



ENVIRONMENT, RESOURCES AND DEVELOPMENT COMMITTEE

WASTE MANAGEMENT PRACTICES IN SOUTH AUSTRALIA

Old Parliament House, Adelaide

Wednesday 12 February 1997 at 10 a.m.

(OFFICIAL HANSARD REPORT)

PARLIAMENT OF SOUTH AUSTRALIA

MEMBERS:

Mr I.H. Venning (Presiding Member)
Hon. M.J. Elliott MLC
Hon. T.G. Roberts MLC
Hon. C.D. Schaefer MLC
Mr K.A. Andrew MP
Ms A.K. Hurley MP

WITNESSES:

REUBEN STANLEY WEBB, Chairperson, Inkerman Proposed Action Landfill Group, Box 312 Balaklava 5461; and JILLIAN MAY STEWART, Secretary, Inkerman Proposed Landfill Action Group, Avon 5501, called and examined:

756 THE PRESIDING MEMBER: Welcome to the committee. I bring to your attention sections 28 and 31 of the Parliamentary Committees Act 1991 which set out the privileges, immunities and powers on of this committee and the protection afforded to witnesses. Section 26 of the Parliamentary Committees Act provides that members of the public may be present during the consideration of evidence unless the committee determines otherwise but may not be present during the deliberations of the committee. If at any stage you wish to go off the record the committee will consider your request and no record will be taken by *Hansard*. I note that you have distributed written material. I now ask you to address the committee?—(MS STEWART) We have come here today to present not so much the Inkerman issues but what we see as big problems with landfill dumps.

757 I notice you have distributed a fairly long paper. Would you address it?—Our key issue is that a number of landfills are being proposed at the moment. All these landfills are under EISs. We feel that this process has a lot of shortcomings and costs the taxpayer a lot of money. Once these EISs have gone through due process the Government makes a final decision. We feel that the shortcomings of this process begin with the site selection. Developers tend to look for a cheap piece of dirt or a quarry and then make an announcement. They are then asked to put out an EIS on their landfill and it becomes a landfill justification document, because they are interested in selling their proposal and not in an actual environmental impact study as we all consider an environmental impact study should be. Therefore, we are left with this landfill justification document which the EPA and the assessment board then have to inquire into, and that costs the taxpayers a lot of money, when you consider the number of landfills on the books at the moment. We see that this problem could be solved if proper siting and selection was done for the whole State and then an unbiased EIS done on those areas and paid for by the developer. We have listed all this in our submission.

758 THE HON. T.G. ROBERTS: Would you see the EPA as being the appropriate body to do that investigation and siting?—Yes, I do. As an instance, one has been done on toxic waste, and Australia is doing one on radioactive waste. The same sort of thing should be done in South Australia for metropolitan waste. It is the only way we will come up with a safe and sure method for landfill, and without that type of site selection happening we will always have community consultation. The community tends to find out by any means; it is not consulted but told, and it is then asked to enter into an EIS by putting in submissions. People have to learn fast and, in the case of Inkerman, which is a very small rural community, the pressures of doing this are unbelievable. I cannot emphasise that enough. We are farmers in our local rural area, not lawyers or scientists, and I cannot explain what stopping in the middle of harvest to reply to an EIS did to my family alone.

759 MR ANDREW: Notwithstanding those comments with respect to the EPA's role, what role do you see for local government as part of the process?—(MR WEBB) Mainly it involves local knowledge of the situation in a particular area. One of the problems here was with this particular site. Local government was never involved in the siting of this block; it was only a former CEO who put in a submission to the South Australian Waste Management to locate a hazardous waste dump there. It was unbeknown to the council or councillors until long after that submission had gone in. One of our arguments is that as long as he has a block of dirt anybody can put a proposal to the Minister for a landfill, and then it is a matter of producing not necessarily an EIS but a justification document for that landfill. That means the community is not consulted until virtually after the site is selected and then the battle begins. If the community does not believe it is the right place or that it is environmentally wrong to locate that landfill there it becomes a battle between the proponent and the community. This is the stage that Inkerman has reached, because that site is so close to the gulf and is environmentally unfriendly and an eyesore to the travelling public up highway 1, not to mention the damage done to adjoining crops when you consider that there are only 20 metres between the proposed landfill boundary and the cropping ground. If as the proponent suggests he will pick up the plastic bags from the crop each morning, what sort of crop will be left?

(MS STEWART) We feel that immediate action needs to be taken, and we request that the Environment, Resources and Development Committee provide advice to Cabinet to withhold approval of any current large landfill proposals until a review of the process is undertaken and the proponents can demonstrate compliance with any amended requirements. Failure to take this action will result in shutting the gate after the horse has bolted, as most of the current proposals have enough landfill space to accept waste beyond the next 30 to 100 years. So, once one of these proposals is accepted, anything else that we are doing in waste management is virtually just a waste of time.

760 THE HON. CAROLINE SCHAEFER: Do you believe that there is anywhere in the Inkerman District Council or the area surrounding Inkerman that would be suitable for landfill?—Some areas are possibly suitable, but then you will come up against this cropping problem. We are supposed to provide clean, green grain. The proponent suggested that the grain could be carted back to Adelaide in dump trucks. Could you sell that concept to the

Chinese and Japanese? The same thing will apply to our wheat. We grow very high protein wheat in our area. It does not matter if it is not a problem: we do not want it to be seen growing alongside a mega-landfill. It will not look good, but there are lots of other reasons why Inkerman cannot go ahead. We have come up with the best solution we can find. There is a perfectly good railway line to Leigh Creek, and its costs are comparable to the proposed Inkerman landfill. Our grain freight by truck to Port Adelaide in 1996 was \$13 a tonne and the cartage to Port Augusta figures are all shown here. Rail 2000 got a consultant to put together the figures.

We wrote to the Manager of the Leigh Creek coal field and the reply was that they were not averse to having waste at Leigh Creek. Leigh Creek has enough room up there that the waste could be mono-filled and resource recovered at a time when the technology and quantities are available to recycle in an economical fashion. The sustainability of the way we are going about recycling at the moment is questionable, because we have isolated pockets all around the State. We could be taking the northern metropolitan waste and possibly all of Adelaide's waste to Leigh Creek and mono-filling. We can also bring in the northern areas such as Port Pirie and Port Augusta—there could be transfer stations anywhere along the line to take this waste to Leigh Creek. Those documents and letters are contained within our submission under Appendix B.

761 How close is your farm to the proposed landfill?—About five kilometres.
(MR WEBB) Neither of our properties adjoin the proposal.

762 You are not the adjoining neighbours?—No. We initially became involved with this landfill issue when Max Harvey, of South Australian Waste Management, became aware of a proposal for a toxic waste dump at this Inkerman site. The fourth page of appendix B shows the locations for hazardous waste, and you will notice that one location is between Balaklava and Mallala. Six sites were proposed and the preferred site was between Balaklava and Mallala. An attempt was made to transfer that dump to Inkerman, but Max Harvey would not have a bar of that and told the CEO of the Wakefield Plains council that the dump could not be located at that site; it had to be placed at the preferred site, and that work was undertaken by consulting engineers, Sinclair Knight.

