation outcome, again in the mediation report, it was accepted that Sydney Water would not proceed with any such development unless it genuinely believed that the development posed no risk to human health. The decision to proceed was stated as being on the advice obtained from their health experts, Professor Kerr and Dr Corbett. I suggest respectfully to this Committee that, surely, now there is no way theoretically, socially or morally that they and the Government can justify proceeding with this vent. An alternative must be found. Thank you.

Mr MORAN: I would now like to ask Marc Lee to address the Committee.

Mr LEE: Thank you for allowing us to speak. That is a very hard act to follow. Rosemary is protecting three of my kids. But anyway, I am going to give you a completely different picture. I am a design engineer with a degree from Cambridge. I have been involved in this process for almost one and a half years. I have attended nearly every mediation and nearly every technical subcommittee of that mediation. As I have said, I have three children, two at the school and one will be going in a year or so.

I live about 250 metres from this proposed vent. I am not going to call it our vent because I do not believe it is actually going to get there. I am a keen bushwalker and runner, so that means I have actually run through that site. There used to be a path through that site but, as you all know because you went on your site visit, there is a path right next to the sign posted path.

The next two days will be full of technical detail and political detail. We have already seen a lot of the political detail. Unfortunately we have not seen much technical detail yet. The only way that I believe we can all keep afloat through the next two days is actually to build up a big picture, a very simple picture, because it is simple, believe me, of what it is we are actually talking about.

This is what I want to do. That is my main contribution that I can make on top of everything Wendy, Rosemary and Brian have said, which I completely support. I forewarn you that actually the most important thing that is going to be said to you today is going to come after my talk.

What I want to show is that common sense clearly demonstrates that the exhaust from this tunnel should be treated in the same manner as a typical sewage treatment plant operation, not a slightly different version of a green vent that are all over Sydney, but a sewage treatment plant-type operation. It is of that magnitude. There are arguments that suggest it might even be more. There are certainly new features in it which are not actually addressed by sewage treatment plants at the moment to my knowledge.

But I would like to go back to your site visit. Unfortunately, I was not allowed to attend your site visit and I very much regret that. I did, however, try to get on at the time and I did manage to listen to the first 10 minutes which were outside the Scotts Creek site. But since then, I have had an idea of what you actually saw. I particularly wanted to know what you were told on those site visits at Scotts Creek and North Head because I wanted to know how much I could add to this picture.

At Scotts Creek you stood next to a black pipe, a nice, shiny, new black pipe which is the one that goes down to the creek. That is the size of a normal sewer pipe. It is actually a metre in diameter. At North Head I believe that you stood inside a 6.5-metre diameter sandstone tunnel, completely different materials, dark and obviously a completely different situation than a sewer pipe.

That tunnel, if you could see far enough, was 20 kilometres long. It does split at Tunks Park. In fact, overall, it is about 21 kilometres long. The size of that tunnel—I will give you the figures—500 million litres. Now, what is that, you might ask yourself. I could say it is 500,000 cubic metres; 500,000 cardboard boxes a metre across, but that is still difficult. It is 10,000 living rooms. But that is still hard. All you have to do is walk out of this door and you will see that it is two MLC Centres. We have checked up the dimensions of that. It is almost exactly two MLC Centres. That is the size of the tunnel.

The other thing I would like to add to that is that the tunnel is not actually a tunnel. It could be called the Northside sewage tank and the reason for that is a tunnel has very little fall on it. We were talking about the flow rate that might go down the tunnel. The fall in that tunnel is four metres over one kilometre. If you parked your car in there and took the hand break off it would not roll. It is a tank.

Another way we can actually show that it is a tank is that one of the alternative solutions in the early days to the tunnel was actually to put a huge tank under North Head. Why did they not do that and connect it up with smaller pipes from all the overflows? Well, the reason is that they could not clean it properly. So, we now have a tank, a Northside sewage tank. How does it fill? How fast can it fill, this two-MLC-Centre volume worth of tank?

Well, if you work out the statistics for the two worst overflows a year, which Alex Walker told you, in fact it is two to four times a year. That tunnel will fill to the brim fast and it will overflow into Scotts Creek for up to 10 days afterwards. The time that it takes to overflow the tunnel is under 12 hours. The whole tunnel will fill up and vent out in under 12 hours, and that is on their statistics.

Now, Scotts Creek is planned to get two-thirds of that air. Strictly speaking, the first 15 per cent goes out at North Head. Scotts Creek actually gets more than an MLC-Centre worth of air in under 12 hours. This is why these continual allusions to green vents is ridiculous. There is no green vent in the world that does anything like that. If we have to hear more of this rubbish that we have been hearing today of it being spread over a year, I do not know how many times I have heard that kind of comment. It is utterly ridiculous.

If it is coming out in that time, then we have a sewage treatment plant operation, maybe it is only for two days a year—in fact it is more like 30 or 40 as we have heard—but we do not want it for any days a year. Are we going to be able to choose whether we are there or not on the days it actually behaves like a sewage plant operation? The answer is obviously no. So, when it fills, what happens? This is not rocket science here. It is a tunnel. It is a hole in the ground and it can be vented any where.

I would like to continue, please, because this is very important. I want to give you a picture of exactly what you are going to be talking about for the next two days. That tunnel can be vented any where. It is just plumbing and by plumbing I am talking about pipes of less than the black one you stood next to—0.75 of a metre in diameter. You can pipe that vented air out from the tunnel any where you want, any part along the tunnel. You can actually pipe it somewhere else.

It was originally going to come out at Tunks Park or most of it. They did not want it, so it moved to Scotts Creek. The point I wish to make is that you can put it any where and it is just plumbing. The question is whether the will is there. The surface area of this tunnel is about one kilometre by half a kilometre. That is more than double the surface area of the sewage treatment plant.

The reason I mention that is that tunnel will contain pressurised sewage, up to 10 atmospheres at North Head. Where you were standing at North Head, if you had gone to the tunnel down the bottom, the pressure in that would reach seven to 10 atmospheres when it is full. That is serious pressure for sewage. That surface area of the whole tunnel which, as I say, is a kilometre by half a kilometre, will be contaminated. There is no question about it. It takes 36 hours to drain it.

We heard discussion this morning about the flow rate in draining it or that the sewage coming down later will sweep it all away. When you were standing in that six and a half metre tunnel, the level to which that tunnel will be flushed is your waist height, point 7 of a metre. That is it. Nothing above that will be cleaned. Even then, it is going to be flushed with sewage, so I will leave you to draw your own conclusions with that one. The speed at which that tunnel drains, it drains in one and a half days. If nothing is coming in to it, those pumps can only pump out in 36 hours or thereabouts, one and a half days.

That equates in a 20 kilometre tunnel to it taking three hours to drain every kilometre. Okay? So that is a tenth—well, it is actually a twentieth of normal walking speed. You could crawl at that speed. That is the speed that it is actually draining. It is like the tide going out. When the tide goes out you see scum, and that is what you are going to see in the tunnel. In the tunnel we have not got the fresh sewage that we have in the normal small pipe.

If you look in one of those pipes, it is flowing; you can hear it. In the tunnel we have old sewage. It could be hanging around there for days. It is mixed up. Depending on the storms, it could be there for days. And certainly the sediment from it could be there for days. In fact, from what we are hearing, due to the cleaning being inadequate, it will be there forever. So we have a pressurised surge in a dark, damp tunnel with no ultraviolet [UV] to kill the germs, not fully empty for many days, possibly weeks, not cleaned, and we have a tunnel inside surface area of about double the size of the North Head Sewage Treatment Plant.

So, with that picture in your minds, you can go into tomorrow and the rest of today with investigations into technical detail, but I want to ask you, even if it only exhausts for 15 to 20 days a year or 30 to 40, would you please tell me whether you would exhaust this right next to a recreational bush area, 65 metres from a school boundary, 80 metres from a playground—I am aware of some of my words perhaps not getting through to all members of the Committee—100 metres from houses, in the middle of a steep-sided valley with frequent trapped mist and clouds inside it, or would you spend, even if it was $30 million, but in fact we have an official estimate that it is between $10 million and $16 million, to protect the children who are next to it, to protect the residents, to protect the old people?

Sydney Water is just about to commission this tunnel. We have run out of time. It is building it. The Health Department is still looking at this. You have heard all the evidence today. There will be more tomorrow. Are you really going to subject our community to this? On a commonsense basis, think about it, please. Thank you very much.

Mr MORAN: Thank you, Marc. Now Helen Scard from the parents.

Ms SCARD: My name is Helen Scard. I am the mother of two Glenaeon School students. I have only a few minutes to address you, so I will speak as plainly as possible, but with an open heart.

Firstly, I must say that Sydney Water and the Alliance behave as though the world belongs to them instead of remembering where we all belong, with other living things on earth. This is part of the philosophy of our school together with ideals whereby children are revered, their spirits nurtured, respect for their individuality and developmental capability.

The earth has paid a great price to teach us that technology, no matter how beneficial, has costs which cannot be anticipated beforehand. It is the human instinct that has always led us. Science

has followed behind. As I have educated myself on this project, my instincts have indeed been heightened. Regardless of carbon filters, it does not smell right, taste right, look right or sound right.

My maternal instinct says I must protect my children, and I will, as will 500 other mothers and fathers. I will pose a question which comes to mind only because the logic of proceeding with this project is beyond my comprehension. Is this a land grab? Who wants to devalue our community and go to extraordinary lengths to do so?

When we realise that we cannot go on trying to solve environmental problems like asthma, Legionella, breast cancer, lymphoma and so on by finding cures after the fact we will realise that we have a choice. Your individual choice is to respect at this moment the importance of healthy children, to ensure our survival as a species, to ensure that they are protected above all else.

There can be no problem, no event or situation, no perplexity that vision will not solve. I am asking for your vision. "Motivated by love" were the words used to the Chairman of Sydney Water in seeking answers to our expressed concerns. Love is infinite. It goes on and on forever. We will not go away. No amount of intimidation or bullying will stop us. Let love be your power, for our children's safety lies in truth, and in so doing let the truth be as it has always been—there for the asking. Thank you.

Mr MORAN: Mr Chairman, that concludes the community's submission. We understand that Sydney Water will be presenting again tomorrow and we would like the opportunity to have time after that for a rebuttal of anything that comes out of tomorrow, if that is within your jurisdiction to grant.

CHAIR: I believe that it will be possible for the Committee to resolve that.

The Hon. JAN BURNSWOODS: But, Mr Chair, we have not got Sydney Water listed to come back tomorrow.

CHAIR: I think if we want them to come back tomorrow, there is a provisional draft.

The Hon. JAN BURNSWOODS: No, it was changed Mr Chairman.

The Hon. J. H. JOBLING: The Committee, Mr Chairman, did consider the option of Sydney Water coming back. The provision was to be left there should they wish to come back or should we wish to have them back.

The Hon. JAN BURNSWOODS: I just meant that we should not assume that they are coming back.

CHAIR: We can discuss that later in deliberation.

Mr MORAN: Mr Chairman, obviously, if there is the opportunity or if they are required to come back, also we would like to have a second opportunity.

CHAIR: I understand. We will discuss that later.

The Hon. P. BREEN: Rosemary, you mentioned this letter from New South Wales Health, Stephen Corbett's letter of June 1999, which was written, I think, a month after the change in the design specifications. In that letter he says:

> Levels of most gases in the discharges presenting a health risk are not known.

That, to my mind, is a red alert. Your solution, I think you suggested would cost between $10 million and $16 million. Could I just clarify what your solution is so we do not have any doubt about it?

Mr LEE: Yes, sorry, I had meant to get on to that, but I was running out of time. The solution is very much like the North Head solution. I am suggesting that you actually implement the pipe back from the North Head end; in other words, you build it down from the North Head plant and you put it

along the roof of the tunnel or along the side of the tunnel where it is. It is just a pipe about this size, 0.7 of a metre in diameter.

If you implement that solution, then the tunnel may be operated up to 15 per cent full with no pipe. Every time you add another kilometre of pipe or two kilometres of pipe, you can fill the tunnel another two kilometres up, and it actually ends up being exactly the same solution as the Chairman was referring to for Tunks Park, where you have the pipe all the way up to Tunks Park. If you did it up to Tunks Park, you could fill the tunnel up to Tunks Park 80 per cent full with no venting at Scotts Creek. If you carried it on to Scotts Creek and Lane Cove, and you would have to bridge it as a Y there, then you could include that.

Now, through the technical meetings, it would appear that that needs some sort of fan sourcing to make it work. It can be sucked from the North Head end, but that is probably not powerful enough, so it would need some sort of inline fans to do it—maybe every couple of kilometres is the advice we have been given so far.

So that is the solution: a simple pipe, nothing more, with inline fans inside it to help the air flow along it. The indication we have been given for the Scotts Creek part of it is that it would be at least as low as $16 million. But let me go to the cost just quickly. In the mediation they said $24 million plus an extra 25 per cent loading just in case. In the CLC for the same solution they said $18 million.

We got a costing that dropped it right down to $16 million and possibly as low as $10 million depending on the cost of the pipe, which we did not actually get to suppliers about. But we assumed Sydney Water's costing for the pipe, and that is what came to $16 million. If the pipe cost was lower, it would come down to less than that. You would have to add in a little bit more for the Lane Cove end if you wanted to add Lane Cove into it.

The Hon. J. F. RYAN: Have you supplied that information to the Committee?

Mr LEE: No, the information was given in confidence by a large engineering organisation which has dealings with Sydney Water.

The Hon. A. B. MANSON: Will you provide it to the Committee?

Mr LEE: I would have to go back to my source. If it comes down to it and if that is what you are worried about, whether it is $16 million or $24 million, then, in fact, obviously the proper way to go would be for Sydney Water to go out to tender or the Alliance to go out to tender, but if that is what it comes down to, that you would do it for $16 million but you would not for $24 million or $30 million, I guess I would go back to my source and put that question, but at the moment they are afraid of losing work.

The Hon. P. BREEN: I think Rosemary also wants to answer the question.

Ms GENTLE: I just wanted to say two things. The cost on a percentage basis of the whole cost of the Northside Storage Tunnel seems small, whatever it is, but you heard Alex Walker say, and it has been said before, that if they got those extra funds, there are a whole lot of other things that they prefer to spend them on rather than this, which has been a constant frustration for us.

The other thing that struck me this morning when I was coming is that this tunnel is an extraordinarily expensive tunnel, and when you listen to how many days it is going to be operating, it seems a huge amount of money to pay for the small amount of days. It just does not seem logical, and it has been this lack of logic that has eroded our confidence and trust all the way through.

The Hon. A. B. MANSON: Rosemary, you raised Professor Kearney's submission in your submission. My question is: was Professor Kearney fully briefed before he presented his submission on behalf of the school?

Ms GENTLE: Yes, he was.

The Hon. A. B. MANSON: Did he have a briefing from the Alliance into how the vent will work? Professor Kearney stated that he is unsure how often the vent would operate, and he guessed it would operate up to 125 to 180 days per year, which is contrary to what we heard this morning. Do you still feel that you have been advised to a standard higher than the people from the project you have been dealing with?

Ms GENTLE: Yes, I do. He has been very fully advised. He received copies of the mediation report. He has been advised by Ralph Kaye, who is an air quality emissions expert, and he read those things very thoroughly before he came to any conclusion. As Professor Kerr says, initially Professor Kerr consulted with him in the first place, so he has actually known of this vent as an ongoing thing, but you will have the chance to ask him that tomorrow yourself.