As yet a decision about that hazardous waste site has not been made. We have been asked, 'Are there other suitable localities?' The answer is, 'Yes, there are other suitable localities', but you would need a buffer zone far greater than 20 metres: you would need a buffer zone of at least 100 metres. You would also need a fence higher than a two metre chainmesh fence. The diagram in our submission shows that the height of the landfill is 27 metres, which is a far greater height than a two metre chainmesh fence, which means that rubbish from that site will finish up over that mesh fence. A two metre mesh fence will never contain it.

763 THE HON. T.G. ROBERTS: Your submission this morning basically covers the aesthetics and nuisance value of the landfill in that area. The committee visited the site, and

some members of the committee were concerned about the problems associated with crab holes or collapsing subterranean holes, which vary in size and could lead anywhere. Would you like to comment on the environmental reasons for those holes, including the height and tidal nature of the underground water?—(MS STEWART) Certainly the crab or sink holes are very evident in our area, and we presume you were shown those the day the committee visited the site. I have a report from a geophysicist who suggests that when the ground is compacted, as the proponents suggest, it will open up more crab or sink holes in areas outside the dump site. I believe that is correct because we have a huge crab hole in our driveway. My kids were very frightened of it and we would fill it in. However, it is a good example of a crab hole. When we fill in that hole it just opens up a bit further away.

The council experiences the same problem: once it compacts these holes that appear in a road they open up somewhere else. The other thing that worries me about the proponent's suggesting that this ground can be compacted and that the sink holes will not be a problem is that the railway line runs near our property. For example, once the quarry was established crab holes appeared. The proponent also talks about liners. The head of the EPA in America made the statement that all liners leak. The type of material used for liners would not contain a crab hole because they are made of polyester, or something similar.

The liner material is soft and you would need a huge sheet of steel or a concrete slab to stop anything from falling into a crab hole. The crab hole in our driveway just continues to drop; it is getting very dangerous and we will have to close it up. Crab holes are all around the dump site. In fact, only a fortnight ago we visited the site where the proponent will bring in his trucks and there were two crab holes right in the middle of the road. That is one problem. We are located in an extremely windy position. Maps from the Soil Board indicate that Inkerman is bang in the middle of a high-risk wind erosion area, and I think that speaks for itself. The proponent has included wind charts in his EIS, but those wind indicators were taken at 3 p.m. and 9 p.m. He has not included maximum wind gusts for the day, and so you get an untrue and unreal picture.

The other problem we have concerns drainage. Drainage is above road level and, because the road is undulating and the water will back up against the roads—similar to the problems with the railway line up north at the moment—there is no way the water will climb a metre to the drainage swale. The proponent suggests that he will take this water to on-site swamp land, which is already salt water. The idea is to pump that salt water out over the buffer zone, and we believe that that will spread salt further afield. That is not what farming is about: we are trying to stop salts and salinity. The area has major problems, but if you visited the site you would have seen some of them. I presume that you were shown instances of crab holes.

764 THE HON. M.J. ELLIOTT: I have an understanding that the council initially created zoning to allow for something like a dump, and then the council subsequently opposed it, and you have a copy of a document from the council dated 24 September. Do you care to comment on the council's position?—(MR WEBB) The initial proposal for a hazardous waste

dump was submitted in 1991, unbeknown to council or councillors. We got to hear about it and opposed it. No zoning was in place for that area at that time but, as stated in our submission to South Australian Waste Management, the area was to be zoned 'development'. As pointed out to the council, the area had a two inch water main, which would not service any industry at all, and is at the end of that line at that site. It meant that if that two inch water main was opened up no-one else got any water. That was the first problem.

The second problem was that the nearest three phase power line for any industry was seven kilometres away, and the first industry to establish on that site would be required to pay \$350 000. That site is six kilometres long, so that if two industries were at either end of the site they could pay the same amount. If two industries were not compatible and wanted to get away from one another, it could cost \$700 000, hence no industry was ever interested in that particular site. We venture to say that that site was never meant to be industrial: it was created only to house a rubbish dump.

765 From where did the original proposal for the rezoning originate?—
(MS STEWART) The then CEO employed by the council. It is very difficult to understand. People cannot understand how that zoning got through, but the then CEO said, 'Bring in your submissions; we will send them on', and people believed him. It was only later that we found out that many of these submissions went into the rubbish bin. That CEO left our council and went to work for Cleanaway.

(MR WEBB) The council believed what it was told. It believed that the amount of money the Adelaide City Council gets from the Wingfield site would flow on to the Wakefield Plains council; that it would get \$4 million and we would have \$1 million. We lost Gerard Industries because that CEO was not interested in Gerard Industries: he was interested only in rubbish dumps, hence Gerard Industries finished up at Strathalbyn. The community is rather furious because Gerard Industries would have employed a number of people at Balaklava.

(MS STEWART) It should also be pointed out that, whilst this enterprise was put in place and waste management was one suggestion, no studies were ever done to see whether or not it was suitable. The enterprise was located over a coalfield that was covered by an exploration licence. That exploration licence was removed only, we presume, when the proponents approached ETSA about it. That exploration licence has been removed to the top boundary of the dump site. A lot of horrible business has gone on behind that development plan. The CEO announced in council that anyone who opposed the proposal were just campaigners of darkness and should be ignored, and we have all that evidence. We have not said anything that we cannot back up. We have not presented all the evidence because we have piles of it.

766 I obviously have not had a chance to read your submission, but you mentioned a geophysicist. How much information do you have on the crab holes and their significance?—
The geophysicist wrote to me on a private basis. (MR WEBB) It is pretty hard for Mines and

Energy to explain it—it cannot explain it. We have had three inches of rain this last week and it lies in one particular spot. I suspect that the soil underneath collapses.

(MS STEWART) The water sucks air. We do not know how to explain it. I asked the geologist from the EPA and her explanation was very vague. It is very difficult for us. (MR WEBB) There is a difference of opinion about the movement of the ground water. We suspect that if there is pressure from ground water, soft soil will be drawn into the ground water. We know from experience that all our bores and wells will stand up to the movement of ground water and that sand will travel 20 or 30 metres up a bore.

767 THE PRESIDING MEMBER: What is the salinity level of the bores in the area?—It varies quite a bit. I do not believe that we have the data on these bores. (MS STEWART) The only data available is what the proponent prepared, and I have included a letter from Coffey and Partners in your supplement. However, it is almost like an apology: they do not know where the bores are—whether they are 50 metres this way or 50 metres that way.

768 THE HON. M.J. ELLIOTT: Can you indicate where the nearest bore is to the site that is used for stock purposes?—(MR WEBB) Probably at Balaklava—or Rundle's.