CHAIR: Professor Kerr is coming to give evidence before us, so we should perhaps delay some of our questions on this matter and wait until he comes before us.

Ms CUNNINGHAM: The question of the quality of the briefing behind the consultants has been our main concern from day one. We did an enormous amount of research ourselves. We had specialists within our community, microbiologists, doctors, engineers, and we sought other advice. As Rosemary said, the school spent a considerable amount of money seeking advice, and that is not money that the school would happily spend if it means it does not fund a teacher the next year. They are the sorts of decisions we have to make.

We have not been squandering money on this process, but we have sought advice. The thing that alarmed us more than anything else right through the process was that we felt we had done our homework better than the people we were talking to at Sydney Water and the Alliance and even the Health Department, and when we first saw Dr Corbett's report from the Health Department on which Sydney Water and the Alliance were placing all of their trust and saw that it was a half-page report or a half-page letter, which was prefaced by the words "Based on the information [you have given us]", we were very concerned.

We have sought consistently for over a year to try to get the details of the briefing that Dr Corbett and Professor Kerr were given originally. We have not been able to do that, and I believe there have even been questions asked in Parliament and they have not actually been produced except to refer to the documentation that is in the mediation report.

If you look at the documentation that is in the mediation report that has been supplied by Sydney Water, the vast majority of it is just general articles in the literature about health treatment plants and so forth. There has not been specific research about this process.

We went to mediation. One of the reasons for going into mediation was that we had two sets of experts, experts called by Sydney Water, who said there was no problem and experts who we consulted who said that there was a problem, and the whole point of going to mediation was to try to put those together and try to calmly work through that information, and we called on the experts panel to try to do that in an even-handed, rational way instead of just a battle between opposing experts.

Fundamentally, we do believe that the experts Sydney Water had asked to comment did not understand the way the operation of the tunnel would work, did not understand the conditions that would be present in the tunnel, particularly at times when it was full of raw sewage, did not realise that the tunnel was not going to be flushed and did not realise that the vents themselves, the filters in the vents could cause some problems in their own right.

We felt they had not been briefed properly on an engineering level and the implications of the engineering side. For that reason in mediation, before we asked the experts to form their panel, we gave them a joint briefing. We had an evening where we briefed the experts so they had a common base of knowledge on how the tunnel was to operate, that the experts were somewhat disturbed to find that such things as the filters were actually designed to take out smell and hydrogen sulphide and not to take out pathogens, that the pre-filter was designed to take out grease and not pathogens, that the tunnel was not going to be flushed and all those things that the community had been aware of but that the health experts advising Sydney Water had not been aware of.

Much to our regret, Dr Corbett did not bother to come to that briefing. When we went into the mediation over the following day, when the expert panel met, Dr Corbett had still not received a briefing about how the tunnel would work and appeared not to have read any of the briefing papers or documentation provided. So, when we have consulted experts, we, of course, have made it our business to make sure that they are properly briefed.

We have tried to brief them in as thorough a way as we can because we do not want to be open to that same sort of criticism we have given to Sydney Water experts. They have got all the information, the EIS, the REF, that Sydney Water has provided as well as what we have provided. I think the essence of this whole thing for the community is that we feel we have done our homework very much better than the proponents of the project.

Mr MORAN: Since reliance has been placed so heavily on the Department of Health as the sole arbiter of the health of this vent, their expert did not actually come to the briefing.

Ms SCARD: May I just say I had a meeting with Gabrielle Kibble, Chairman of Sydney Water, together with another mother. We asked her for a copy of the original health briefing and she agreed to get that for us. Susan Love, Communications Manager, replied and thanked us for the meeting but did not include that original health briefing. Nobody has seen the original health briefing.

The Hon. JAN BURNSWOODS: I want to follow up something Mr Lee said before. I gather you were a member of the mediation technical subcommittee?

Mr LEE: That is correct.

The Hon. JAN BURNSWOODS: Arising out of that process, costings were prepared and there was a written document finally?

Mr LEE: That is right.

The Hon. JAN BURNSWOODS: As it seems you do not agree any longer, you do not agree with the costings in that document?

Mr LEE: No, I do agree. That document clearly states that we agree with the relative costings. We set out to compare costings of the Tunks Park one where the actual vent pipe stops and, yes, I do agree with the relative costings. They are all high.

The Hon. JAN BURNSWOODS: Following on from that, you referred before to costings for a separate cost and I think you said you were unable to give those to the Committee.

Mr LEE: No, what I referred to was when we got an independent costing for the return pipe to North Head, the same as in the mediation, after the mediation because we suspected that we wanted a second opinion basically, we went out and the costing that we got, we actually went through the costing process outlined within the appendices of the mediation for that. We basically properly costed out all the items except for the pipe cost itself. So if we assume Sydney Water's costs for the actual pipe inside, then we got to 16 million or thereabouts.

The Hon. JAN BURNSWOODS: What was the information you said you could not get?

Mr LEE: It was not that we could not get, it is just that we have not had time to do it, to find the real cost of buying that pipe for that tunnel. It could actually mean the 16 million drops as low as 10 million, but I am not prepared to say that now. That was the estimate given to us at the meeting.

The Hon. JAN BURNSWOODS: You made a certain recommendation.

Mr LEE: Are you asking why I cannot reveal the source?

The Hon. JAN BURNSWOODS: I think you said you could not because of commercial-in-confidence reasons.

Mr LEE: They basically came forward on the basis that we did not tell Sydney Water who they were because they are working with Sydney Water.

The Hon. JAN BURNSWOODS: May I suggest to you—many of us here have been on numerous parliamentary committees—I think you perhaps should consider letting us have that information. There are very strict rules of in-camera evidence, confidentiality of material, and parliamentary committees do have those strict rules and we are all used to sticking by them. There is obviously a difficulty if you try to hang your hat, so to speak, on something you want to tell us where there are mechanisms under which you can give us information.

Mr LEE: If the Committee requires it, I am prepared to go back. I am not hanging my hat on it. Sydney Water said it was 24 million plus a 25 per cent loading. The CLC actually costed in at 18 million beforehand for the same one. This is prior information. It is all on the public record. This person actually costed it in at 16 million or round about, possibly saying it could drop further if the pipe was cheaper than Sydney Water said. What you could perhaps do, if I could make a suggestion, is go back to the original costings of the Alliance, the CLC process, which came out as 18 million and—

The Hon. JAN BURNSWOODS: In some ways it does not matter. I suppose what I am trying to say to you is if you want to say in evidence what you have just said, it really has very little weight unless the Committee can test it by knowing who is saying it and what it is based on. We have a range of provisions for confidentiality and the security that it brings. It is something you should think about, I think.

Mr MORAN: I just want to add one particular point to that. I was also an adviser to the mediation or, rather, an observer throughout and was involved in some of the discussions about the technical efficiency of that particular option. That was a best estimate. Clearly, it was done on the basis of what the engineers at that time thought was feasible and was, if you like, of the higher order of the costs.

Naturally, were Sydney Water to seriously consider such an option, they would, as they are required to do, I believe, go out to tender and I think we could confidently predict that they would get a substantially reduced rate and may even get a better design option. There is no question that we are reneging on our commitment made in mediation. Rather, we took it at that value as a first-pass estimate cost and obviously that would be, I think, substantially reduced.

(The witnesses withdrew)

(Luncheon adjournment)

STEPHEN JOHN CORBETT, Specialist Public Health Physician in Environmental Health and Manager of the Environmental Health Unit, New South Wales Health Department, Gladesville Hospital, Victoria Road, Gladesville, and

CHARLES BALDWIN KERR, Professor, Preventive and Social Medicine, University of Sydney, Department of Public Health and Community Medicine, University of Sydney, sworn and examined:

CHAIR: Dr Corbett, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Dr CORBETT: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr CORBETT: Yes, I am.

CHAIR: Professor Kerr, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Professor KERR: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Professor KERR: Yes.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee will usually accede to your request and resolve into confidential session. But I should warn you that the Parliament may override that decision at any time and make your evidence public. Do either of you wish to make a statement?

In the Department of Health submission, on page 3, Dr Corbett, you mention Legionella and you say it is present in raw sewage and conditions in sewage are not conducive for Legionella proliferation, particularly in a storage tunnel. We have heard, so far, anecdotal evidence that in fact it could well be a problem with Legionella being emitted from the vent, say, 20 to 30 days a year. Can you give an absolute, iron-clad guarantee that it will not?

Dr CORBETT: I think for organisms such as Legionella it would be difficult to give an iron-clad guarantee about the immunity from the effects of this disease. Having to deal with Legionella as a public health problem, we do know not just about its biology but its behaviour as a public health hazard. In this regard I think that any potential risk from Legionella has to be assessed very much in the context of what we know about its behaviour as a public health hazard.

Clearly, information about its biology, its temperature dependence, is germane to that discussion but it is certainly not the only factor you would use to assess the potential hazard. To give you an example, Legionella outbreaks have most often been associated, as most people would be aware, with air cooling towers. There are 15,000 or so of those in Sydney alone. New South Wales Health regulates that as a public health hazard.

We are familiar with, to a certain extent, the conditions under which outbreaks of Legionella can occur and, I guess, we have made a judgment in this situation that, whilst it is a theoretical possibility, we have to look at whether it is in our view an actual possibility, and our judgment in this case has been that it is not. So, I do not think we are in the business of giving absolute guarantees about safety. With a ubiquitous organism such as Legionella, I do not think that is possible. Our judgment is that the risk is extremely low in this context.

CHAIR: Would you be aware of what other pathogens may be vented at the Scotts Creek vent?

Dr CORBETT: Sewage contains a cocktail of pathogens. Human sewage, obviously, from a city of this size, will contain an enormous number of pathogens potentially. The question to ask, though, is it a realistic scenario to paint that pathogens will be emitted from this vent which will be a cause of public health concern above and beyond that exact risk with which we are very familiar and have been familiar, I should say, for the last 100 years.

CHAIR: Are you aware of the proposed filtration system at the Scotts Creek vent?

Dr CORBETT: Yes, I am.

CHAIR: Are you aware that it is not designed to filter out viruses and bacteria?

Dr CORBETT: Certainly, the design of the system is primarily to control odour. In assessing the risk associated with filtration at this system we had to make a judgment about the likelihood that aerosols of respirable size would make their way through a fairly tightly packed, activated carbon filter. But we are making no a priori judgments about that likelihood.

Common sense would dictate that large droplets of water would have trouble making their way through a granulated carbon filter, but what we are asserting is that it is an eminently testable proposition to see whether aerosols in fact do escape from the filter.

The Chief Health Officer, Dr Andrew Wilson, convened an expert group last week. Independent experts were assembled to evaluate just this risk because the risks of Legionella have figured large in the latter part of this debate about the potential hazards of this tunnel. The thing that we discussed at that meeting was that this is an eminently testable proposition and we discussed with Sydney Water the possibility of testing it.

I think the other very important issue to raise in relation to any risk associated with Legionella is that it has to be taken in the context of what we know about the public health hazard of Legionella.

In that light, I would commend to the Committee a video of the current situation at Scotts Creek, because in our view the potential for aerosol generation with the current scenario at Scotts Creek seems to me to be—there was a video, I believe, of such an overflow—something that has been largely unexamined in this debate. Certainly, having seen that, I think it would be important for people here to see that because if we are talking about trying to get some handle on the context of this risk, I think we should at least look at what we are going to replace, and I think our strong view is that the risk management strategies which will accompany the installation of this vent will be an order of magnitude greater than what currently exists.

CHAIR: Are you aware of the conclusion of the mediation process in relation to the health risk and the dissension of two or three health experts?

Dr CORBETT: Yes, I am. I was involved in that process.

CHAIR: Do you think those two health experts who were concerned are in fact wrong?

Dr CORBETT: Well, I was present at those mediation sessions, and we presented a contrary view. There is always scientific debate about these matters. I stand by what we said and I see no evidence, convincing evidence, to change from that position.

CHAIR: Is it not possible for Legionella to actually breed in activated carbon, as was suggested this morning?

Dr CORBETT: That has been raised also as a theoretical possibility—again, an untested hypothesis. But, of course, in any new system like this we have to take notice of new potential problems. Certainly, when I met with Mr Ralph Kaye in my office some weeks ago he raised this and expanded on his concerns about this possibility, and certainly that was one of the issues that we took to the expert group convened by Dr Andrew Wilson.

As I have said before, it is an eminently testable proposition. Without aerosol escape from the charcoal filter, the risk of Legionella is extremely small. That is a testable proposition. We do not believe that it will be significant. We are happy to put that to the test.

The Hon. J. H. JOBLING: When are you proposing to do that?

Dr CORBETT: As I said, last week we discussed with Sydney Water, or we advised Sydney Water that it was an eminently testable proposition and we attempted to identify an analogous situation within the Sydney Water system which would give us an insight into the potential hazard from generation of aerosols in this situation, and my understanding is that Sydney Water is proceeding to do that.

The Hon. J. H. JOBLING: You have advised them to do that?

Dr CORBETT: That was our advice at the meeting, yes.

The Hon. J. H. JOBLING: Was that in writing to them or just verbal?

Dr CORBETT: No, we had this meeting last week and there has not, so far as I am aware, been correspondence on that.

The Hon. J. H. JOBLING: It would seem to me that activated charcoal is a well-known substance. It would not be that difficult, in view of the potential that it could raise, if in fact those pathogens and the whole broad spectrum of them and Legionella were to actively breed in the activated charcoal and when you do then get a heavy charging of the pipe the air will of course be expelled through. I would imagine laboratory testing or modelling, or have you looked for any information that is available in the scientific world to test with scientific rigour and resolve yea or nay?

Dr CORBETT: Yes, I think we have. As I said, we are pretty familiar with the risks of Legionnaire's disease. I think it would be fair to say that the controls of Legionella have come under serious scrutiny since the epidemic in Melbourne in recent times, and if it has not already been made clear to the inquiry, the testing of Legionella in air, to try to grow it in the air, is not something that is ordinarily done. We more often look for it in the source.

This theoretical possibility has been raised. I do not think we deny that possibility. The advice we have received from our own expert microbiologist tells us that it is unlikely in this situation for a number of factors. I believe the factors associated with pH, the absence of sunlight, et cetera, make it unlikely that Legionella will grow in this situation, but I think, even more than that, the physical barrier which that filter places in the way of aerosols so that such aerosols that are generated in the system impact on that and are removed, we suggest, is going to be the most important factor in reducing risk, if there is any.

The Hon. J. H. JOBLING: But, seriously, can I come back to the proposition that the perception of the residents in the area and the people who have children at school is that here is a major problem. It is something that if you were to push Sydney Water, which is claiming in evidence this morning that you are the expert on whose testimony and advice they rest, would it not seem to be a way to deal with the perception to actually undertake as a matter of urgency this testing and either prove or disprove it to a reasonable degree to put the residents' minds at rest?

Dr CORBETT: As I said, we have advised Sydney Water at our meeting last week to proceed down that track as being a way to bring more evidence to bear on this decision, and I think that that advice will be heeded.

The Hon. A. B. MANSON: If I could ask Dr Corbett a question relating to Professor Kearney's report, the first part is: have you read Professor Kearney's report in relation to the Northside Storage Tunnel? Could you make any comment about his conclusions in relation to the next three issues: first, communal exposure to emissions from the vent; second, the effectiveness of filters in relation to microbial pathogens; and, third, general conclusions?