769 How close?—Three or four kilometres.

770 In other words, the water nearer that is too saline for stock use—is that the reason why it is not used?—It probably is over a pattern, but there are fresh water breaks out of some areas—for example, the side of the sandhill on this particular site—where the water is drinkable. That would probably be about 800 parts in a million, I would imagine. Where I grew up, west of Balaklava, most of that water is 600 parts per million or less; however, it seems to me to become more—

771 THE PRESIDING MEMBER: That is around Bowmans?—Yes, from Bowmans, west of Balaklava, which would probably be about 10 to 12 kilometres from this site. However, the water gradually becomes more saline as it heads towards the coast. Not all streams are of the same salinity; they vary. Some of them would be suitable for stock water, but they have not been harnessed because the flow rate is not great enough. You need flow rate and low salinity for stock water. If you do not have both, you use mains water.

772 MR ANDREW: I note in your introductory comments, and it is reinforced in your submission—and I refer to the issue of the process of EIS—you imply, or suggest that the process does not lend itself to honesty. I wonder whether you can elaborate in regard to that and detail your reference?—I feel that particularly the environmental issues are not structured in the EIS properly. I do not know how else to say that without being derogatory. If the EIS is prepared from an Adelaide desk, without seeing what happens environmentally, then I do not believe that you can get a true picture of what is actually there. If you look at the topography, to start with, the ground varies in height from a few metres above sea level up to a

certain height. That is not stressed as a major problem, but we see it as a major problem, because to flatten that area you are going to be running into ground water. As soon as you start mucking around with ground water you have all sorts of problems—as they found out at the coal hole at Bowmans. They allocated five pumps to pump the water away and, in the end, 25 pumps were not keeping up with it. We say, if you start playing with ground water at this site, what sort of problem are you going to have? I do not think it was ever stressed in the EIS document. As to the use of the salt pans, I believe it is very misleading to use the big salt pan. I suppose you have all seen that big salt pan as a storage dam. Then if they pump that back over the mound, I do not see how they can ever grow trees on a particular site if they are pumping salt water all over it: it is impossible.

773 THE PRESIDING MEMBER: When was this landfill group formed?—Probably two years ago. Originally we were members of another group. (MS STEWART) The Mid North Action Group was the group that fought the toxic waste proposal, and that has never really disbanded as such. However, because of the workload we decided to set up another committee, to give that group a break. It was formed in about April 1995.

774 I am aware that the concept has been around since about 1990: I was a member at the time, when Paul Guerin was the mayor. As you said, the first proposal was in 1991. I thought it had a pretty reasonable public airing: would you agree?—The toxic waste dump did, because that was because at that time South Australian Waste Management made sure that it went to each site, and it had probably half a dozen or more meetings at Balaklava, Port Wakefield, Port Augusta, Tailem Bend, and wherever else those particular sites were. That is the way the publicity was handled on those sites.

775 Were you a member of the council at the time?—(MR WEBB) No, I was not. However, I believe that Max Harvey did a very good job of presenting the Sinclair Knight document at those workshops. We have no argument with that at all.

776 Were you on the council prior to that time?—Yes. It has to be remembered that when Max Harvey presented the Sinclair Knight document at the waste management meetings we were not talking about Inkerman; only the CEO—or the Wakefield Plains council, in inverted commas—was talking about Inkerman. Max Harvey was talking about an area more in the Grace Plains area, which is flat with a deep clay base. Inkerman does not have a deep clay base, but has sandy soil: it is a totally different soil. We have had a proposal to have hazardous waste and an asbestos dump on this Inkerman property, which was withdrawn by Path Line, and now we have had a general landfill proposal on this property. It is all on the same block of dirt, and the only reason it is on this block of dirt is that it is for sale. This is our point, that if any of us finds a block of dirt and wants to put a proposal on it, we can.

777 What is the current council's position: is it supportive, not supportive, or has no opinion?—Total support. (MS STEWART) Total support for opposition of the dump. (MR WEBB) They are not in favour of the dump. They have a very good site at Everard Central, or Bowilla and, talking to Steve Jonas a couple of days ago, it would have been far

better to put it there, because it is salty swamp country. The Blyth-Snowtown council has been using it. Now it is being used by the Wakefield Plains council, which does not have a landfill in its area at all: all of its landfill goes to this site. Steve Jonas commented to me the other day that it was a pity we did not think of it sooner, as we could have put it up there, because it is not a problem.

778 MS HURLEY: How much further on is that?—Forty kilometres.

779 THE PRESIDING MEMBER: The previous CEO was Mr Johnston, who is now an employee of Cleanaway, as you said. Cleanaway does not own the site, does it?—No. However, we know that he would have been working for Cleanaway while he was still working for the Wakefield Plains council.

780 As I said, Cleanaway does not own the site?—It does not own the site, and there is a caveat on the site by Path Line.

781 THE HON. T.G. ROBERTS: What is the caveat?—\$2 000 a month for as long as it takes for a decision to be made.

782 The flat site with the clay base at Bowilla, to which you referred, how far away is that?—That would be about 40 kilometres on from this particular area.

783 That is the same site you were talking about that is now being used by the Wakefield Plains council?—Yes— Wakefield Plains and Blyth-Snowtown.

784 Do you have a general ballpark figure on how many hours you have put in on this submission?—I would say the girls—Jill, Reg's wife, and my wife—would have spent probably five or six hours a day for the whole of the harvest—not this one—on the response to the EIS. That would have been a part of it. Through our innumerable phone calls we have come to know many lovely people, and we have met you people, whom we would never have met otherwise. (MS STEWART) What I am trying to say concerning this problem of trying to respond, particularly during harvest and at Christmas, is that in small communities the same people are always the leaders. So, they are stretched beyond the limit. There are not enough people in some of these areas, and it is always the same type of person who gets to do these jobs, somehow or other. If Yvonne had not made a Christmas pudding, my family would not have had Christmas. I think in Australia—which is, basically, a Christian country—it is very poor that we had to miss out on Christmas. We had to have the submission in by 2 January, and we were up until 3 o'clock on New Year's Eve to prepare this submission.

785 I would like to congratulate you on the submission. It is a credit to the small group that has put it forward, and it is well presented.

THE WITNESSES WITHDREW

ADDITIONAL WITNESSES:

MAXWELL HARVEY, Acting Manager, Recycling Waste Branch, Office of Environment Protection, PO Box 276 Stirling 5152; and DEAN MacMULLEN, Senior Adviser, Solid Waste, Recycling and Waste Branch, Office of Environment Protection, GPO Box 496 Adelaide 5001, recalled and further examined:

786 THE PRESIDING MEMBER: Gentlemen, I welcome you back to the committee. I draw to your attention sections 28 and 31 of the Parliamentary Committees Act, which set out the privileges, immunities and powers of this committee and the protection afforded to the witnesses. Section 26 of the Parliamentary Committees Act provides that members of the public may be present during the presentation of evidence unless the committee resolves otherwise, but may not be present during the deliberations of the committee. If at any stage you wish to go off the record, the committee will consider your request. If it agrees, then no record will be taken by *Hansard*. Will you provide us with background information? We would like to hear from you on the specifics of landfill design and the operations, and on what monitoring is presently being undertaken by the EPA, particularly on leachate. Before we commence I understand that a number of questions were taken on notice at your last appearance before the committee on 2 October last year. When can the committee expect a response to those questions?—(MR HARVEY) Within a week. I am Acting Manager of the Recycling Waste Branch of the Office of Environment Protection. I will outline the framework of the current landfill situation and hand over to Dean MacMullen to talk about the specifics you have requested with regard to monitoring and operation.