Dr CORBETT: Yes, I have read Professor Kearney's report, and I am, of course, aware that he arrived at different conclusions than did the deliberative panels which we assembled in the department. I think the first point I would like to make is that it was clear to me from this report that Professor Kearney did not fully understand the operation of the proposed tunnel as I understand it to be.

We had a very different sense of how many days a year this was going to be of concern, under what circumstances hazard would be an issue, and I think that seems fairly clear from his discussion about the number of days, et cetera, which the hazard would be there.

I also think that—and not in any way detracting from Professor Kearney's expertise in issues of Legionella biology—what was missing from the report from my perspective was how to place this particular risk of Legionella in the context of the risk as we know it as practising health physicians in New South Wales, and I think, as I said, it is important for us to make a very important distinction between theoretical and actual possibilities in terms of the potential to cause disease, so to me that was missing from the report.

There seemed to be a lot of discussion about particle size and cumulative effects, and I was not quite sure of the relevance of that to the discussion. When he spoke about cumulative effects I assumed he was talking about exposure to chemical pollutants, and I think that I am certainly convinced that exposure to hydrogen sulphide, a major gas pollutant from sewers, is an order of magnitude below a level that is likely to cause health effects. So I do not believe there is a concern there.

If he was talking about, and it was not clear to me from the report, a cumulative exposure to pathogens, again, I was not quite sure of the point that he was trying to make, but any exposure to pathogens we would regard as being unacceptable from this vent.

Our view is that this is not a hazard in terms of exposure to pathogens, so remarks about cumulative effects, in a sense, do not assume a lot of relevance in my own view.

He made some assertions in his report about the effectiveness of filtration. I think they are untested assertions. As I said, I think they are eminently testable assertions, and that is the avenue in which we are proceeding at the present time. I think I have already indicated I disagree with his conclusions about the magnitude of the risk of Legionella in particular in association with this tunnel.

As I said, I would very much like to see his comments. I am sure he has not been able to see the video of the tunnel in overflow mode because all of the comments that he mentions in his report would equally, and I would suggest would much more, apply to the current situation because those overflows will occur with the same or a greater frequency than the number of times a year the air will flow back through that filter.

The Hon. A. B. MANSON: This morning a representative of the community said—

CHAIR: Mr Manson, excuse me, I was just going to ask a question. You will have to wait a moment.

The Hon. A. B. MANSON: You have already had seven questions.

CHAIR: You would be aware, Dr Corbett, would you not, that the filter is not designed to remove viruses and bacteria? You are saying that bacteria and viruses will be stopped by the filter. That is in fact a contradiction.

Dr CORBETT: Well, I do not believe it is a contradiction. I think people should really examine that proposal. It is quite clear that these filters are not designed for that; they are designed to control odour. The scientific question is whether the physical barrier of these filters, which is not insubstantial, captures aerosols generated by these tunnels.

CHAIR: You think it will?

Dr CORBETT: My understanding is that it will. Common sense would dictate to me that small charcoal particles will capture a large proportion of droplets capable of carrying Legionella organisms, but we are not resting on that assumption. What we are saying is that it is testable. You can test to see whether aerosols escape from those filters. Having established that it does or does not, I think we can then proceed to establish whether there is a substantial risk. I guess my experience would tell me that it is unlikely that it will be a risk, but we are happy to proceed down the track and do that.

The Hon. A. B. MANSON: Dr Corbett, this morning a representative of the community said you did not understand the operation of the tunnel and it was also said that Dr Corbett appeared not to have read the documentation about the vent. How do you respond to that?

Dr CORBETT: I believe I understand the operation of the tunnel. We originally made comment on the proposal when it was first mooted. Subsequently I have learnt a lot more about the tunnel in the course of talking to the community, in the course of talking to the proponent. I have seen working models of the tunnel. I believe I have a sufficient understanding of the operation of the tunnel and the potential hazards associated with it to, I guess, validate my views.

The Hon. A. B. MANSON: And what about the reading of the documentation?

Dr CORBETT: I read the documentation. I think it is important to point out that the role of the New South Wales Health Department is not as a consultant to Sydney Water or the proponent here. We are a bureaucracy, we are part of the Government. We receive documentation for comment about development proposals, about potential risks. It is part of our work. And we read that documentation and we make our professional comments.

Now, when I first received the reports of this issue we provided an opinion. I think it is fair to say that at the time we provided our initial opinion we were unaware of the depth of community concern about this proposal and subsequently we have learnt a great deal more about those concerns and about the potential risks, and I think our comments have absorbed that information as we have gone along.

The Hon. P. BREEN: Dr Corbett, could I just ask a couple of questions about your understanding of community concerns?

Dr CORBETT: Yes.

The Hon. P. BREEN: You just said that you subsequently became aware of the depth of community concerns.

Dr CORBETT: Yes.

The Hon. P. BREEN: Could you tell me when that was?

Dr CORBETT: I do not know if I can tell you dates. I think the first contact we had with this issue was when we received the REF report. But then I was subsequently called, along with Professor Kerr, to be a member of the community consultation panel, and that was really the first opportunity that we had.

In fact, this was a slightly unusual proposal in some senses in that the first time that the department became involved in terms of talking to the community was at a mediation session. Quite commonly with these proposals, we get involved directly with community members before that but my first real involvement was as, I guess, a public health expert and member of the mediation panel that was called, whenever that was. I cannot recall the date.

The Hon. P. BREEN: Were you aware of the concerns of the community in June 1999? On 7 June 1999 you wrote to Andrew Wild, Northside Sewerage Tunnel Alliance. Were you aware of community concerns when you wrote that letter?

Dr CORBETT: I think what you are referring to is the initial response that I wrote in response to the REF.

The Hon. P. BREEN: I am anxious to know whether you were aware of community concerns.

Dr CORBETT: As I said, my full appreciation of those concerns only really occurred, in the absence of any direct contact with the community, when I first sat on the mediation panel. I cannot recall the date of that.

The Hon. P. BREEN: Was it after June 1999?

Dr CORBETT: I am not sure of the date. I have not seen the letter you are referring to so perhaps I should do that.

The Hon. JAN BURNSWOODS: The dates can obviously be checked. Is there some significance in the date?

The Hon. P. BREEN: There is, if I can ask the question, yes.

Dr CORBETT: Yes, this was based on my assessment and the assessment of people in my branch on the document itself that we were asked to review.

The Hon. P. BREEN: The question, again, were you aware of community concerns when you wrote that letter?

Dr CORBETT: As I said, I would have to check on the dates. That was written in direct response to the report. That is all I can say. I first became aware of those concerns when I attended that mediation session. I cannot recall the date of that session.

The Hon. P. BREEN: You do not know whether that was before or after?

Dr CORBETT: I do not know that it would actually alter my views that are expressed in that letter.

The Hon. P. BREEN: That is the next question. In this letter you have said, "Levels of most gases in the discharges presenting a health risk are not known."

Dr CORBETT: I think you should be aware that, in writing a letter such as this, what we have available to us is the information that is contained within the REF report. We raised this issue of trade waste discharges as a potential for concern. I think in the REF report, from memory, concerns were raised about the possibility of volatile substances being emitted from this vent which would not be captured by a filtration system.

Subsequently, when we questioned the proponents about this matter, I think we gained some reassurance that, given the level of control of trade wastes in sewage, and given that this is an overflow vent which really overflows with dilute sewage, we were reassured that any hazard from trade waste in sewage was extremely low.

The Hon. P. BREEN: Would you be able to say now, without qualification, that most of the discharges presenting a health risk are now known? Would you make the same statement now that you made in June 1999?

Dr CORBETT: We do not know exactly how much trade waste there is in sewage, that is true. I guess what we know now is that this is a sewage overflow tunnel. I have been reassured subsequently that the level of trade waste making its way into sewage is extremely low. I am confident that potential hazards related to volatile chemicals from within the system are not an issue in this context. And that, I guess, is what I was trying to communicate in this letter.

The Hon. P. BREEN: Is it fair to say you now know what the level of pathogens would be in this system?

Dr CORBETT: That is a different issue, I think. I think we are talking about two different things here. You mentioned the word "pathogens" and by pathogens what I think you mean is infectious organisms that are likely to cause disease. Is that what you mean?

The Hon. P. BREEN: The pathogens I am referring to are those that present a risk to humans, which is the statement that you made in June 1999.

Dr CORBETT: No, what I am talking about there in particular, and perhaps it is not obvious from the letter and for that I apologise, are possible chemical hazards emanating from volatile gases which are there as part of potential trade waste discharges. I would have to refresh my memory by looking at the REF report, but I think this was raised as a potential problem in the REF report and we were reasonably well satisfied that this was not going to be a problem.

The Hon. P. BREEN: You said earlier that any exposure of pathogens would be regarded as unacceptable.

Dr CORBETT: Yes. If I could just qualify that a little.

The Hon. JAN BURNSWOODS: We seem to be going around in circles. I understand you have just said in dealing with the volatile agents in the gases that may come from trade waste, we are not dealing with pathogens.

Dr CORBETT: That is not the use of the word that I would use.

The Hon. JAN BURNSWOODS: We seem to be at cross-purposes here.

Dr CORBETT: I would like to clarify that. If we are talking about infectious disease risk as a public health position, that is a category risk that requires risk management practices in a separate box, if you like, to those associated with chemical hazards. It is an important distinction.

The Hon. P. BREEN: Let us forget about the chemicals from trade waste for a moment. I assume you adhere to your statement that any exposure to pathogens we would regard as unacceptable?

Dr CORBETT: I think I should, again, be very careful in saying any effective exposure to pathogens. There are pathogens in the air that we breathe in any situation. What we are concerned about here is whether this vent increases the risk of exposure to those pathogens in the residents who live adjacent to these facilities. That is the critical question.

CHAIR: You are saying it will not?

Dr CORBETT: I am saying it will not.

CHAIR: Zero in risk?

Dr CORBETT: On the evidence that we have seen, we believe that there is no increase in risk. This is in many ways a familiar risk to us. We have had a sewerage system, 20,000 vents in the Sydney area venting for over 100 years. To my knowledge there are no reports of infectious diseases outbreaks associated with these vents. We are not just looking at experience here, we are looking at experience in most countries in the world, and you should be aware that the venting of the sewerage system itself has delivered vast public health benefits.

When you say has there been a study, I think when you are dealing with a system of this size, the study, in a sense, is whether we have been able to detect or note outbreaks of infectious disease which are attributable to this particular source. As I have said, there is scant reports of outbreaks of this kind and I think that is the experience of public health engineers and physicians world wide. I do not think that is too grandiose a thing to say. This method of venting sewerage systems has not been linked to outbreaks of infectious disease. I suppose that is a very important context in which we are assessing this particular proposal.

The Hon. P. BREEN: Can I put it to you that you do not know whether or not this system is likely to create pathogens in the form of aerosols, that the system is so unique, that it is so untested—on your own words, it is an eminently testable proposition—but it has not actually been tested and I put it to you that you do not know what the pathogens are likely to be that come out of this system in the form of aerosols.

Dr CORBETT: I do not think I would agree with that. I think that we know enough about this risk to be confident about our assertion about safety.

The Hon. P. BREEN: If you did not know in June last year—

Dr CORBETT: I think, again, you are not making the distinction between bacterial hazards, microbial hazards and chemical hazards. I am talking now, and the question you raised was about microbial hazards, that is a risk with which both I and my predecessors in public health have become very familiar, and we are convinced that this does not present a significant hazard to the residents who live in the vicinity of these vents.

Again, in assessing it, you say it is untested, that it is a new proposal. We do not believe it is a significantly different apparatus, a significantly different hazard than that to which we are already very familiar. There are many vents in Sydney which emit far more gas than these vents will. They are emitting gas from raw sewage and they emit it every day of the year. Some of them are in people's backyards.

The Hon. P. BREEN: I think it is fair to say that in a volume of this size with the amount of material that is in there and with the capacity of the vent at Scotts Creek, on your own words, the amount of pathogens coming out of that system, although they may be safe, you kept saying and you said it four times, I think, that it was an eminently testable proposition. What I am putting to you—

Dr CORBETT: Could I just clarify that. What I said was an eminently testable proposition. What I said was that the generation of aerosols from those vents which has been raised as a potential pathogenic mechanism, aerosols laden with bacteria being transmitted from the vent and inhaled by people who live in the vicinity. That is a potential route of exposure.

Our view is that, whilst unlikely, the generation of aerosols is an eminently testable proposition because it is our strong view that if there is not a sufficient generation of aerosols, that would be further proof for us that the transmission of disease would be even less likely. Without aerosols you are not going to get the transmission of bugs and that is why we are suggesting that a middle course may be to test the proposition which has been raised that these aerosols are emitted from these vents.

CHAIR: Can you explain why you did not attend the mediation briefing session on 6 October, 1999?

Dr CORBETT: I am sure it was because there was a competing priority, but I cannot tell you exactly what it was at the time. I attended all of the briefing sessions that I was able to, but I can probably find out for you in retrospect. It has only been raised with me today.

The Hon. J. H. JOBLING: You made much of the comparison between the standard vents that exist on the raw sewage system at the moment, which are obviously a low pressure, versus the venting that will occur from Scotts Creek, which obviously will be of a different nature and of a much greater volume.

Dr CORBETT: I am not sure that that is true, sir.

The Hon. J. H. JOBLING: What you have now said to us a moment ago is that there are a number of other ordinary vents around Sydney, some in backyards, that will have a greater volume of emission than may well happen at Scotts Creek vent throughout a major episode.

The Hon. JAN BURNSWOODS: I do not think he actually said that.

The Hon. J. H. JOBLING: Thank you. I am sure he can answer his own questions.

The Hon. JAN BURNSWOODS: There is not much point in using words that have not actually been used.

The Hon. J. H. JOBLING: The witness, I am sure, is competent.

The Hon. JAN BURNSWOODS: I am actually waiting to get on to the other witness.

The Hon. J. H. JOBLING: I am sure the witness is competent to answer it.

The Hon. JAN BURNSWOODS: Yes, but there is not much point in wasting time.

The Hon. J. H. JOBLING: Would you care to name such areas, please?

Dr CORBETT: I think that is actually a question you should direct to Sydney Water.

The Hon. J. H. JOBLING: Well, you made the statement.

Dr CORBETT: Certainly, and we have seen evidence simply of emission velocities and volumes of gas emitted from a number of tunnels. We have asked Sydney Water directly. The only one that I can recall from memory is the chimney at Bondi associated with Bondi Sewage Treatment Plant.

The Hon. J. H. JOBLING: That is hardly in somebody's backyard.

Dr CORBETT: Of course it is not. I am just saying that my understanding is that there are a number of vents that emit volumes of gas from raw sewage which are in excess of what will come out of this vent. That is my understanding on the information that I have seen.

The Hon. J. H. JOBLING: There may be, in other words.

Dr CORBETT: No, I have been assured that that is the case by Sydney Water.

The Hon. JAN BURNSWOODS: You are putting words in his mouth.

The Hon. J. H. JOBLING: I will thank the honourable member to ask her own questions.

CHAIR: Can you pinpoint one?

Dr CORBETT: This Bondi one.

The Hon. J. H. JOBLING: The Bondi one is a public one that is on the North Bondi golf course. That is the one you are referring to?

Dr CORBETT: That is the one, yes.

The Hon. J. H. JOBLING: But that is a sewer outfall, is it not?

Dr CORBETT: Sure. Look, I have a memory of what the volume of gas escaping from that vent is. I would have to check the figures before I quoted them to you in this context, but my memory is that it is 10 to 20 times higher, and it occurs every day of the year.

The Hon. J. H. JOBLING: I would not be surprised to find that in that particular vent. That is very different from the normal green one-kilometre-apart vent that you find throughout residential areas.

Dr CORBETT: There are some very large vents in some parts of Sydney and—

The Hon. JAN BURNSWOODS: The heritage one in Marrickville.

Dr CORBETT: That is right. There are a number around the city and, of course, I cannot quote you chapter and verse how much gas they emit. I am assured—and, what is more, this was an issue about which we questioned Sydney Water closely—that there are a number of vents of equal or greater magnitude of emission than this particular vent.

The Hon. J. H. JOBLING: On the basis of illegal trade waste and toxic waste, which unfortunately does find its way into the sewerage system, how did the Health Department consider that potential risk? What steps did you take to determine, other than being simply told by Sydney Water that it was no problem? What other steps did you as a Health Department take to satisfy yourself that the potential risk was small?

Dr CORBETT: I don't recall exactly what steps we went through. My memory is that we read the REF report. I have a memory of questioning at some stage people from Sydney Water about some levels of chemical contaminants in sewage, at what level they occurred on average, and I remember looking at a table that contained some of that information. I do not recall if it was in the REF report or not, but I remember having seen some information about average levels of chemical contaminants in sewage, and it was on that basis that I was reassured that the possibility of chemical exposure in residences adjacent to these facilities was not great.

The Hon. J. H. JOBLING: Would it be possible, then, to reassure the Committee, and I accept that it may have been some time ago, that when you leave us this afternoon you could supply us tomorrow with some details of that?

Dr CORBETT: I think that would be possible, yes.

The Hon. J. H. JOBLING: Could you also now tell me what steps you took to test the question relating to the flushing of the tunnel? What did the Health Department do, who did it consult and how did you determine that the flushing of the tunnel after the storage of either an episodic downpour or the need to store raw sewage in the tunnel would be satisfactory and it would be satisfactorily flushed?

Dr CORBETT: Well, there are two potential hazards there again. When you say it is flushed, our job was to assess the potential hazard. Now, what hazard would contend on that scenario? That would have been our job, to ascertain what that would be. And the question we put to Sydney Water was: under the most adverse circumstance what are the potential hazards associated with these vents?

Now, the information that we have is that the storage area would be filled at times of high rainfall, that after a certain period of time the air will be expelled through these vents to stop the build-up of pressure, and the hazards that we assessed in that context were the ones that we have been talking about here today, which is chemical hazards and, in the main, the one that we are interested in is hydrogen sulphide and microbial hazards which we have been discussing today, so in a sense they do not differ from the risks that we have been talking about.

But as far as the storage of raw sewage in this tunnel is concerned, my understanding is that, in the main, the hazards that are associated with these vents are in situations of high rainfall where the overflows will occur, the microbial hazards. The overflows will occur in this tunnel and that is when the aerosols will be generated. I do not believe in the other situation where raw sewage is stored that aerosol generation, which is the main vehicle for a potential hazard, will occur in the vicinity of these tunnels. That is my understanding.

The Hon. J. H. JOBLING: Before I put the next question, which I would like to put to Professor Kerr—

The Hon. JAN BURNSWOODS: Could I just clarify that because that was the question I was asking the Chair? I have a couple of questions which I would have liked to have addressed to Professor Kerr but I am not sure whether we are trying to deal with Dr Corbett first and then deal with Professor Kerr. Can you just tell us how we are actually going to do it?

CHAIR: I think Professor Kerr will have the opportunity in just one or two moments to answer some questions.

The Hon. JAN BURNSWOODS: Because I do not want us to go over all of the same ground with identical questions.

The Hon. J. H. JOBLING: My response to that, Chairman, with respect to my colleague, is that we have two independent persons, both of whom are experts in their fields, and they may or may not have the same answer to the same questions.

The Hon. JAN BURNSWOODS: No, I know that, but I wonder if we are going to give Professor Kerr a chance to deal with these ones we have already dealt with or whether we are going to basically do the whole thing again.

CHAIR: I hope we will be able to after the question to be asked by Mr Jobling..

The Hon. J. H. JOBLING: The question I would like to ask of both of the witnesses, which opens the door I think to what is there, but firstly to the person to whom I have been putting the questions, to Dr Corbett—

The Hon. JAN BURNSWOODS: I wanted to ask a question about floods. Are we going to come back to that?

CHAIR: We are going to come back altogether for another hearing if we do not get this over quickly, so let us just proceed, shall we?

The Hon. J. H. JOBLING: Dr Corbett, what I wanted to know was what the New South Wales Health Department understood or determined by the term flushing of the tunnel to prevent growth of pathogens and then after that I would then like to turn to Professor Kerr and put a similar question to him.

The Hon. JAN BURNSWOODS: But we want to ask Professor Kerr questions that have already been asked of Dr Corbett. I just want some understanding of how we are to proceed.

The Hon. J. H. JOBLING: If you would stop interrupting.

The Hon. J. F. RYAN: Ask them.

The Hon. JAN BURNSWOODS: We have not been able to get a word in. The Chairman just told me 10 minutes ago that he was going to move on to Professor Kerr. I think that would be very sensible.

CHAIR: Let us allow our witness to answer that question.

Dr CORBETT: I have a one-line answer to that question, if that will do. My understanding is that under dry weather conditions there is a capability to flush the tunnel.

The Hon. J. F. RYAN: With what?

Dr CORBETT: With sewage, I presume.

The Hon. J. H. JOBLING: In dry weather conditions?

Dr CORBETT: In dry weather conditions it would have to be with water. It cannot be sea water. That is the one thing I recall.

The Hon. J. F. RYAN: Can I just say that one of the problems that I have got with the general report that you have given—and I think this is something that the community have asked—is that, by and large, the stuff that we get from the Department of Health in terms of opinion amounts to two or three A4 sheets on which they get statements like "It is the opinion of expert microbiologists"—we do not get them named—and "studies of communities immediately adjacent to sewage treatment

have shown", and we do not have those named yet at the same time have you had a chance to read Dr Kearney's report and comment on it in detail.

You say you put together a panel, but there appears to be no written material from that panel that has been submitted to anybody, least of which the community, not less this Committee. We simply have to take it on trust that you have done your homework, that you fully understand the operations of the tunnel, which I think even the evidence you have given here indicates that occasionally you have at least got to check the detail.

We do not seem to have anything in which you have committed yourself in detailed writing to which we can refer, other than, as I have said, documents amounting to probably less than 2,000 words in which there are reasonably general statements made. For example, in terms of those studies, are you referring to the studies which are appended to one of the consultant's reports, all of which appear to date back to the 1980s?

Dr CORBETT: Which studies are you referring to?

The Hon. J. F. RYAN: There is an appendix to a submission from the Water Board. It is called "Appendix L, Odour and Corrosion Technology Consultants Incorporated J. Joyce, Health Effects Of Exposure To Raw Waste Water Aerosols 1999, Review Of Selected Literature", and then when I go into the report all of the dates of the literature reviewed are 1981, 1980, 1980, 1980, 1980, and I think one goes back to 1960.

The Hon. J. H. JOBLING: Which is pretty old.

The Hon. J. F. RYAN: It appears to be reasonably old. You do not seem to have provided the sort of documentation which consultants supply. We just get a one page A4 sheet, a kiss-off, you know, "We in the Department of Health are satisfied". The community is saying they feel that they have done their homework better because they have to supply you with chapter and verse where they are getting their information from and detail their understanding but you are able to sort of say, "Well, we are satisfied", but provide no written detail as to exactly what is your understanding of the operation of the tunnel, what are the documents on which you are basing your opinion, what is that research on which your opinion is based, when were these panels convened, was that available to the public.

Dr CORBETT: I am happy to do it. As public officials, we are asked to write opinions, we are asked to write submissions to inquiries such as this. Generally speaking, these are not referenced academic works. They are opinions which we garner from wherever we can at the time. I am unfamiliar with the tradition of having to provide referenced documents, but we are certainly happy to provide them.

The Hon. J. F. RYAN: Well, I guess the public are interested as to whether—have you written a report—

Dr CORBETT: Sorry, I do not quite know what you are saying. Are you saying if you are able to assert that our opinions are poorly researched, then I have not seen any evidence that actually—

The Hon. J. F. RYAN: I am not saying that.

Dr CORBETT: Well, that seems to be the implication.

The Hon. J. F. RYAN: Your opinions are not open for scrutiny in the same way that everybody else's are.

Dr CORBETT: We have provided a submission.

The Hon. J. F. RYAN: Three pages. This is your submission, sir. It is three pages. And one of them is a letter.

Dr CORBETT: Brief and to the point is what I would say, and I think it has distilled our view.

The Hon. J. F. RYAN: But how do we check a statement like "Studies show"? We do not know what the studies are.

Dr CORBETT: I am happy to provide you with references.

The Hon. J. F. RYAN: "It is the opinion of experts". Which microbiologists are you referring to?

Dr CORBETT: The names of two microbiologists who were submitted to the inquiry as being commended to the inquiry I think in the letter that accompanied that report—Dr Lyn Gilbert and Dr Dominic Dwyer from Westmead Hospital, the ICPMR [Institute of Clinical Pathology and Medical Research]—were commended to the inquiry as experts who sat on that committee.

We did not supply an exhaustive list of references to back our opinion, but I would certainly be willing to do so if it was seen to be necessary. We would not in any way resile from the view that is put in that report that this is a consensus of scientific opinion about the nature of this risk. If you are asserting that it is not a consensus—and what, I guess, the community is asserting is that they question that consensus—we would be very happy to expose that to review, but we are confident that that is an expression of scientific consensus.

Now, I have to say that on this particular matter I am confident that the consensus is much stronger than it is about many other issues which we deal with. If you were to look at the Health Department's submission about issues such as the health effects of aircraft noise or other issues, it often goes into much more exhaustive detail about the nature of the hazard. It is just in this case I think, to be honest, the brevity of the correspondence reflects to a certain extent the confidence of our opinions.

The Hon. J. H. JOBLING: You will supply that to us?

Dr CORBETT: Supply what to you?

The Hon. J. H. JOBLING: A bibliography of the detail of your experts and the statements upon which you have drawn your conclusions.

Dr CORBETT: Sorry, I just need to be a little bit more specific about what, about the nature of which hazards in particular, because it is a bit open-ended as it is at the present time.

The Hon. J. F. RYAN: Well, no. Where is the written detail of these panels of experts that you put together who considered this report? We do not know if they even know how the tunnel operated, yet that has been an area of issue. How did you go about assembling your advice?

Dr CORBETT: I think you should understand that the Health Department is often called upon to make decisions about public health risks in a whole range of different contexts. A conventional approach to doing that is to convene experts upon whom we rely to provide independent advice about the nature of hazards. The Chief Health Officer, Dr Andrew Wilson, convened a group last week at which—

The Hon. J. F. RYAN: What about for the REF?

Dr CORBETT: Yes, it was convened last week because of the contentiousness of the issues that have been raised. At that meeting a working model of the tunnel was exhibited.

The Hon. J. H. JOBLING: This was the tubular one that water runs up and down, was it?

Dr CORBETT: I guess it is the same one, yes.

The Hon. J. F. RYAN: At the end of the meeting the experts left giving you written advice, oral advice?

Dr CORBETT: A discussion was had about the nature of the hazard and, as I said, the main outcome of the meeting in terms of action was a proposal to test the proposition that aerosols can be generated from these vents because our assertion was and the opinion of the experts there was that if there were no aerosols generated, there would be no hazard. It was as simple as that.

The Hon. J. F. RYAN: Are there minutes of this meeting?

Dr CORBETT: No. It was a meeting of—I am unaware. I think actually—I would have to get back to you about that. I am not sure.

The Hon. J. F. RYAN: How does the public scrutinise—

Dr CORBETT: Well, it was not a public meeting.

The Hon. J. F. RYAN: You are making a decision about an issue that affects the public.

Dr CORBETT: We do it every day.

The Hon. J. F. RYAN: I do not deny that. Every aspect of this has been able to be reduced to writing for the public to scrutinise, just as you were able to scrutinise Dr Kearney's report. I still do not know the names of these two experts, where they met, when they met, what they said or what they knew.

Dr CORBETT: It is the first time we have ever received a request. We would be happy to provide that.

The Hon. J. F. RYAN: Why would that not be provided as a matter of course? The whole issue of this is about trust, sir.

Dr CORBETT: Yes, of course.

The Hon. J. F. RYAN: One of the ways in which this might have developed more trust is if not only had the experts chosen by the Department of Health been present but certainly had the experts that the community has some reliance on been present at the same meeting and been able to see the process go forward and conduct some sort of peer review of that process, they might have been in a position to go to the community and say, "Look, there is nothing in writing, but we were at least confident that the process that the Department of Health went through was rigorous." All they have as evidence and all we have as evidence is your written letter, "We conducted a process"—no names but "studies exist"—no detail, and that "We held a meeting." We have no idea how long it was, how rigorous the briefing from Sydney Water was, whether the questioning by these people was detailed or rigorous of Sydney Water.

Dr CORBETT: May I remind the honourable member that the New South Wales Health Department was never formally invited until the mediation. We were bypassed in the deliberations that occurred in the development of this—

CHAIR: You were bypassed?

Dr CORBETT: Excuse me, could I just finish, please? I was invited on the expert panel as an expert professional in this area, not as a representative of New South Wales Health. As it happened, I was invited to attend that panel. The normal process of approving a development would be that the development application comes to us and we make a professional assessment of that. We provide that in writing. That is a formal part of the development process.

Now, if there are community concerns, we do get involved. We meet with community members. We elicit their concerns. We substantiate their concerns, if that is required. That did not happen in this process, so you are searching for documentation of a process which, by and large, did not occur. We were called to a mediation session. I gave my views and I was called to that as a professional public health physician, not as a representative of New South Wales Health and our

subsequent involvement has come about as a result of this inquiry. We are very happy to open up our files about the deliberations that occurred as a result of this. We have nothing to hide here.

The Hon. J. F. RYAN: But there are no files to open up.

Dr CORBETT: We have voluminous files on this matter and they have not been formally requested. If you want to see the documentation we have, you are welcome to it.

The Hon. J. F. RYAN: This meeting you referred to occurred last week, you said?

Dr CORBETT: That meeting arose specifically because what had arisen as a result of the potential for this inquiry was the unresolved issues raised in this correspondence about the hazards of Legionnaire's disease and the hazards of hydrogen sulphide. The specific issue and focus on the problems of Legionella were raised with me. The first I had encountered this as a problem was when I met with Mr Kaye. We answered his correspondence, we met with Mr Kaye.

I heard about his concerns about Legionella. I took them very seriously and I urged the department to convene this expert group in response to those concerns to resolve a scientific matter which had previously not been resolved. Prior to that meeting with Mr Kaye, the issue of Legionella had not been raised in any of the prior correspondence, nor did we raise it as a potential concern because it had never arisen.

The Hon. J. F. RYAN: Was Mr Kaye present?