The document, 'Integrated waste strategy for metropolitan Adelaide' was released in the middle of last year. Arising from that strategy a number of key issues were identified, including the development of a strategic plan for waste management infrastructure, the plan to include waste transfer treatment resource recovery facilities and landfill, the upgrade of licence conditions for waste depots and the negotiation of environment improvement programs, a review of the environment protection (waste management) policy, development of the pollution prevention program to provide incentives for industry to introduce cleaner production and waste minimisation, development of a national scheduled waste tracking system as a national environment protection measure, establishment of a secure repository for hazardous waste and development of a green organic waste management strategy.

I will expand on the development of the waste infrastructure plan. The Office of Environment Protection and the Department of Housing and Urban Development have agreed to joint funding of this program and the establishment of a steering committee to oversee its development. The steering committee has been established and has now met on two occasions. Representatives come from the Conservation Council, the Australian Waste Management Association, local government, the Economic Development Authority, the Department of Premier and Cabinet, the EPA and DHUD.

The committee is focused on the issue of landfill disposal in its early deliberations, although emphasis will shift to resource recovery and longer-term disposal issues. The major issues raised to date are the establishment of siting criteria for proposed landfill, the development of operational criteria for landfill and the adequacy of waste management data currently available. The steering committee has noted work carried out by the South Australian Waste Management Commission, which developed siting criteria and which adapted that criteria to map the State and determine the most suitable localities for these types of facility. I table a 1993 report, prepared for the Waste Management Commission. I also table a matrix of siting criteria, which compares the criteria developed by Sinclair Knight with other jurisdictions.

The factors that have been taken into account in developing those criteria include the terrain and land form, flooding potential, seismic risk areas, unstable soils, proximity to conservation and recreation areas and residential development, proximity to high quality ground water and proximity to the waste source and accessibility. The report identifies a number of areas to the north and east of Adelaide which, purely on this type of criteria, would be suitable for landfill development. With regard to operational criteria, I also table a draft document currently being refined by the Office of Environment Protection called 'Interim criteria for solid waste landfill depots'.

This document, which is still in draft form and 85 per cent complete, puts together siting criteria, performance goals and operational criteria aimed at providing guidance to industry on the standards required. I hope the document will be used to ensure that siting space is done more on the appropriateness of the site rather than what has happened in the past with siting based on availability of land. It can also ensure that companies from the start are fully aware of the standards that have been attained.

787 THE HON. CAROLINE SCHAEFER: When those criteria have been worked out and you have a map of suitable landfill sites throughout the State, will the local government areas involved be informed?—Certainly they will be and I will talk about that later.

788 We have had various people give evidence that they were unaware of the possibility of a landfill site until much too late in the process. Hopefully that tendency to secrecy will be avoided by the release of earlier information?—One of the aims of the steering committee, following an approach from the Waste Management Association of the Australian Conservation Council, which put together a proposal which could best be called 'community supported landfill development', was of the view that we should effectively be seeking registrations of interest from communities where you can look at codes of practice for operation, siting criteria and environmental management systems so that we can be assured of the types of waste that go to the facility and can look at the community benefits that arise from these sort of facilities because they have considerable revenue generating potential.

One of the problems has been that those communities in the past have not benefited from them at all. I have been through the consultative processes myself where the difficulty is getting back to fairness where it can be perceived that people in Adelaide are trying to get rid of their garbage and imposing it on another community. There is no benefit to that community. We want to see that turned around so that there is benefit, be it financial, the development of community resources or whatever. With the infrastructure steering committee we are looking at putting out registrations of interest within one to two months.

789 THE HON. T.G. ROBERTS: Does the steering committee look at resiting of inappropriate sites that exist?—That has not been the agreement. I would see that being more to do with the ongoing work of the Environment Protection Authority.

790 MS HURLEY: What about where the council itself has some interest in the company disposing of its waste? How do you view that in terms of expressions of interest from a particular area?—Again you need to meet all the criteria. As long as the council is operating in the broader interests of the community and the community is aware of it, it is all right. I have dealt with councils where a council has been very pro a landfill development, but did not keep the local community informed at all.

791 Do you see any role for either the EPA or any committee to take over that informing of residents if the council is not presenting all the information?—If you are looking at a registration of interest process, unless you can demonstrate that support, it would not be successful. There has to be demonstrated support. We have been talking along these lines for some time and some waste companies are starting to recognise that there may be some merit in it and a number of companies have been negotiating with councils. The difficulty is that it has not got past negotiating with council members or bureaucrats. The next step of talking to the community is one that everyone finds difficult, but it has to be done if we are to overcome the community concerns arising in this area.

I will refer to waste data. Information currently available relates to waste quantities received at landfill being used as the basis for determining levy payments to the Environment Protection Authority every month. Information on waste composition has been relatively limited. Whilst information on quantities provides a basis for planning for future landfill capacity, it is not adequate where our focus changes towards resource recovery. Recycle 2000 or the Local Government Waste Management Board undertook an audit of waste composition arising from council collections and recently reported the results. The Office of Environment Protection is to undertake an audit of the commercial industrial waste sector in the coming months to assist with the planning of resource recovery facilities. We expect it to follow techniques developed in New South Wales to ensure consistency across the country. We anticipate that that exercise will cost approximately \$150 000.

A related issue is waste quantity. The current landfill capacity in Adelaide is being addressed by the Waste Management Commission. Concerns have been expressed by the Government in light of a number of decisions that have been made concerning existing and

proposed landfills. One result has been the establishment of what is loosely called the Northern Alliance which is, I understand, comprised of staff members of the eastern and western waste management authorities, The City of Port Adelaide Enfield, the Northern Waste Management Authority and the City of Tea Tree Gully.

The availability of landfill sites to the north in the short term is being addressed by a number of bodies at present. Over the next few days discussions will take place between State Government officers, the Adelaide City Council and the Northern Alliance (including the City of Port Adelaide Enfield) to examine the available options.

It would be premature to say much about the future of Wingfield at this time, but I believe that we need to review the positions that have been adopted by the Adelaide City Council, the City of Port Adelaide Enfield and the EPA with regard to this issue. This will be the subject of discussions in coming days. Notwithstanding the future of Wingfield, it needs to be considered carefully given its potential as a centre for resource recovery and recycling.

The infrastructure committee is also giving consideration to longer term site considerations. It is recognised that currently there are two environmental impact statements before the Governor which, if they are successful, may significantly influence where we dispose of our waste. In an approach to the Minister for the Environment and Natural Resources, the Conservation Council and the Australian Waste Management Association put forward a proposal for what would amount to the development of community supported landfills. As I indicated earlier, we are currently preparing a registration of interest. The infrastructure committee is in its infancy at present, but it is anticipated that we will put in a report within six months regarding infrastructure needs and how they should be delivered.

792 THE HON. CAROLINE SCHAEFER: With regard to the siting of landfill areas and the registration of interest, is there any such community in South Australia? It seems to me that the landfill issue falls squarely into the 'not in my backyard' criteria. Everyone recognises the need for landfill, but there is no suitable site anywhere near them. Is there such a community?—I will answer that question off the record.

793 THE HON. M.J. ELLIOTT: You raised the issue of waste composition and you mentioned monitoring. I want to raise the question of monitoring and audit. Recently, I wrote to the EPA regarding a waste incinerator. I asked whether any monitoring was occurring in respect of this incinerator. I was told that it was a requirement that once a year the company would monitor it and provide the results to the EPA. The letter went on to say that that had not actually happened but that the licence had been renewed and that the first monitoring actually happened three months after the previous licence expired. This is a waste issue. What do you intend to do about the monitoring of dumps in terms of the composition of waste? I understand that there will be a level of self-monitoring, but what will you do to audit that self-monitoring to be confident that it is reliable?—I believe that this is one of the fundamental issues regarding the future management of landfills.

794 That is why I asked the question?—I believe that we should be working toward the stage where no waste goes directly to landfill. The EPA will look at a review of the waste management policy in terms of the development of strategies. One of the things that the waste management policy needs to look at is, effectively, a choke between the waste producer and the landfill. For a number of reasons, we will look at long haul landfill and aggregation of waste for long haul. One of the general concerns of the community and probably everyone is the nature of the material. If you have such a choke, you have the chance to assess the quality of the material. More importantly, you have the capacity to start recovering resources. It must be looked at as a total system.

It raises questions about vertical ownership, whether people should be in transport, resource recovery and landfills. If they are, there must be some sort of independent verification of the types of materials that ultimately go to those facilities.

795 When do you think that recommendations will be made regarding those sorts of issues?—I am talking within the Waste Branch at the moment, but I would think that we would like to see that in place by the year 2000.

796 As we are about to set up new dumps, to some extent will not the horse have bolted in terms of vertical integration and in terms of what the intermediate stages might be if you have approved a couple of megadumps which may work in a different way from the way you might ultimately recommend?—In the end, with the landfills that we are talking about there will be that aggregation step anyway. If one starts to look at the way in which environment protection policies are developed, with the best will in the world we cannot produce them before the middle of next year simply because of the preparation and consultation process. Obviously, we will also have to go through a consultation process with industry during this period. Ultimately, certainly in respect of landfills that we would expect to be operating within that time frame, you will see that industry will have to aggregate. We would certainly be pushing towards the resource recovery step. The auditing step may be an additional burden, but I think there is no reason why it could not be imposed.

797 Would it be possible to put on the record the issues that you think will need to be addressed? For instance, you have said that you expect that there will be public consultation. You have not defined how that will work, but you have identified that as an issue. Is it possible that these key issues that are likely to be addressed, such as monitoring and audit and something happening in the middle of the chain, etc., can be identified as areas where action is likely to take place in the longer term, even if you cannot be precise? That at least would enable the industry to see those matters as identified issues that will have to be addressed so that the industry can start thinking about them?—I am giving a talk to the Waste Management Association tomorrow night about the review of the policy. Those issues arise in the preparation of the policy. Under the Act, we are required to advertise that the policy is being reviewed, and the issues to be reviewed will form part of that advertisement. We must look at

how we resource this whole exercise. It is a fairly mammoth one, but I expect that to be advertised within the next month, and the advertisement will set out those issues.

798 MS HURLEY: We know that at least two large dumps are proposed, and I know of other smaller proposals. Do you have a view as to whether it is better to have large landfills that service large chunks of the metropolitan area or smaller dumps dotted around the metropolitan area in terms of both distribution and the cost efficiency of having smaller dumps versus larger dumps?—I feel that fewer is better in this case in terms of both monitoring and economies. However, above and beyond that, whichever one we have, wherever possible there should be some sort of cut-off lifetime so that people see some light at the end of the tunnel. It gets back to the social justice issue in many ways. Particularly if a landfill has not been invited into a community, it would seem unreasonable if you are an adjacent landowner that for, say, the next 30 years you will be a neighbour of that landfill. I think it is probably more bearable if it has a life expectancy of, say, 10 or 15 years.

799 The current procedure is that someone who wants to use a site for landfill can pick any land and make the relevant application, and that is it. Is there any value in the State's identifying potential dumps, especially in the light of planning purposes, and saying that these will be the only possible sites?—I think that would be a really productive outcome of the infrastructure committee. It is beyond the next generation of landfills as to where we would expect them to be sited. Perhaps I am trying to get too much out of the ROI process, but it would be nice if we could do it as part of that.

800 THE HON. T.G. ROBERTS: Do you not find it difficult taking a snapshot to get your strategy started when you have a whole series of rolling applications that are putting pressure back onto the EPA and the local government councils and committees to remove vested interests so that you can get your plan off the ground? You said that you were waiting for the outcome of two environmental impact statements to determine your future direction, but we are receiving submissions from communities saying that sites are inappropriate and that there are more appropriate sites. There is general agreement about some sites. Would you like to comment, because it seems to the members of this committee that that will be important in terms of how we report on some of the current problems associated with perhaps bad consultation processes or bad site selections? We still have not made a decision on that. Can you comment on that? Is it making your job difficult to get your clean green start according to your new principles? Will they be compromised before they get a chance to work? If the environmental impact statements come down in support of the siting, will you accept them reluctantly or willingly?—In an ideal world, it would be nice to start with a blank sheet. It is not an ideal world. Depending on the results, if they are successful, we have to make sure that the steps that I was talking about earlier in terms of independent verification and in terms of operational standards and resource recovery are put in place. Ultimately, all our aims should be to marginalise the need for landfill. We talk about waste hierarchy, and waste landfill is an important part of it. We must reach the stage where landfill is not the most important part of it. My view is that, for those companies that are looking at commercial longevity in the waste industry, it should be the resource recovery step that they are looking at. If we put chokes in

the way the waste is treated and processed, with secondary resources taken out, in the long term that is where the commercial opportunities exist.

801 How much is the recycling argument being used as a sop to present a good face just to get the landfill back? That is difficult for us to work out?—It is an area where one can have a degree of cynicism but, again, we have to put the provisions in place to make sure that the commitments are a little more genuine.