The Hon. JAN BURNSWOODS: On a point of order. We have now been going for over an hour. We have now run out of the time allocated for both Professor Kerr and Dr Corbett. We are now repeating, I think, for the fifth time—my apologies, Dr Corbett, you have said all of this before and I know you are being forced to by the nature of the questions. You said to us at least one hour ago and the transcript will show this that the meeting last week was because the issue of Legionella and so on had been raised.

I have been trying, I think, for the last 25 minutes to find out from you, Mr Chair, whether we are going to have a chance to hear from Professor Kerr who was set down to finish with Dr Corbett at 3.15. Please, Mr Chair, I beg of your to give us some guidance as to what we are going to do, whether we can get away from this ludicrous round and round in the same circle, trying to invent issues that do not exist with poor Dr Corbett having to tell us for the fifth time that the group that met last week met because the issue of Legionella had been raised. Now, I do not know how many times we need to do this when—

CHAIR: We will have another hearing.

The Hon. JAN BURNSWOODS: I have sought your guidance since ten to three. You are the Chair of the Committee. It is up to you to tell everyone here how we are going to proceed.

CHAIR: The point is that we have had some very revealing evidence from Dr Corbett that they were bypassed in the whole process until very lately and that is very important and significant evidence. I allowed the questioning of Dr Corbett to continue for longer than expected because his evidence was very interesting to the members and certainly to the Chair and other people here. But now I think it is time to go on to Professor Kerr. I would suggest that honourable members ask Professor Kerr questions who came here to especially give evidence.

The Hon. JAN BURNSWOODS: Could I suggest that perhaps Mr Manson goes first because this side of the table has had no chance to ask many questions.

The Hon. A. B. MANSON: Professor Kerr, at last I am going to ask you a question. Do you consider that Legionella will be an issue with this vent?

Professor KERR: I have always regarded it as a potential hazard but we do not have enough information to answer that question, but the circumstances of finding out the information for practical purposes, I think, have been addressed by Dr Corbett.

CHAIR: Could you quantify the hazard?

Professor KERR: No, it is totally impossible in this situation. We do not have enough evidence. This is an extension of a public utility. To quantify things you would have to set it up as an experiment which would take ages and be very complex.

CHAIR: In your letter to Mrs Rowan, chairperson of the school council, you do talk about a possible infectious hazard and you talk about the question of flushing. Are you aware of how the tunnel will now be flushed?

Professor KERR: Yes, I am. Three main ways, or four, really. The storm flow, of course, will flush it. The use of raw sewage to move gravel would effectively flush it. There is seepage into the tunnel from groundwater and then it is also graded down towards North Head. I was only considering this in the context of removing any stagnant formation of water pools because that is the environment favoured by Legionella.

CHAIR: Can Legionella breed in droplets of water in the tunnel which is not flushed on the roof, on the sides?

Professor KERR: If it were stagnant enough to produce biofilms, that is, other organisms and slime organisms, then it could, yes.

CHAIR: If the tunnel were to fill rapidly and the air were vented very fast and the filtration system was bypassed, would it possible for Legionella to be vented into the air at Scotts Creek?

Professor KERR: It is possible, but unlikely. The environment is still hostile for these organisms to flourish. Unless there is this business of aerosol transport, it would be very unlikely to get out in a way to be exposed to people and cause them harm.

The Hon. J. H. JOBLING: Professor, the tunnel is six metres approximately in diameter. When you talk of flushing the tunnel, if under two conditions, first, the normal inflow episode of high rainfall and dilute sewage and, second, because of the plant failure it has to be filled solely with raw sewage, to what height after either of these incidents would you expect the flushing of a tunnel to occur?

Professor KERR: I cannot answer that question because I was really concerned with stagnant water on the floor of the tunnel and I felt there would be sufficient movement in the tunnel to prevent that happening.

The Hon. J. H. JOBLING: But in the event that the volume of whatever it was that was contained in the tunnel with its other impurities which filled the tunnel 95 per cent of the way up the tunnel, it would seem from what you have said that most of the tunnel, therefore, might well not be flushed. The bottom bit is but from about two feet, three feet up there would actually be no means of flushing it.

Professor KERR: No, but I could not really see how stagnant pools could collect on the walls or ceiling of a tunnel.

The Hon. J. H. JOBLING: Could I put to you the proposition of other impurities in sewage may well adhere to the sandstone, and just as you see trees growing out of sandstone cliffs, there would be a medium there which might almost be agar-like to grow things.

Professor KERR: It is possible. You are dealing with an ubiquitous organism.

The Hon. JAN BURNSWOODS: By the same token that would happen in any sewerage pipe in the Sydney system.

The Hon. J. H. RYAN: Most sewerage pipes are not sandstone and six metres in diameter.

The Hon. JAN BURNSWOODS: But they are not completely flushed either unless in an incredibly rare event, so the sort of issues being raised would apply throughout the existing system.

The Hon. J. F. RYAN: No.

The Hon. A. B. MANSON: Professor Kerr, will there be any improvement in terms of health with the vent at Scotts Creek from the overflow that exists there now?

Professor KERR: Well, the frequency of flushing events into surrounding creek and run-off areas will be reduced. In that sense there would be an improvement, yes.

The Hon. J. H. JOBLING: Professor Kerr, following up, as somebody who is an expert in the field of this storage tunnel, can you tell us whether you have actually examined or seen or have knowledge of where a similar tunnel exists with a similar venting system as occurs with the filtering system that is proposed at Scotts Creek?

Professor KERR: No, I am unaware of that. Most of these problems are site specific. Even if it did exist, we would have to look at the precise situation for this area.

CHAIR: Professor Kerr, just a quick one. Dr Corbett suggested that it is likely that the proposed filters for the Scotts Creek vent will capture aerosol particles, despite the fact that this is not the primary purpose of these filters. Dr Corbett further seems to suggest that this will assist to reduce the level of pathogens expelled from the vent. However, he indicated that his view in this regard has not been tested. Do you have any relevant experience to either substantiate or refute Dr Corbett's view? Do you concur with Dr Corbett's view?

Professor KERR: In general, yes, but I still would not accept that the filters would obstruct all pathogenic organisms from getting through, which I think is the main issue.

The Hon. P. BREEN: Professor Kearney came to a different conclusion from Dr Corbett. In his evidence, Dr Corbett said that he had a very different perception from Professor Kearney as to the number of days the tunnel would be empty. Do you have an understanding about the number of days the tunnel will be empty?

Professor KERR: Yes. I understand how many days the tunnel will be full. I have not really thought of it in terms of being empty, because I do not know how long it will take to drain away. But I think it is quite clearly expressed in the materials.

The Hon. P. BREEN: Yes, it is perhaps 340 days is my understanding that it will be empty. What I would like to know, though, is just how empty it will be. Evidence we heard earlier from other people in the community groups suggested that there would always be waist-high water at least at the North Head end of the tunnel. Is that correct?

Professor KERR: I had assumed that it would be relatively empty, but I am afraid that I am not an expert in its volume flows.

The Hon. P. BREEN: If that information is correct, that there will be waist-high water at the North Head end of it, is that likely to be a breeding environment for Legionella?

Professor KERR: Not unless there was no flow, and I understand the gradient would always permit a significant volume of water not to be stagnant, to have movement in it.

CHAIR: We are running out of time now. One more question.

The Hon. J. F. RYAN: We were talking earlier, Dr Corbett, about a meeting that you convened to respond to some issues raised by a person called Ralph Kaye. Was Ralph Kaye invited to attend the meeting?

Dr CORBETT: No, he was not.

The Hon. J. F. RYAN: Would it not have been a good idea to do that?

Dr CORBETT: This was a meeting convened specifically to elicit the opinion of our invited microbiological experts, to gain some understanding, to give them some understanding of the question which lay before us. I believed that I had in my discussions with Mr Kaye and his correspondence understood his concerns. The meeting was convened by the Chief Health Officer, as I have said, and it was really for him to decide who should be at that meeting. It was not a meeting that was going to be a public meeting or open to the public; it was an expert panel which we convened with a specific purpose.

The Hon. J. F. RYAN: Were you present?

Dr CORBETT: Yes, I was.

The Hon. J. F. RYAN: Were there officials from Sydney Water present?

Dr CORBETT: Yes, they were.

The Hon. J. F. RYAN: And were they present during the entire meeting, including during the time at which you were making your decision?

Dr CORBETT: I think you should understand that it was an information meeting; it was not a decision-making meeting.

The Hon. J. F. RYAN: So was the decision made at the time that Sydney Water was not present?

Dr CORBETT: What decision are you referring to?

The Hon. J. F. RYAN: Well, whatever action you decided that came from that meeting?

Dr CORBETT: A discussion was had about the technical proposition about aerosol formation that I discussed earlier. That was the main outcome of the meeting. It was an information session to inform our experts about the nature of the hazard and for those experts to advise us about a course of action.

The Hon. J. F. RYAN: Do I understand that the only hazard that was discussed at that meeting was the issue of Legionella, or were there others?

Dr CORBETT: The issue of hydrogen sulphide was also discussed.

CHAIR: Thank you very much, Professor, and Doctor, for your patience.

(The witnesses withdrew)

ROBERT ERNEST WILSON, Consultant, 202 Doncaster Avenue, Kensington, and

IAN BRUCE KIERNAN, Executive Chairman, Clean Up Australia, and Independent Member, Waterways Advisory Panel, 18 Bridge Road, Glebe, affirmed and examined:

CHAIR: Mr Wilson, in what capacity are you appearing before the Committee?

Mr WILSON: As a member of the Waterways Advisory Panel.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr WILSON: Yes, I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr WILSON: Yes, I am.

CHAIR: Mr Kiernan, in what capacity are you appearing before the Committee?

Mr KIERNAN: As an independent member of the Waterways Advisory Panel.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr KIERNAN: Yes, I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr KIERNAN: Yes, I am

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you have a statement that you wish to make first?

Mr WILSON: Yes, Mr Chairman, I would like to just go through a brief outline of our processes and procedures and then Mr Kiernan will summarise our attitude to those processes. We asked, ourselves, to appear before this inquiry because of the knowledge that we have that has occurred at Scotts Creek and we believe will give a different perspective from the protesters and Sydney Water to the views they have given. As I said, I want to describe the processes we went through during the consultation that was conducted by the Waterways Advisory Panel, and then Ian will sum up.

The original Sydney Water proposal, the one that was approved in 1997, was only endorsed by the Waterways Advisory Panel with the proviso that mitigation of certain major overflows were included in the original tunnel scheme. Those overflows were at Tarban Creek and Scotts Creek. At the time, the community throughout the consultation process indicated a high concern about pollution and health issues related to the overflows at these two sites.

The Scotts Creek overflow was only 20 metres from a school and it was cascading into a valley when in operation, and that was of concern to the community and to the Waterways Advisory Panel at that time. The Government agreed to the extension of the tunnel to take in both of those sites, and I suppose we thought that was the end of it, but Ian and I became concerned when the approval started to be implemented and the public thought they had been duped by Sydney Water.

It was our view that the public were concerned about Sydney Water and the way it was breaking, in their view, promises, so we wrote to the Government and said we thought there needed to be an independent look at the issues that were causing concern.

The Government reconstituted the Waterways Advisory Panel, and Ian and I were appointed to that. Because of the mistrust that seemed to be present in the community, we decided not to go to Sydney Water initially but to go to various public meetings and community groups and find out what their views were and then to seek some independent comment on that.

When we went to those groups we asked them to state all of their problems and we actually prompted them to speak about air quality. It was only at Scotts Creek that anyone expressed concern. There was a bit of concern about dust at Lane Cove. I pursued the thing quite aggressively with the people at Manly because I know the concerns they have had, but at that stage they were not concerned about the air quality issue.

It was only when we had a public meeting right at the end of the inquiry that a Lane Cove resident raised concern about air quality. At that meeting he was satisfied with the answers given to him in the meeting and afterwards by the Department of Urban Affairs and Planning.

When the Waterways Advisory Panel commenced, the Scotts Creek action group had already entered into a mediation process. We were not part of that process and we were asked by the mediator not to intervene in that process so we never became part of that process though I attended a couple of meetings. Nevertheless, we sought independent advice on Scotts Creek, making sure that we did not intervene and deflect a process that at that stage both parties were trying to make work.

We took submissions and reports from both the Department of Urban Affairs and Planning and from the Scotts Creek group. The report that we received from the Department of Urban Affairs and Planning was prepared by AWN—that is, Air Water Noise Consultants—and that report was reconciled against a report done by the consultants to Willoughby Council.

It is our understanding that the Department of Urban Affairs and Planning worked with the two consultants to reconcile those two reports and that that occurred. Nevertheless, the Waterways Advisory Panel asked a series of questions about the report prepared by Air Water Noise Consultants, and they related to the fact whether H_2S, hydrogen sulphide, is an odour problem and only an indicator of that and not an indicator of health.

We asked about the constituents in the sewage flow, whether there were volatile substances being discharged into the sewerage system, and the effectiveness of the trade waste program of Sydney Water. We pursued issues about the raw sewage impacts on the tunnel and whether in case of a breakdown at North Head there would be raw sewage discharging back into the tunnel.

We were concerned about the power capacity to expel stored waters from the tunnel and to operate the fans at the various gas outlet points. We looked at the effectiveness of the filters and the precautions about bypassing filters. We asked questions about the destination of low molecular weight compounds and about microbiological growth on the filters and about the formation of aerosols post the filters.

All of these questions were sent to the Department of Urban Affairs and Planning and over a series of meetings with them we discussed those questions. In the end, the panel was satisfied that there were sufficient precautions in place to overcome the concerns that we were expressing. Some of those concerns were ones we picked up through the community consultation process.

The Department of Urban Affairs and Planning then provided a summary of the risks, and that you would have in your final report. As an added precaution, we spoke to the Department of Health. They had seen the Department of Urban Affairs and Planning summary. Their view was that the Department of Urban Affairs and Planning was extremely cautious, that the ambient and everyday conditions in the environment did not reach the extreme standards that were going to be provided at the discharge point of the vent and that the risks were much better than the normal risks that one has in the community.

It was the view of the Department of Health that the public had nothing to worry about. We thus came to the conclusion that the local environment was not at risk but was actually improved by removing the spray from a frequently overflowing sewage discharge. I believe if you examined the area you would see that the bushland exhibits signs of that pollution discharging.

The weed growth in that area is much greater than any of the other weed growth in the general vicinity of the whole bushland. We believe that the right decision has been taken to vent at Scotts Creek and to remove a serious overflow from that valley. I will now pass over to Mr Kiernan.

Mr KIERNAN: In the first instance, with the initial Waterways Advisory Panel, I elected to join that because I saw it was an opportunity to play a role in the improvement of the serious problem of sewage overflows into Sydney Harbour. As Bob has said, at that time, it was not intended that Scotts Creek and Tarban Creek would be included. That was one of our recommendations and it was accepted. As Bob has said, the problems of overflow there on a regular basis were severe, with raw sewage essentially passing right through that park and passing in close proximity to the school.

Through the process of that first Waterways Advisory Panel, we reviewed a number of submissions and in the end we accepted that Sydney Water's was the most effective because of the number of promises that had been made to us. The fact that those promises were gutted out of the project as it proceeded caused us deep concern. I personally felt deeply compromised, and I felt that my credibility had been affected through this irresponsible action. If we had known that these things were to be gutted out of the original accepted proposal, there is no way we would have recommended it.