802 Do you think that those commitments should be advertised in the community? It appears to me that most people, including a lot of our colleagues, are basing their assessments on past methods of landfill operations and the community's assessment on the role of landfill, including the campaign against the Highbury dump, are probably a decade old. What role are the proponents playing in trying to change the views that people in the community have? Is there a role for the EPA or the Government in that? Who is it up to to sell the process, namely, that you can eat your hot buttered crumpets at all points within the process?—We are a little bit disappointed with the intellectual efforts that the waste industry puts into this area. Mr MacMullen could talk more about where we see landfill management going. Beyond the year 2000, we are looking at effectively having a choke on landfill. We would like to see green waste and demolition waste going out of the waste stream by that time. In the longer term, and I have been touting it as a vision, we would like to see all treated waste going to landfill by 2003. We are effectively deactivating waste. One of the concerns is when we start to look at cross generational equity. In other words, we pour this garbage into a hole in the ground and say to our grandson or granddaughter, 'You look after it for us.' Ideally we should get to the stage at which, when we leave a landfill, it is benign. If we can get to that stage, if we can get the community on side on that, we can draw landfills back into Adelaide where the material can genuinely be used for landfilling rather than just disposal, as it is at the moment.

803 MR ANDREW: Without focusing too directly on the landfill geography, there has been some criticism about the EIS process itself. Does the EPA have a position with respect to the current process in terms of your current satisfaction or culpability in how the process is working, or do you have any specific suggestions, recommendations or comments as to whether it should be improved or may be improved?—(MR MacMULLEN) It is fair to say that the process has not worked as effectively as most people involved in the process would like to see it happen. It is my perception from many years experience in development control, particularly from the local government perspective, that the EIS process as it stands is more suited to certain types of development than others. For example, a major hotel or resort development might fit into the process more comfortably. The difficulty with landfill, for example, is that we are looking at activity which continues over a very long time and, during that time, a lot of changes will take place in waste management technology. The form of the land will change over a very long time rather than a very short time.

I believe that there are problems with the existing process. They will not be easy to solve, so what we are looking at from our point of view is setting the guidelines and ground rules more closely so that projects that are submitted for consideration have been sifted

out to a certain extent and the EIS process can be targeted more closely on significant environmental factors rather than on the broad range of issues that currently get dragged into the EIS net and make the process very expensive and very complicated.

The current process requires communities and State agencies to invest huge amounts of money into participating in the process. The cost of that is not carried by the proponent and it is conceivable that a major project could go through an EIS process, eventually be approved, but not proceeded with, and that has required the community in this State to invest huge amounts of money in participating in that fruitless project. Likewise, the argument could come from the development side that a substantial amount of money is spent on an EIS process which might then fall over because it is not approved in any way at all at the end of the process. There are concerns in our industry about the suitability of the process as it currently stands.

804 THE HON. M.J. ELLIOTT: The scientific integrity of an EIS process has caused me concern, in that the proponent has the responsibility of processing the information and that processing does not really happen in an open forum. Information comes in. The synthesis of it and the relative weight given to things is actually done by the proponent and, at the end of the day, DHUD looks at it but there does not seem to be any way of ensuring that there is genuine scientific investigation of issues. Can you comment on that?—I agree that is another flaw in the process and I alluded to it in my comment about the amount of money that the State is required to spend on analysing the EIS documents, particularly highly technical and scientific material. It has often been necessary for the EPA to engage other consultants to review the technical and scientific information contained within an EIS. I am not aware of instances where there have not been contrary opinions on the science.

805 Who makes the decision when there are contrary opinions? The EIS process leaves it to the proponent to prepare the documents?—The documents are prepared by the proponent, who often attempts to refute any scientific arguments that come up in the process. The final analysis of the EIS is really the responsibility of the Government and it is subsequently the Government and Cabinet's decision on that. Essentially it is in the hands of those people to weigh up the contrary arguments. It is a difficulty, because of the perceived lack of independence of the initial document. We should rely on the professional integrity of the consultants in that, but it is clearly an issue of concern, because it is so complex and technical that it requires additional investment on the part of the State and particularly community groups who are attempting to counteract some of these issues. Obviously, they have neither the expertise nor the financial wherewithal to go into it in that degree of detail. It is a problem that somehow needs to be addressed.

Some of the issues I was going to talk about have been addressed, but I will try to summarise them. One of the issues that has been raised is monitoring of landfill performance. It is fair to say that landfill performance monitoring did not really commence until the South Australian Waste Management Commission took control of waste disposal activities in the State some years ago. During that time some critical monitoring factors were

introduced into the major landfills, in particular, monitoring of surface water and ground water. They were the two factors for which specifications were introduced and monitoring programs commenced on the major landfills. These monitoring requirements were subsequently incorporated into most major landfills after an introduction period in which the commission essentially took responsibility for organising, monitoring and coordinating it. That responsibility has now been passed onto the licensees, although it is not a universal program: it is really applied only to the major metropolitan and some major rural landfills.

A number of landfill sites are still operating which preceded any stringent planning and environmental controls, so it has been difficult to set up an ideal base for monitoring that, given that there has been the potential for background contamination to interfere with the validity of the results. Wingfield is an example where a lot of activities in the area may have caused contamination of ground water in particular, and it is difficult to determine the source and origin of, and responsibility for, some of those detected contamination factors. Work is under way in setting up more stringent monitoring requirements and in particular transferring the sole responsibility for paying for the monitoring onto the licensees. At the moment, some costs are borne by the State in reviewing the monitoring results and that sort of thing. I will go into the future requirements.

Landfill gas is a recent factor in the spectrum of monitoring. South Australia is a pioneer, and we now have monitoring systems for landfill gas in place on a number of our major landfills at which the landfill gas is extracted and converted to energy. It is likely that gas monitoring and control will be formally required on most major landfills in the near future.

806 Would that include landfills that are now closed?—Yes. We are currently looking at a number of landfills which have been closed for some time and negotiating with the landfill owners on what has to be done in those instances. Obviously, there is some resistance to doing things like that, because there is no income stream from those landfills any more, but from our other sites we are now aware of the importance of managing landfill gas for quite a long period of time. South Australia is traditionally a low rainfall environment in the broad sense, and consequently the period of degradation of organic waste and gas production arising from that is fairly lengthy. We are looking at one landfill now which, on the surface of it, one would expect not to produce any significant quantities of gas after a period of about 35 years, but it is still rather significant. Obviously, this raises concerns. There has been no formal litter, odour, dust, noise or waste composition monitoring, and surveillance has been reliant on EPA or Waste Management Commission inspections and on complaints from communities and councils. Certainly, that is an area where we expect to see new and ongoing landfills achieving a much higher standard.