We made in that first Waterways Advisory Panel certain recommendations and, I have to say, we were most thorough in how we arrived at those recommendations and they were all accepted. Then when we saw what was happening with the removal of a number of largely environmental assurances, seeing them removed, we started to complain about that and the second Waterways Advisory Panel was put in place. Again, I joined that as an independent member.

I am fully conscious of the fact that there is no point in fixing one problem and creating another. I support the precautionary principle. We went to a great deal of trouble through public consultation by consultation with experts to assure ourselves that by fixing the raw overflows into Scotts Creek, we were not creating another problem in relation to the aerosols.

The fact that at Bob's recommendation we not only accepted the very thorough report of DUAP, but we then sought additional assurance from the Department of Health meant that our recommendation was that the recommendation be accepted. It has been a very difficult process and it has been very much kaleidoscopic in that it has changed all the way through.

But I have to make the point very strongly that there is no point in transferring the discharge from Scotts Creek to Manly because we believe that it does not create a health problem but it is going to create great angst within the Manly community if that is to happen and we could see that there were huge costs involved which could affect priorities of other problems that we want addressed around Sydney Harbour and the Sydney catchment. We want to maintain attention to those priorities.

So, we have presented our report as independent members of the committee, laid it squarely there and it is now a matter of what action the Government takes and what action is taken by the Alliance to address the problems.

The Hon. J. R. JOHNSON: Gentlemen, the Waterways Advisory Panel supported the tunnel in 1999. Did you arrive at your conclusion solely on information from Sydney Water in reaching your conclusions?

Mr WILSON: We kept away as much as we could from Sydney Water. They were banging on the door wanting to give us advice, of course, but we attempted on all occasions to go to other sources of advice. We did ask Sydney Water a lot of questions and they responded to those questions, great volumes of stuff in answer. They did give us an early submission, but we were determined to go down an independent path and not be swayed at all by that early submission from Sydney Water, and I am speaking for all members of the panel, not just Ian and myself.

The Hon. A. B. MANSON: You have looked at the Scotts Creek vent and consulted with the community on this issue. Are you convinced that the vent is safe and why?

Mr KIERNAN: Given the thoroughness the DUAP report and the fact that we did not just accept that at face value but we went further to get concrete assurances by the Department of Health, my answer is yes.

CHAIR: In your report on page 58, you recommend that Sydney Water pursue the option of an additional microfilter hospital grade for the extension of the exhaust vent duct away from the site, increasing the buffer zone 200 metres. Are you aware that neither of these options have been adopted?

Mr WILSON: No, we are not. We thought that they had negotiated a position where they would take on one of those options. As Ian said, it was always our position that neither of those options were necessary, given the risk studies done by the Department of Urban Affairs and Planning and the Department of Health. We were more attracted to the option of increasing the height of the stack to penetrate the air zone.

CHAIR: Are you aware that that has not been done either?

Mr WILSON: No, I am not.

CHAIR: Also you asked in your report that the existing green sewerage pipe be removed. Are you aware that that is not happening either?

Mr WILSON: No, we are not.

CHAIR: Are you aware that of the 11 options talked about in the various community discussions, Sydney Water chose the least acceptable option to the community? There were various options for removing the pipe, for increasing the vent stack, 11 options in total in the Sydney Water submission and the least acceptable option was chosen by Sydney Water. Were you aware of that?

Mr WILSON: No, we were not. We were aware of the two options you mentioned and the one I mentioned, but you must remember we could not intervene in the mediation process and if they were done during the mediation process, we were not privy to all that was going on there.

CHAIR: The Department of Health had a meeting last week to discuss the possible problem of Legionella emissions and there is some suggestion that it is possible for Legionella to actually breed in the pipe and possibly in the activated carbon. Was that problem ever discussed with you by the Department of Health or anyone else?

Mr WILSON: No, it was not.

The Hon. J. F. RYAN: A couple of questions about your report, gentlemen. On page 57, you make specific comments about the Scotts Creek and Lane Cove West vents. You say, "The panel is convinced that with the controls imposed by the Minister, the Scotts Creek vent will work effectively." Then you say, "The filtering system to be used in the vent employs the same protective mechanisms that are used in laboratories for filtering infectious organisms." I am aware that the filtering material has nothing to do with filtering infectious organisms. It has entirely to do with filtering chemicals. Were you aware of that?

Mr WILSON: Our advice from DUAP was that that filtering system was used in filtering mechanisms. You remember the first of the questions I asked, I asked about the difference between odours and health-related issues?

The Hon. J. F. RYAN: Yes. As I understand it, the filtering mechanism is essentially an activated carbon filter. It is primarily designed to remove hydrogen sulphide and other chemicals. It may, as a matter of happenstance, provide some means of a barrier but it is not designed to be a barrier, as I understand it, for organic pathogens.

Mr KIERNAN: I am not a scientist. It was always my understanding that activated carbon is effective in collecting microorganisms. That is why you have activated carbon in your water system under the sink, filter system. That is probably a better question for a scientist.

The Hon. J. F. RYAN: No one has given us evidence that this filter is effective for filtering infectious microorganisms. I was trying to find out where you people got it from?

Mr WILSON: We got it from DUAP.

Mr KIERNAN: And that was reinforced by the opinion of the Department of Health.

The Hon. J. F. RYAN: Are you aware that the opinion of the Department of Health basically amounts to a single, three-paragraph letter by Dr Stephen Corbett to an official of the Department of Urban Affairs and Planning, Mr Wild. That appears to be the sole written material provided by the Department of Health. It is a single-page letter by Dr Stephen Corbett, Manager. It is dated 7 July and it would appear that the Urban Affairs and Planning report largely just quotes that. Is that your knowledge? Are you aware of any other material that the Department of Health has produced other than this single letter?

Mr WILSON: No. Our conversations were personal ones with the Department of Health.

Mr KIERNAN: We did not seek a full report from the Department of Health. We sought an acceptance of the thorough report that DUAP had put forward.

The Hon. J. F. RYAN: The report that DUAP put forward essentially appends a consultant's report from the Holmes Air Sciences prepared by Dr Kerry Holmes entitled, "Appraisal of odour issues for Northside Storage Tunnel" and the Northside Storage Tunnel report done by another consultant whose name escapes me but it has lots of letters in it. It is essentially a consultant's report prepared outside the Department of Health. Would it be a surprise to you that the Department of Health itself, given the importance of the health issue, has not prepared a written report outlining all the specific health risks and identifying the way in which the tunnel and the filtration system addresses all of those? Do you think that should be in writing?

Mr KIERNAN: It is not unusual for a department to call on highly qualified people to give a report and to then vet that. It appears that that is what has happened.

The Hon. J. F. RYAN: But there have been other issues. Is it known to you that there have been other issues examined by the Department of Health as late as a week ago where an expert panel was convened and they held discussions with Sydney Water on an important health issue related to Legionella? Do you think it would be helpful if that sort of material were available to the public and should be open to public scrutiny?

Mr WILSON: It certainly needs to be available to the Department of Urban Affairs and Planning who are deciding the regulatory and planning issues under their Act. One would expect it under EIS conditions that it would be made available to the public.

The Hon. J. F. RYAN: One of the problems that the community seems to have is that essentially the advice given by the Department of Health consists largely of oral advice given by its officials and it is not the sort of material supplied by the Department of Urban Affairs and Planning, for example, which does a fairly substantial report that can be examined. That appears to base, at least in my perception, some cause for the community to at least speculate on all sorts of other things because they get experts who give them written reports to which they get a response from the Department of Health, "Well, we do not think that report is any good. We have convened a panel of experts, unnamed, who have given us advice that this poses no risk." Can you understand why that might cause the public to be less than satisfied?

Mr WILSON: I can because, as I said, this process started because of lack of confidence in promises made by Sydney Water. If you are not going to assure people of safety, then there will always be a concern. That is why we made the effort we did because we were trying to get back some credibility in the regulatory process, or mainly in the regulatory process, to give people confidence, and that is what regulators should be about.

The Hon. J. F. RYAN: The final question I put to you is: do you think there is anything that could be done at this moment that would restore some level of confidence to the people at Scotts Creek

that this ventilation shaft is going to be of no risk to their health given that at the moment they rely largely on some oral evidence given by the Department of Health, a three-page report, which is the submission prepared for this Parliament?

The Hon. JAN BURNSWOODS: It is hardly oral evidence. It is a report into formal testing.

The Hon. J. F. RYAN: And a single letter. Do you think there is something else which can be done to establish and build trust?

The Hon. JAN BURNSWOODS: A report is not oral evidence.

The Hon. J. F. RYAN: On a point of order, Mr Chairman. I can ask questions on my own.

The Hon. JAN BURNSWOODS: We have gone round this over and over again.

The Hon. J. F. RYAN: We have. That is absolutely right.

Mr KIERNAN: We were most thorough in our management of this, in our participation in both Waterways Advisory Panels. It is very difficult for us. You have asked the question were we aware of the Legionella issue coming up in the last few days. It has been very, very difficult for us to keep in touch with developments, given the contentious nature of what has been happening down there, the protests and the fact that any trust we had of Sydney Water has been destroyed through this process.

The Hon. J. F. RYAN: Thank you, Mr Chair.

The Hon. JAN BURNSWOODS: I just wanted to come back. You were asked some questions earlier on about the options you discussed on page 58 of your report. The questions were all prefaced by "Are you aware that" and they are all a bit leading, but I was going to have my twopence worth as well. Are you aware that the options presented on page 58—for instance, lengthening the tunnel and additional hospital-grade filters—were in fact put to a public meeting of residents of the Scotts Creek vicinity but rejected by those residents?

Mr WILSON: We knew they were going to be put to a public meeting because when we visited the site we asked what was happening about the options but we did not know the results of that public meeting.

The Hon. JAN BURNSWOODS: Certainly, my understanding is that they were rejected.

Mr WILSON: Because we were concerned about continuing consultation. I think, to be fair to Sydney Water, they have improved their consultation processes this year.

Mr KIERNAN: There was plenty of scope for it, I might say.

The Hon. J. F. RYAN: That is not saying much.

Mr WILSON: But we pursued them because we wanted to make sure they were still talking to the public and they said they were going to put those issues to the public. That is all we know.

The Hon. JAN BURNSWOODS: Certainly, my understanding is that they were but the residents rejected them. That may tell you something about, I guess, the level of trust. It has perhaps become a problem on both sides and perhaps this Committee might do something useful by addressing that issue, because it does seem as if there are escalating problems, you know, "You said that", "You have this". Some of the things that you have recommended and what has happened to them since are perhaps examples.

CHAIR: On page 59 of your report you have a recommendation that alarms be fixed on stacks of both vents so that the public can be aware of events such as when the tunnel is charged to a level where the vent will commence to operate and so on. Are you aware that that proposal has not been adopted as well?

Mr WILSON: No, and I am disappointed about that.

CHAIR: It looks like they have completely ignored your report.

Mr WILSON: Well, that is a report to the Government. We do not know the communications between the Government and Sydney Water, but it was our view that one of the ways to restore confidence was not just to send an alarm back to North Head but to actually open the communications inside Sydney Water to the public by an alarm system. So that is the reason we put it in there: to open up the processes of communication and regain some confidence.

CHAIR: So are you as happy as you were with the Scotts Creek vent bearing in mind that none or your recommendations has been adopted?

Mr WILSON: I think we are happy that the Scotts Creek vent is going to be built and that it will make the whole system work much better. I cannot comment on the Legionella issue. Up to the time that we submitted our report, we were happy that the vent was safe but we thought that an alarm system needed to be available to the public to communicate those issues so they could see that those issues were being dealt with and that they could actually find out from Sydney Water whether proper monitoring of any discharge was taking place.

The Hon. P. BREEN: Mr Kiernan, you have indicated that certain promises, in your words, were gutted by Sydney Water. Could you indicate or just outline what those promises were?

Mr KIERNAN: Yes, certainly. The promise for a sludge return pipe to take the truck movements out of Manly, which through our public consultation proved to be one of the major concerns. There was the promise of an electrical conduit to address the disparity in electricity supply in the northern peninsula. There was the matter of lining in the invert and the recycled water pipe. All of these were taken out, and these were all major factors in us reaching our decision to support the tunnel.

There were some very good other proposals from the private sector but they did not fit the criteria, and we decided that in view of these promises that this was the best proposal. It was very disappointing for us to see our recommendations just tossed out the window.

The Hon. P. BREEN: Were there any promises made to you about the Scotts Creek vent that were gutted?

Mr KIERNAN: Not that I can recall, no.

Mr WILSON: Scotts Creek was not in the original design. We made a recommendation that the tunnel be extended to Scotts Creek, as I said, to stop the overflows there, so at that stage we were not aware—we are talking about 1997 now—of what venting arrangements would be needed at Scotts Creek or Tunks Park or Lane Cove.

The Hon. P. BREEN: Have you ever given advice to the Government about venting arrangements or a report about venting arrangements?

Mr WILSON: Only in this latest report.

The Hon. P. BREEN: Have you ever given any attention or thought to the question of pathogens in aerosol form that might be emitted from the vent at Scotts Creek?

Mr WILSON: They were the questions we asked of the Department of Urban Affairs and Planning. They were included in those questions.

Mr KIERNAN: We were most concerned about this issue, and it was a very difficult issue to manage. I have to say that I was very satisfied with the quality of the report that DUAP did. I think it addressed all of those areas of concern that we had.

The Hon. P. BREEN: Are you now satisfied about the question of pathogens in aerosol form?

Mr KIERNAN: Yes, I am.

The Hon. P. BREEN: Can I ask you then why you were concerned? I think your words were, "There is no point in transferring a discharge from Scotts Creek to Manly". What did you mean by that?

Mr KIERNAN: Because it is not a matter of it being a health problem. It is a matter of the angst it will cause within Manly that suddenly there is a huge amount of money being applied to deliver them a vent stack for an area out of their precinct.

The Hon. P. BREEN: But is health not more important than any question of that?

Mr KIERNAN: Absolutely it is, and my comments were not made in any way to reflect a concern in relation to the health aspect of it.

The Hon. J. F. RYAN: Is there not already a vent at Manly?

Mr WILSON: Yes, there is, sure.

The Hon. J. F. RYAN: And the tunnel will primarily be vented at Manly almost all of the time?

Mr KIERNAN: That is correct.

Mr WILSON: That is why we asked the questions of the residents of Manly and all the way along asked whether they had a concern about that. I think they should have had a concern, but they did not. They were so upset about the other issues they did not really take that on. We tried very hard to get from the Manly residents a comment on the venting issue and we did not get it.

The Hon. P. BREEN: So if there was a proposal now to put another pipe in and bring it back from, say, Scotts Creek to Manly, you would be opposed to that, I take it?

Mr KIERNAN: I would have a problem with it because it would affect the priorities that I spoke about earlier to address other problems in the catchment. Given that we are satisfied with the DUAP report, confirmed by the Department of Health, I would see it as a waste of money and it would further stir up the residents of Manly because while it might be providing, and in fact it would be providing, absolutely clean emissions, they are still going to be angry that the vent is coming to their location because already they feel that they are at the end of the pipe and they receive all of the problems from Blacktown, Hornsby and the rest of it.

Mr WILSON: And the priorities of the residents of Manly were getting the trucks out and fixing up Manly Lagoon.

The Hon. J. F. RYAN: And they have not got either of them.

Mr WILSON: They have not got either of them, so why spend the money on a pipe back there?