In the generation of new landfills and in continuing landfills we are looking at the requirement for environmental monitoring and reporting systems as part of an overall environment management system. In the past, landfilling has been treated as not so much an industry but just a relatively low key activity. Our objective is to bring the waste

industry to a proper industry standard which recognises inputs and outputs into and out of the system and the responsibility for managing and reporting on those inputs and outputs and which also fully recovers the cost of managing and reporting. Certainly, many operators within the industry at the moment believe that the EPA's role is to tell them what to do and what not to do rather than their managing their industry themselves and paying for the cost of that surveillance. It is our perception that this sort of monitoring will be required to be undertaken by independent specialist organisations that will report both to the EPA and to the licensee, so that there will be dual reporting, which will place responsibility on the industry to attend to those issues once they are brought to their attention. The number of proposals for new and existing landfills have indicated their attempt to introduce such environmental management systems into their operations, and this is quite a good sign. The industry is already getting the message that the current status of their operations is not satisfactory.

Major community concern has been identified over the matter of leachate management in a number of the landfills we have been looking at. The essential features for effective landfill leachate management are minimisation, containment, collection, control, treatment and disposal of the leachate. These are basically engineering aspects of landfill design which can only be incorporated in a new landfill. It is very difficult to handle that level of engineering in a pre-existing site which, for example, does not have a lining system at the base. So, these sorts of design standards are relevant to new sites rather than existing sites. One issue that has been raised recently is the integrity of liners. In all the new landfill proposals, communities have particularly questioned the integrity of lining systems. It is now recognised world wide that all lining systems will leak in one form or another. The period of time involved and the uncertainties in relation to the nature of either natural or synthetic materials used in liners have now been acknowledged. It is understood that, in time, leachate will penetrate through the liners, and the proponents' consultants obviously realise this.

It is also recognised that the leakage of leachate through the lining system can be attenuated to a certain extent, that is, the potential contamination arising from that can be attenuated as a result of the passage of that water through soil and fractured rock, and those sorts of things, where physical and chemical interactions occur. The EPA takes a fairly conservative view in that it acknowledges that liners do leak and that attenuation in the aquifer does occur. The EPA requires the proponents to demonstrate, through modelling of the system, modelling of the leachate movement and also monitoring of the ground water between the landfill operation and the edge of their boundary sites, that ground water beyond their sites is not being compromised.

That is a major issue in that it does put constraints upon the site. For example, if a site is a large quarry abutting a public road, then there is no distance whatsoever for that attenuation to occur. However, if the site is surrounded by a rather large buffer zone, then it does make compliance with that requirement relatively straightforward. It also enables preventive or remedial measures to be taken in the event that monitoring of the physical environment detects contamination that is likely to extend beyond the boundary, that is, that

space provided in the buffer zone allows remedial action to be put in place, such as some physical engineering works, interception, treatment, or whatever.

We are moving fairly rapidly to the concept of sustainable landfilling, and Mr Harvey has already touched upon this in the early discussions. For a landfill to qualify as sustainable it must meet the following objectives: first, that the contents of the landfill be such that outputs, for example, leachate landfill gas, are returned to the environment in a controlled and acceptable way, and that has now been recognised as a requirement for engineering of landfill sites; and, secondly, that the waste left in the site should not pose an unacceptable risk to the environment, and that the need for active after care and monitoring should not be passed onto the next generation.

The third feature of a sustainable landfill is that access to and use of resources, such as minerals or ground water, should not be compromised. In addition, it is desirable that future access to resources within the waste stream should not be precluded. What I mean is that certain materials are currently being landfilled because, although they are easily recovered, there is no economic use for them at the moment. We are suggesting that a sustainable landfill would require these materials to be separately located within a landfill so that, in future years, they can be excavated and used by future generations. Sustainable landfills are highly site specific. It is a bit difficult to go into detail about design criteria but the principles are important.

It is a requirement for the sites to be specifically identified and designed to comply with those requirements. Another aspect of sustainable landfills, which has been popular until relatively recently (the Highbury proposal is an example), is that they should be process-based landfills, that is, rather than pretreating the waste or segregating the waste, the waste is to be put into the ground and then accelerated biodegradation is to occur through a bioreactor leachate recycling process. That is probably the first generation of sustainable landfills, however, that is now being rapidly overtaken by pretreatment or prestabilisation of waste, which more rapidly achieves that goal of sustainability within the landfill.

Segregated filling is one of the ways in which we can achieve resource security. In respect of some of the details of landfill design, it is difficult to be too specific. It is clear from what Mr Harvey said previously that site geography and geology will have a critical effect on landfill design features and, as we have both suggested, one of the most significant factors will be the separation or buffer distance between the activity of deposition and the nearest sensitive land use. In the past, it has been recognised that residential areas are relatively sensitive land use, and quite a lot of the opposition to landfills to which we have been recently exposed has been based on that conflict between residential amenity and landfill activities.

We also recognise that significant concerns are held by pastoral and agricultural land users and, in particular, the risk of contamination from litter and the control of fire. Ideally the buffer should be sufficient to render adverse impacts at the site boundary of

no consequence, even, for example, in the event of extreme weather events. Other design aspects will be dependent upon specific factors including soil types, landfilling methods and the nature of the waste stream. For example, one current proposal is the balefill proposal, which achieves a very high standard of litter control but at the expense of rapid biodegradation.

It will probably take a balefill much longer to stabilise than a conventional landfill. It is often a balancing act between those sorts of parameters. High standards of road access within and external to the site should also be provided and maintained, as well as facilities such as wheel washers and weighbridges to ensure that waste and soil is not tracked onto public roads, and also that accurate data is maintained. It is critical that appropriate design standards be used for landfills because underdesign of the engineering aspect will lead to increased risk of failure and overdesign will lead to excessive costs being incurred by the community. Many aspects have been dealt with in one form or another in the options paper prepared by the Office of Environment Protection and issued prior to development of the strategy. That document led to the strategy and was tabled before the committee last year. They are the main issues I want to talk about at this stage.

807 MS HURLEY: With respect to accelerated biodegradable dumps, evidence given to the committee indicates that existing dumps do not seem to have caused many problems to the environment, and we have had some evidence that accelerated degradability does not create any difficulty. Is there any benefit then in going down the reasonably expensive route of separating out and treating our domestic waste?—That is achieving a balance between overdesign and underdesign. We want an optimal design. I would question whether traditional landfilling has been all that acceptable. I am not aware of any large metropolitan landfills that have not been a problem or are still not a problem. Even the relatively simple matter of litter control has been a serious problem with all our sites. We are concerned about odour control, which results from the instability, particularly of the food fracture, of the waste stream, and we are aware of other difficulties as a result of our leachate and ground water monitoring. I believe that evidence locally and trends from the rest of the world justifies our heading down the track of prestabilisation in one form or another, even if it is only in the very early stages of ensuring that good quality material does not go into landfills.

Mr Harvey talked earlier about the diversion of building and demolition waste, for example. There is not a lot of merit in that sort of stuff going into an unusable state of a landfill. If it can be suitably used to genuinely rehabilitate land and turn it into some other productive use, so much the better. In the past there have been instances where that sort of activity has been perhaps well-intentioned, but not well organised, and we have had some difficulties there. However, our belief is that by setting appropriate standards for that sort of activity, two things can be achieved: first, rehabilitation of some degraded land; secondly, retention of the resource value of that material, rather than just throwing it in an unusable state into a hole.