The Hon. P. BREEN: Can I ask you another question? You spoke about overflow problems and I was not quite clear whether you were talking about the overflow problems at Scotts Creek in the situation of a major storm or whether you were talking about the overflow problems in the harbour that this tunnel is going to solve. It seems to me just from my observation—correct me if I am wrong—that you are so happy about the overflow problems in the rest of the harbour being addressed that that may cloud your judgment about the effects or the likely impact of the overflow at Scotts Creek. Would that be fair?

Mr WILSON: No.

Mr KIERNAN: No, I do not think that is fair because if you look at our first Waterways Advisory Panel recommendations, one of those recommendations was that Sydney Water join with the private sector to address other overflows into Sydney Harbour. This tunnel is not going to fix every overflow into Sydney Harbour, and that is another promise that was gutted out of the arrangement, because it has never happened.

The Hon. P. BREEN: But it will certainly fix the major sewage outfall into Sydney Harbour, will it not?

Mr KIERNAN: Yes, it will have a very positive effect there, but it is not going to fix everything.

Mr WILSON: Well, it is going to fix a lot of the major overflows. It is not going to fix the dry weather discharge of sewage, which I think is the more dangerous form. If you talk about health, that is the most dangerous thing, because if it has not been raining and you are getting sewage discharge in dry weather, then that is of great concern because people think that they do not swim after rain, but if there is a dry-weather discharge, then there is a real health problem.

One of the problems with the sewer at Scotts Creek—and I suppose Sydney Water has told you this—is that it is well under capacity. It is a sewer that discharges very early in a storm event because it is well under capacity. Therefore, when Ian said it discharged raw sewage, it is not really raw sewage; it is rain-diluted sewage but it is not as heavily diluted by rainwater as, say, some of the other overflows, so it is a bad overflow from that point of view.

We were also concerned about sewage discharges that occurred above areas of recreation and stored water, and you will see that in the report. So we were very concerned about health issues and we are emphasising health all the time. Whether it is an aerosol effect of a spray of water coming out of the Middle Harbour submain at Scotts Creek or it is seeping down into Lane Cove National Park or the weir at Parramatta, they are the big issues that need to be addressed and they are the priorities that we believe the Government and the Parliament should be concerned with.

The Hon. JAN BURNSWOODS: I was going to return again to the options you recommended on pages 58 and 59 and we had questions about the fact that those had not been taken up. Are you aware in relation to the questions you were asked about your recommendations for alarms that the residents again actually refused to deal with the discussion paper on this basis that was put to them and that Sydney Water is attempting to have discussions with the residents about a system of alarms?

Mr WILSON: No, I am not aware of that but I hope somebody has some common sense and puts them there.

The Hon. J. H. JOBLING: The residents, for the record, were shaking their heads to indicate no to that.

The Hon. J. R. JOHNSON: Do you think the tunnel will assist with the clean up of our beautiful harbour?

Mr KIERNAN: Yes, I am absolutely convinced that it is going to dramatically improve the quality of Sydney Harbour. One of the recommendations of our panel was that $60 million be applied and would form the basis of the stormwater grant. That money is now being distributed in its third grant cycle. That has dramatically improved the catchment management of stormwater.

The tunnel is another thing that stands alongside of that in capturing those initial overflows in times of rain. So, I am absolutely convinced that the tunnel will be of great benefit to the quality of the water in Sydney Harbour.

CHAIR: Have you been advised what the additional percentage of venting would be at North Head if there were a return pipe from either Scotts Creek or Tunks Park?

Mr WILSON: No.

CHAIR: My advice is that it will be between point 08 per cent and point 1 per cent additional air vented there. Do you think one in a thousand extra will bother people at Manly?

Mr KIERNAN: I believe it would and at what cost, I might ask.

CHAIR: Well, at the cost of the people at Scotts Creek and the Glenaeon School if they go down with Legionnaire's disease as a result of not venting the air at Manly.

Mr WILSON: We cannot answer the question on Legionella because it was not within our understanding that that was an issue at that time. But as we see it, based on the reports that we received, there was no problem. I mean, to spend many millions of dollars taking a pipe back to North Head was not good setting of priorities for public money, given that there are the health issues that I answered Mr Breen about.

CHAIR: If in hindsight you were aware that the tunnel was going to cost $450 million and all those things were gutted out of it, you would not be supporting the—

Mr KIERNAN: No, certainly not. If at the time of doing our initial report we had realised that those add-ons were going to be gutted, there is no way I would have supported it.

CHAIR: And the extra money being spent as well which could be spent else where to better effect?

Mr KIERNAN: Well, I was not in a position to know about the cost overruns at that time.

The Hon. J. H. JOBLING: In your report of March 2000, you were extremely scathing about Sydney Water and their dealing with the public and living up to the expectations of the Government and the community. The words you use are that Sydney Water has not been entirely open about the Northside Storage Tunnel and significant promises associated with the project have not been kept and you go on to deal with the residents of Manly and sludge trucks. In view of what you have heard today and in view of what has happened to your report, have you any reason to believe that things have changed?

The Hon. J. R. JOHNSON: Yes, they have made the comment that things have changed.

Mr WILSON: For some reason, round about December 1999 there seemed to be a change of attitude within Sydney Water about the way they were dealing with the public. We suddenly saw a much more open organisation reporting to the panel and the information was coming much quicker and we were hopeful that the scrutiny that had been put on it by the public was starting to penetrate the right minds in Sydney Water.

So, I think there has been an improvement in their dealing with the public. They have a long way to go in catching up, but they are certainly attempting that now. That was a comment about those promises that were advertised in the *Manly Daily* in 1997 that were not kept but I think they are now starting to recover. Let me say, and I said this at a total environment conference the other day, Sydney Water in 1997 thought about only how to charge people for the water through a tap. It was a very narrow view of economics. They only thought about individual customers.

They seem to have got back to thinking about the city as important as a community, that the city is a customer and just as important as individual customers. They seemed to have lost that for some time round about 1996, 1997, but they are moving back to seeing some community responsibility in supplying a major city with water supply infrastructure and sewerage infrastructure. I hear they are now interested in trying to fix their antiquated drains.

The Hon. J. H. JOBLING: I suspect with the information and evidence before us that the public, I would dare to venture, do not perhaps agree with the view that Sydney Water has improved itself. If that happened, could you offer any advising as to the mediation process which we believe in actual fact virtually broke down? I accept you stayed away from it. Would it have been better to have had you there as well and why do you think perhaps it did break down?

Mr KIERNAN: I thought it had an opportunity to water down the value of our comment and divert attention to what might have been a solution and we were pretty sure it would not be the solution.

The Hon. J. H. JOBLING: You commented in your report, and I guess it is a fairly damming comment, the concern of the panel that Sydney Water's engineering credentials are sound, but then you go on to say that it is not necessarily innovative in the adoption of new technology to address sewage treatment and waste water problems. What led you to that conclusion and what would you be making by way of suggestion and how would you apply this to Scotts Creek?

Mr KIERNAN: Well, I am most interested in new technology. As a non-scientist, I chair the Co-operative Research Centre for Waste and Pollution Control, and that bring me in contact with some wonderful innovative solutions that can replace old-fashioned, transportation-type solutions. It seems to me that there is a lack of commitment by Sydney Water to address the opportunity of new technology.

I refer back to my comments that one of our recommendation was that Sydney Water work with the private sector in order to prove these new technologies in Australian conditions if they were from Europe or offshore and, through that process, address other sewage overflows. To my knowledge that has not happened.

The Hon. J. H. JOBLING: Do you know of any other system in the world that is comparable to the Scotts Creek vent? Have you seen it or are you aware of any such installation?

Mr KIERNAN: Again, I am not a scientist, but going through the process as we did, the report by DUAP and endorsed by the Health Department satisfied us. It seemed that if there were some better technology, that it would have been proposed, it would have surfaced, but I am not aware of any better technology than that which has been suggested.

The Hon. J. H. JOBLING: In your report you, in general terms, refer to the fact that the community and panel believe that the community required assurances that an underground tunnel would not affect groundwater and you asked for geological reports commencing on February 2000. Have you received these reports on a regular basis and has there been any question of addressing ponding of water in the tunnel, the question of osmosis and the effect of hydrogen sulphide being a fairly acidic gas in a dry tunnel on Sydney sandstone?

Mr WILSON: We are aware that the Government has approved the investigation by an independent consultant reporting to the Department of Mineral Resources and we wanted a separate regulatory body to do that. We addressed during our inquiry the issue of unevenness of the floor of the tunnel. The figures that we received from the EIS and on further investigation from the Department of Urban Affairs and Planning and then from Sydney Water were that there was a significant amount of flow in the tunnel and that that was being used to flush the tunnel with natural water . We are also aware that now part of the tunnel is going to have a concrete invert and that there should not be any stagnant water within the tunnel.

The Hon. J. H. JOBLING: You made the comment that the tunnel will be flushed with natural flow, natural water. Precisely where is this natural water coming from most of the time and how high up the tunnel are you envisaging this will be bearing in mind it is a six metre diameter tunnel?

Mr KIERNAN: We have made a couple of inspections of the tunnel through the course of construction so that we understood visually what was happening. Given the nature of Sydney sandstone, that it is not just an absolutely amorphous block but it has rifts and schisms in it, there is a degree of groundwater, aquifer water that is finding its way into the tunnel and that is being allowed to be maintained. That is my understanding. So that you will get a natural flush of any ponding that would occur there.

The Hon. J. H. JOBLING: So sewage left there by reverse osmosis could easily pass out of the tunnel?

Mr WILSON: No. Because of that, when we first understood the flushing system, we were concerned that, just as the public was and the question was raised by many members of the public, if

there could be seepage in, there could be seepage out. We had a report, once again from DUAP, that the pressures external to the tunnel in the rock formation are such that they would never be exceeded by the pressures internal to the tunnel, even when it is full of sewage. So there is always going to be more pressure to put water in and when the tunnel is empty or partially full, or even quite full, there is not enough pressure to resist the pressure in the external environment.

The Hon. J. H. JOBLING: But I am still left with the question how you satisfy yourself if a drain is out or half-way down that you are going to flush the tunnel other than the bottom half a metre or metre.

Mr WILSON: Well, the tunnel is going to flush by gravity because it is on a slope like that. The tunnel slopes towards North Head, and with the flushing of the groundwater, which is only going to flush across the small ripples—there is not going to be any great ponding of sewage in the tunnel—it will be very minor, and the flow of water will exceed the capacity to pump.

The Hon. J. H. JOBLING: So it is just across the ripples at the bottom we are really talking about?

Mr WILSON: That is right.

The Hon. J. H. JOBLING: So it is the bottom 20 centimetres or something of that dimension we might really be talking about?

Mr WILSON: If that much.

The Hon. J. H. JOBLING: Have you received any assurances, because you raised the question of Sydney Water, about the adequacy of electrical power to the North Head sewage plant or the Northside Storage Tunnel, or has that just been let go? Has EnergyAustralia demonstrated the power supply to be adequate?

Mr WILSON: The Minister told us that a report was to be prepared. We had assurances from EnergyAustralia but we wanted a proper undertaking from Sydney Water and the power authority that there would be that level of assurance. We were told by the Chairman of this Committee, actually, that there were substantial electricity or power failures on the north side, and that concerned us, and that there were a lot of questions on the notice paper of Parliament about that, so we were not prepared to take just a single assurance in a letter from the Managing Director of EnergyAustralia, but have asked for a full report. Now, I do not know what has happened to that report.

The Hon. J. H. JOBLING: So you are still awaiting a report?

Mr WILSON: Yes.

The Hon. J. F. RYAN: When you were asking questions about the health issues of the Scotts Creek vent, what was the source of the advice you were using when you were asking Sydney Water questions about that?

Mr WILSON: It was the consultant's report given to the Department of Urban Affairs and Planning.

The Hon. J. F. RYAN: But did you have any experts supplying you or was the community supplying you with the questions that you were asking?

Mr WILSON: The questions were certainly prompted by the community submissions. Each meeting of the Waterways Advisory Panel had a summary taken to it of all of the questions asked by all of the community members, so every time we discussed this issue people were fully briefed. The panel members were fully briefed on the sorts of concerns being expressed by the community.

CHAIR: Thank you very much indeed

(The witnesses withdrew)

KERRY TERESA HOLMES, Air Quality Consultant, Suite 2B, 14 Glen Street, Eastwood, sworn and examined:

CHAIR: In what capacity are you appearing before the Committee?

Dr HOLMES: As, I understand, an air quality specialist.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Dr HOLMES: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr HOLMES: I am.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you wish to make an initial statement?

Dr HOLMES: Yes, I would like to make an initial statement. I would like to provide a brief overview of my area of expertise and also my involvement in this project and the conclusions that I have reached about the air quality impacts of the project.

I am an air quality consultant, and I specialise in dispersion modelling. My background is in physical chemistry and I have also worked in the health research area for a number of years.

For the last 10 years I have been a consultant working in the area of assessments of air quality impacts of projects specialising in dispersion modelling. During the course of doing that work, I have done a lot of odour impact assessments, and it was in that capacity that I was brought into this project.

In December of 1998 I was asked to attend a community liaison committee meeting for both the Lane Cove and the Scotts Creek vent sites. My brief was to inform the committees about what odours were all about, what odour impacts were and how they could be assessed. My particular input was required because, as I said, I had experience in dispersion modelling.

I should point out that I was also not involved in the preparation of the environmental impact statement for this project. Throughout the process I have been present at many community meetings and public meetings and I have heard the community raise their concerns about both the health and amenity effects of the projects, and I have listened to their arguments.

When I first became involved in the project my initial impressions were that given the location of the vents in both cases the emissions would need to be controlled. The vent location was in a valley. It was close to what we call in the modelling game sensitive receptors—that means people and places where people live and where people spend a considerable amount of time—and because of that and because of the potential for odorous emissions from these vents, I considered that control of the emissions was appropriate.

No stack was proposed at that stage, and that appeared to be from discussions with the community what they preferred, so the control technologies that were available were a range of technologies, including biofiltration, activated carbon filters, other sorts of control technology, but in view of the fact that the emissions were intermittent, it seemed to me what had been proposed in the EIS—that is, activated carbon—was appropriate technology to control the types of emissions that were likely to occur from this vent—that is, predominantly sewer-type odour emissions, which are largely reduced sulphur compounds, rotten egg gas, the hydrogen, methyl mercaptans. They are largely associated with sewer gases or sewage processes.

As the meeting progressed, it became clear that health and particular pathogens had emerged, or microbial pathogens had emerged as a significant issue. From a review of the scientific literature, some of which, as has been pointed out, is quite old, the information indicated that sewage treatment plants and associated processes did not provide a unique health risk to the communities living round them.

Certainly, hydrogen sulphide is a toxic gas, and its effects are well documented, but the level at which it would probably be present at any of the sensitive receptors around this vent, even if the vent were unfiltered, would be most likely to be on amenity rather than on health.

In terms of the microorganisms, the New South Wales Department of Health again came into the process in the middle of last year, and they supported the conclusion that from their public health experience the aerosol emissions from the vent would not pose what you would call a unique public health risk but it was the sort of process that they were familiar with and they felt that it was unlikely that there would be any significant health risk from these emissions.

During the process of approval, some air quality goals were set for the project by the New South Wales EPA, and these goals are based on dispersion modelling. They are not ambient air quality standards; they cannot be sensibly measured in the ambient air. In relation to odour they have to be undertaken by dispersion modelling, and it is the results of the dispersion modelling which determine whether or not the goals are complied with, and that is a very important point.