808 THE HON. T.G. ROBERTS: Are you satisfied that the current hydrological information is adequate for all areas and the variations which are occurring now? I am not saying that the greenhouse effect is impacting on the ground water supply too much now, but it is something that may have to be considered in the future. It appears to me that some of the variations are difficult to monitor, or even to test and gauge, because little or no information has been collected. Are you satisfied that there is enough being done to gain that information to get all your other variables right so that the important factor of leachate is accurately assessed and that there cannot be any mistakes made in the future?—Hydrogeology is probably one of the most complex issues. Certainly, from all the projects that we have been looking at recently, yes, there is a shortage of reliable data, and I think this is probably one of the contributing factors to the divergence of expert opinion; that with a relatively limited data sample you can come up with a number of possible explanations. I suppose this has been vindicated, to a certain extent, by some of the recent decisions of the authority where concerns were expressed in relation to the uncertainties of the hydrogeology of the Adelaide City Council Wingfield landfill. As a result of that decision, additional sampling and testing has been undertaken which has brought to light results which were not expected, and that has now opened up the need for even more investigation of the hydrogeology of the Wingfield area. So, I think that in itself probably confirms those sorts of difficulties: the data has in the past not been adequate. It is very expensive data to obtain, which probably explains why people are reluctant to do too much work. However, I believe that in all of the new proposals with which we have dealt we have stressed the need to obtain enough exploration of the hydrogeology to confirm their assertions about the validity of the site.

809 One can obtain reasonably accurate averages of wind, speed and weather, but ground water flow, and tidal rises, et cetera, become much more difficult. Do you think that we should be erring on the side of conservatism and caution when feeding those variables in so that there is more encouragement for trying to get in a benign landfill material before it goes in?—The EPA has taken a precautionary approach in accordance with the Act. It is also recognised overseas, where there has been a move in some areas, because of the uncertainties associated with geology and hydrogeology, to move towards above ground land filling of pre-stabilised material. The advantage of above ground activity is that it is much easier to monitor what is going on at the base of the landfill. If you are filling old quarries, for example—which have very complex geology—then it just increases the variables and increases, I suppose, the risk of not detecting some of the important phenomena.

810 MR ANDREW: Referring to some of the leachate issues raised by Mr Roberts, where does the software come from, in terms of being utilised to assess those practices at the moment: and is it international software, or are we developing that in terms of local conditions? Do we compare with interstate authorities in regard to that type of assessment?—Yes, the modelling is essentially from overseas and most of it that is currently used in Australia is sourced from the United States and, in particular, the United States Environment Protection Authority. Obviously, with those sorts of programs it is necessary to calibrate them for Australian conditions and quite a lot of work has been done interstate, in particular, on testing those models against Australian conditions. It raises an issue, though—and we often

question this with the consultants for the developers. We require them to be able to demonstrate confidence in the black box. However, I am reasonably confident in the validity of the United States EPA help model, for example, provided that the overall parameters are consistent. Most of the United States criteria are extremely stringent, for a number of reasons, one of which is that quite a substantial area of the United States is reliant on ground water supplies for domestic consumption—much more so than Australia, for example. So, they tend to be very conservative when it comes to ground water protection, for example. However, it does raise the question to which I alluded earlier: that we need to be careful not to set standards that are unnecessarily stringent and pass excessive costs on to the community in that way. Universities interstate have also done a lot of work on calibration of that software, and the hydrogeological experts often discuss these issues amongst themselves for their interstate colleagues.

811 So, there is a fair bit of commonality in terms of interstate relations in this regard?—Certainly in the past few years there has been quite an expansion of liaison with interstate agencies, to the extent that we are aiming to achieve reasonable compatibility of standards from one State to the other for similar conditions.

812 Is there one State that takes the lead or has a focus on tertiary research institutes at the moment, in terms of giving this arena some special attention?—I think it is fair to say both New South Wales and Victoria are probably further ahead, because their population base gives them that degree of resources. However, there is also a lot of work being done at tertiary institutions, including the Griffin University in Queensland, and we use their expert resources from time to time in relation to those highly technical issues.

813 THE PRESIDING MEMBER: It is based in Brisbane?—Yes. It is also fair to say that in terms of landfill operations, Brisbane is probably ahead of the other metropolitan centres at the moment, too.

814 In relation to these hydrological studies, I understand that the Department of Mines and Energy funds the utilisation surveys: is there, therefore, a role for Government, or the EPA to be funding these studies?—I did not quite catch the question.

815 The Department of Mines and Energy pays for the surveys: should the Government be paid for this study into this hydrological area, which has more importance?—The State has already contributed significant resources to overall State ground water and surface water surveys—perhaps not to the same degree of detail as the Department of Mines and Energy geomagnetic survey, which produced a lot of evidence for sale to the miners. In this instance, the site specific data is still the responsibility of the developer. It is also one of the issues of general background information which can be used to determine areas more likely to be suitable for land filling than others.

It is certainly not as detailed as the mines surveys, but the principle is the same and the information is only there to lead towards more likely areas than less likely areas

in much the same way as the prospecting surveys have been done. The advantage the Department of Mines had with its surveys is that the technology was available to do it at relatively low cost. I am not aware of similar low cost technology to obtain hydrogeological data. You have to drill the holes, which is the expensive part. If it could be done from the air it would be easier.

816 I am interested in your comments on leachate management. Are you aware of the practices on the Olympic Games site on Homebush Bay where they are using solar pumps on strategic collecting sites and recycling it?—I have attended a number of presentations by Errol Semmler from the Olympic Games Coordinating Committee and read some papers. The Homebush Bay site is a complex and wet one. There is a lot of surface water and ground water. The other feature is the amount of money available to handle the problems. There will be a huge amount of information on management of old waste sites, particularly contaminated ones, that will be useful throughout Australia as that project continues. We certainly keep in touch with our New South Wales colleagues on those issues.

817 We were told that it was one of the chief reasons that Sydney got the games: its ability to turn wasteland into a pristine games facility?—It is interesting from an environmental management viewpoint. I was associated with that site when doing high school studies because I went to school in that area. We were given an assignment to look at the Homebush Bay derelict site and suggest what might come of it in future generations. We did not pick the Olympic Games. I keep in touch with my New South Wales colleagues on those issues.

818 THE HON. T.G. ROBERTS: What was your prediction?— I thought it would be used for residential and recreational activities, which is not far off the track.

819 THE PRESIDING MEMBER: It is phenomenal?—It will provide useful information for Australia and overseas on contaminated sites.

820 It has contamination, a quarry and the yellow tree frog?—It is a fascinating site. We can be proud of the achievements there. I will be surprised if it does not work well.

821 Thank you for coming back as it finalises our hearings.

THE WITNESSES WITHDREW

THE COMMITTEE ADJOURNED