I undertook some modelling, which was essentially a form of back calculation. The EPA set some goals for the project and I did a back calculation using dispersion modelling to work out what the concentration of both the odour and the hydrogen sulphide would be in the vent to achieve these goals.

Now, the assessment that I did was very conservative. It certainly took account of worst case dispersion conditions, which would certainly occur in the valley, but it also assumed that the vents would be emitting continuously, and the goal that the New South Wales EPA set for odour was a frequency-based goal. It was a goal which said that two odour units, which is a measure of odour level, should not be exceeded more than one per cent of the time throughout a year, but in the modelling that I undertook I assumed that the vent was emitting continuously every hour of the day throughout the whole year.

So this modelling I did was very conservative. It indicated some levels that would result in compliance with the goals, but it is important to note that on a particular instance that particular odour level does not have to be achieved given that the vents are probably going to be emitting anything at all about 5 per cent of the time, so already there is a very large proportion of the time where there are effectively zero odour emissions from this vent. That is an important factor to take into account.

So my conclusions are from all the processes that I have been involved in with respect to this project. I have been involved in the mediation processes. I was one of the expert panel, although I have not been involved in any of the mediation processes more recently.

My conclusions were that as the emission rates from the vents were uncertain they would need to be controlled to avoid the risk of nuisance odour impact and that the proposed technology to control this was appropriate. However, it was also my opinion that some fairly stringent guidelines should be set for testing compliance with the goals that the New South Wales EPA has set, and DUAP has set some conditions which I think are appropriate. They are certainly stringent, but given the controversial nature of this project and the need to be concerned about the potential impacts, I think it is appropriate that there should be regular testing and additional modelling done. Meteorological data is also being collected at the site. All those things are important in assessing whether or not the project is complying with the goals.

One of the issues we looked at was the potential for other air toxics to be emitted from this vent, and we did that by reviewing the information that was provided in the EIS on the likely trade waste contaminants in the liquid waste that would be in the tunnel. There certainly were a wide range of compounds that were likely to be there. Some of them were volatile, but given the levels of the compounds and the fact that there was likely to be dilution of the sewage or of the liquid in the tunnel, I

considered that it was very unlikely that these would cause certainly any health effects. They may contribute to some extent.

CHAIR: You made that decision that they would cause health effects or you got advice on that?

Dr HOLMES: No, I made the decision because all of these compounds have health goals associated with them. They have air quality goals, or most of them do, that are based either on health or odour, whichever is the more stringent, so there is completely independent information available in the literature to indicate what is, if you like, a safe level in the air for these compounds. So that was based on those goals that are set by regulatory authorities for the individual compounds.

The Victorian EPA has set a range of air quality goals for a wide range of air toxic compounds, so it was based on that that I came to that conclusion.

CHAIR: When you were first called in, you were only called in to address the odour problem; is that right?

Dr HOLMES: That is right.

CHAIR: Then the micropathogen problem came up. What were they discussing as potential problems?

Dr HOLMES: They wanted to know what was likely to be there or whether there were any health effects.

CHAIR: In your report on page 7 of September 1999, you talk about the review, that you had a review by Charles Kerr and you say that the exception to this is Legionellosis which, from all available evidence, is spread by air born transmission, and you say that the risk of Legionellosis is greatest when the habitat of the bacteria is disrupted. This would be after the filling of the tunnel. Are you aware that the Department of Health met last week to consider the possible problem of Legionella and would you know whether or not the proposed filtration system would remove Legionella and is it a possibility that Legionella could actually breed in activated carbon?

Dr HOLMES: I only became aware of that meeting this morning because I was sitting in the visitors gallery. Yes, I am aware of that. You asked me about the activated carbon filter, whether it would be effective. I do not know the answer to that question. I think the general consensus of opinion was that it would be likely to remove some of the aerosols which would contain pathogens. The extent to by which they would be removed has not been quantified. Whether or not Legionella can breed in that environment, I do not know the answer to that question.

The Hon. J. F. RYAN: Apparently on 13 March, 2000, you wrote to Darryl Berriman of Sydney Water and said, "As discussed with you, there are too little data on aerosol particle size distribution to do any reliable modelling. The sub-10 micron particle will behave effectively as gases, with little settling over the distance travelled from the vent to sensitive receptors. The larger particles will settle out more quickly but we do not have data on the relative proportion of these in the emissions." Does your dispersion modelling on the Scotts Creek exhaust include any effects due to particles of aerosols falling under gravity?

Dr HOLMES: No, it does not.

The Hon. J. F. RYAN: Is your modelling effectively restricted to gases odours and particles under the 10 microns?

Dr HOLMES: Yes, that is correct.

The Hon. J. F. RYAN: Will some aerosols and particles greater than 10 microns be emitted in the exhaust and hence not be accurately modelled?

Dr HOLMES: That is a possibility.

The Hon. J. F. RYAN: Does your modelling accurately predict dispersion of pathogens transported by aerosols or particles over 10 microns across?

Dr HOLMES: My modelling did not specifically look at pathogens in aerosols. I looked at the degree of dilution that would occur, so that would give an estimate of the degree of dilution of the aerosols from the original concentration in the vent to wherever the sensitive receptor was. But the modelling would be conservative in that sense in that it would not assume fallout of the aerosols. It would assume that they all travelled and all dispersed in the atmosphere. So it would tend to overestimate rather than underestimate the aerosols reaching, for example, the school.

The Hon. J. F. RYAN: Do you agree that as far as these heavier aerosol particles are concerned, what goes up will come down and stable atmosphere conditions and low wind speeds, in particular, give little chance for pathogens transported by heavier aerosols and particles to be dispersed before falling on nearby bush tracks, houses and nearby schools.

Dr HOLMES: I know they are the conditions under which dispersion is poorest and whether or not an aerosol will deposit will depend on a lot of factors. It will depend on how much sunlight is present, for example, because that will affect the evaporation of the liquid in the aerosol. If it is warm, if there is sunlight, the aerosol may evaporate a little more and be transported a little further. It is a difficult question to answer accurately, but I would contend that my modelling assumes that, effectively, it all gets to the school rather than falls out in between the vent and the school.

The Hon. J. F. RYAN: In your Air Sciences report of 13 September, 1999, do you agree that the EPA set air quality criteria for the Scotts Creek exhaust at a meeting held on 21 May, 1999, which was apparently after the Scotts Creek REF was published?

Dr HOLMES: That is correct.

The Hon. J. F. RYAN: Do you agree that you undertook dispersion modelling at the request of the EPA to calculate the upper limit of the emissions from the Scotts Creek exhaust to comply with the EPA's criteria?

Dr HOLMES: I undertook dispersion modelling at the request of the EPA. It was not necessarily to determine the upper limit. It was to determine what levels would achieve compliance but, as I pointed out earlier, because we are looking at in the case of odour a frequency based goal, there is more than one way of complying with that goal. If you have zero emissions for 95 per cent of the time, then that gives you a little more flexibility in your emissions for the rest of the time. So it was not necessarily an upper limit.

The Hon. A. B. MANSON: Are you satisfied that both the health risks and the EPA regulatory levels of odorous compounds will be contained at Scotts Creek?

Dr HOLMES: Can I ask you what you are referring to in terms of the health risks? Is it to do with the chemicals or the pathogens or both?

The Hon. A. B. MANSON: Any health risks.

Dr HOLMES: We are talking about two things, the health risks to do with pathogens and the health risks to do with chemicals. I am quite satisfied that there is no health risk associated with the chemicals. I believe that even if the vent were unfiltered, the issue would be amenity, odour impacts not health impacts.

In terms of the pathogens, I am personally satisfied that there will not be a health risk. That is based on my review of the literature and based on information from other experts in the area of public health.

CHAIR: Yet you do not know what these filters are all about?

Dr HOLMES: No, I do not.

CHAIR: So how could you make that assessment without that knowledge?

Dr HOLMES: My personal view is that it is not required because what we are dealing with is an intermittent emitter which contains within it pathogens that are part of, if you like, the normal sewage process to which people are exposed quite frequently, to people living around sewage treatment plants there is a potential to be exposed. So I did not see there was anything unusual in this which would lead to a public health risk.

CHAIR: Are you a health expert?

Dr HOLMES: I am not a health expert in this area. I have worked in the health field and in cancer research but I am not claiming to be a microbial health expert. My conclusions were based on a review of the existing literature, the experience which the New South Wales Department of Health bought to bear and also, I guess, a commonsense approach. I know that this is contentious, that sewage is all around us and sewer vents are all around us. The green vents we have been talking about are part of our environment. While the emissions from them are certainly in a different form, frequency and concentrations, they are of a similar nature and there is apparently no evidence to suggest that they constitute a significant public health risk.

CHAIR: Have you seen any evidence to show there has been any epidemiological study as to whether they do or do not cause—

Dr HOLMES: I think it is difficult to prove the negative. The studies that I have drawn upon and other people have drawn upon to support the position that there was not a large health risk associated with this type of operation or similar operations, the fact that they were old, I do not think that invalidates them.

In my experience as a research scientist, there are often times when there is considerable community concern about a particular issue and a lot of research is done on that issue and nothing much is found and so no more research is done for some time. I consider that, just looking at that information, because most or almost all of the epidemiological studies done in the 80s and 70s did not show anything, people concluded that there was not certainly a really measurable health impact from sewage treatment plants where aerosols are being generated as they often are.

CHAIR: Yet for many years there was no direct evidence that cigarettes caused health problems either.

Dr HOLMES: No, I understand that and I understand that you have to exercise the precautionary principle in all of this because lack of information does not mean there is no effect. I understand that principle. However, great difficulty in finding information, any direct link or any causality or even just association, indicates that the effect, whatever it is, is not likely to be very substantial. That was certainly one of the things that was agreed upon by the expert panel that, whatever the effects were, and it certainly was not agreed what the health risk was from this vent, whatever they were, they were not likely to be at an epidemic level and the effects were likely to be, according to those who thought there would be an effect, more at a subtle level rather than anything at an epidemic level.

The Hon. J. H. JOBLING: Does that mean simply that two decades or three decades ago our scientific knowledge was unable or of not sufficient standard to identify it or that the facts are that now, because there are no studies being undertaken, we are unaware of it and are making that assumption? I am putting this on potentially dangerous grounds.

Dr HOLMES: Yes, I understand what you are saying and I guess I cannot give you a categorical no to that or disagreement with it.

The Hon. J. H. JOBLING: You would have to agree, though, there is reasonable basis for a potential doubt?

Dr HOLMES: There is some doubt and that is why we are here because we all agree we have not proved anything conclusively. The balance of evidence, in my opinion, is that the risk is very low.

The Hon. J. R. JOHNSON: Ralph Kaye and other consultants to the school have stated that hydrogen sulphide levels will pose a health risk to the community. What is your response to that?

Dr HOLMES: Hydrogen sulphide has very well defined health impacts. It is a gas that has been very well studied over the years, and part of the report that I prepared indicates the health bands for hydrogen sulphide. Generally the lowest health effects are in the 10 to 20 parts per million level, whereas the levels that we will be talking about that might come out of this vent and then be dispersed and controlled by the filter are a thousandfold less than that and they are at a level where odour may be detected but there are no health effects. You can detect hydrogen sulphide at a much lower level than there are any health effects.

The Hon. J. F. RYAN: In other words, you can smell it before it starts to hurt.

Dr HOLMES: It is something that is associated with things we do not like. Our nose is very sensitive to it.

The Hon. J. R. JOHNSON: Can you tell us whether the activated carbon filter will work correctly in a wet environment?

Dr HOLMES: It will certainly remove hydrogen sulphide in a high humidity environment. The granulated activated carbon will.

The Hon. J. R. JOHNSON: Can you tell us how the granulated activated carbon will work?

Dr HOLMES: This particular one is impregnated with potassium hydroxide and there will be a reaction between the hydrogen sulphide and the potassium hydroxide. That will, to some extent, neutralise the pH, which will be quite caustic, and over time that will happen.

The Hon. A. B. MANSON: Have you seen any evidence put forward by the community during this inquiry that has changed your conclusion on the health risks?

Dr HOLMES: No, I have not seen any information that has changed my conclusions. What I have seen is information that makes me very aware that the community has considerable concerns about the health risks.

CHAIR: Legitimate concerns or not?

Dr HOLMES: I think all concerns are legitimate in the sense that if you are worried about it then something should be done to alleviate that concern, whether that be some testing of the process that is going on. I think that is probably the most appropriate way to do it.

The Hon. A. B. MANSON: In your opening statement you advised us that Scotts Creek is located in a valley.

Dr HOLMES: Yes.

The Hon. A. B. MANSON: I also understand that it may be prone to low cloud. Was this and the proximity of the school taken into account in the air quality studies?

Dr HOLMES: Yes, it was. We took account of the fact that there will be inversions in that valley and we modelled under those conditions.

The Hon. J. F. RYAN: Is it a fact that your air modelling is based on the assumption that the emission output of the ventilation shaft produces a limit of 50 odour units?

Dr HOLMES: Yes, it assumes that it is emitting all the time at that level.

The Hon. J. F. RYAN: Did the Alliance inform you that the chemical scrubber at North Head, which apparently has a slightly higher level of removal of hydrogen sulphide than the activated carbon filters, only guarantees an output concentration of 500 odour units in its emissions?

Dr HOLMES: No, I have not been informed of that.

The Hon. J. F. RYAN: If that is the case, could it possibly be that the level that you have used of 50 odour units might produce a problem with your modelling?

Dr HOLMES: Well, as I pointed out, that was based on 50 odour units continuously throughout the whole of the year, but in fact there will be emissions only for, say, 5 per cent of the year, so it does not actually have to comply with that 50 odour units all the time; it can be significantly higher than that and still comply with the goals.

The Hon. J. F. RYAN: Is it not a fact that this thing has bursts of output?

Dr HOLMES: Yes, that is right.

The Hon. J. F. RYAN: And that is what you are measuring?

Dr HOLMES: It is certainly what you are measuring but it was not what we were modelling.

The Hon. J. F. RYAN: So to what extent is it relevant what it does during the rest of the year? It seems to me that to get an accurate model you would be measuring what occurs, which could well be 10 times greater than you originally assumed in your modelling.

Dr HOLMES: Part of the conditions of consent is that modelling is done and modelling is redone with those odour emission rates and, indeed, the existing meteorological conditions at the time that they occur because the modelling assumes that the 50 odour units is going to occur at all times of the year under all meteorological conditions.

Now, there are a lot of other scenarios that you could model that said that 95 per cent were zero emissions, 5 per cent of the time there are emissions that range between these levels, and it would still give you the same compliance with the EPA's goals.

The Hon. J. F. RYAN: Just finally, you have a list of literature which you have basically said has some age to it.

Dr HOLMES: Yes.

The Hon. J. F. RYAN: Is there any significance as to, first, why it all seems to be dated 1980? Was there some sort of flurry of interest in this around 1980 and is its authority in some way undermined given the growth of information about microbiology and its effects on people? Can we still rely on it 20 years later?

Dr HOLMES: That is a reasonable question. I do not know for sure, but my interpretation of that is that if there was a flurry of activity it was because of some public health concern and that the information showed nothing much, but I think that the tools that we use to assess it are tools that would still apply today. There were epidemiological studies, and there were studies of the organisms in sewage which were pretty well characterised then and still are.

(The witness withdrew)

(The Committee adjourned at 5.18 p.m.)