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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of an

ANIMAL HEALTH LABORATORY

at

Geelong, Victoria

(SIXTH REPORT OF 1974)

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

ANIMAL HEALTH LABORATORY
GEELONG, VICTORIA

REPORT

By resolution on 31 July 1974, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report the proposal to construct an Animal Health Laboratory at Geelong, Victoria.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal submitted to the Committee is for the construction of an Animal Health Laboratory at Geelong comprising seven building which may be classified as being with or without microbiological security. Those with microbiological security comprise a large animal accommodation building, a laboratory wing, a building to house scientific services, a small animal breeding building and a vaccine production unit. The buildings without microbiological security comprise an administrative building and a services building. Two residences, for the caretaker and resident engineer, a gate house and an animal holding area complete the complex which is to be served by internal roads and car parks. The site, which will require considerable filling, will be suitably landscaped.

2. The work when referred to the Committee was estimated to cost $56 million. During the hearing the Committee were informed that a complete reappraisal of the whole project had been made and the revised estimate is now $67 million.

THE COMMITTEE'S INVESTIGATION

3. The Committee received written submissions and drawings from the Commonwealth Scientific and Industrial Research Organization, the Departments of Health, Agriculture, Northern Development and Housing and Construction and took evidence from their representatives at public hearings in Geelong on 9, 10 and 11 September 1974. We also took evidence from representatives of four local authorities endorsing the proposal, and one private citizen of Geelong who sought information on the likely effects of the Laboratory on the local community. Written submissions from the Australian National Cattlemen's Council and the Australian Veterinary Association supporting the proposal were received. A written submission from the Geelong Environment Council objecting to the use of the land was also received.

4. Prior to the public hearing, the Committee inspected the proposed site.

5. The Committee's proceedings will be printed as Minutes of Evidence.

THE NEED

6. Australian Livestock Industry Australia is now the world's largest exporter of meat and has an increasing trade in livestock, both in numbers of animals exported and in the range of countries prepared to import Australian livestock. The annual value of livestock production now exceeds $3,000 million and exports are valued at approximately $2,000 million. Not only would much of this export trade cease, but the whole of Australia's livestock industry could be in jeopardy if there was a serious exotic disease outbreak in Australia, in particular foot and mouth disease. If Australia possessed its own diagnostic facility, e.g. a maximum security laboratory, importing countries might be expected to reduce considerably the period during which imports from Australia would be banned. The quarantine service has so far proved an effective barrier against the accidental introduction of exotic diseases, but no quarantine service, however efficient, can hope to provide an absolute guarantee against their entry. Australia can no longer rely to the same extent on its physical isolation to help keep out exotic diseases. People are now flying to Australia from virtually every country in the world in less than forty-eight hours. In the last ten years, the number of people arriving from overseas by air has increased from less than a quarter of a million to more than one million and by 1980, it is expected to reach two million. As the number continues to increase each year, the risk of exotic disease penetrating our quarantine barrier inevitably becomes greater.

7. Present Arrangements for Exotic Disease Diagnosis The essence of successful containment of an outbreak of exotic disease is early recognition in the field with speedy confirmatory laboratory diagnosis and continued monitoring of the susceptible livestock to determine and confirm eradication success.

8. With the exception of swine fever, rabies, equine encephalomyelitis and Newcastle disease, Australia is completely dependent on the assistance of overseas laboratories for the diagnosis of other exotic diseases. These diseases, against which Australia has erected formidable quarantine barriers, include foot and mouth disease, vesicular exanthema, vesicular stomatitis, rinderpest, African swine fever and blue tongue.

9. Arrangements have been made with a number of reference laboratories both in Australia and overseas for the acceptance of specimens from cases of suspected exotic disease in this country. These arrangements are in the nature of a gentleman's agreement between the directors of the various laboratories and the Quarantine Division of the Australian Department of Health. In no sense is there any contractual agreement by which any overseas laboratory is committed to accepting specimens on a continuing basis from this country.

10. Experience in the past has not always been fortunate and on at least one occasion suspected rinderpest specimens sent to a world reference laboratory were destroyed because the laboratory would not handle them.

11. Arrangements need to be regularly confirmed, reviewed and clarified with a number of established world reference laboratories. Contact with some of these laboratories is infrequent and there is always the possibility that co-operation may be affected by changing circumstances e.g. politics, war or communications. On 24 May 1974 a routine reconfirmation of co-operation

was sought by the Department of Health. Up to the date of the public hearing, replies had been received from six of the ten co-operating laboratories.

12. The present diagnostic arrangements have an obvious potential for delay during which period of time there may be an extension of a disease outbreak or infected animals may have to be kept alive until demonstrable, recognisable symptoms of disease develop.

13. During the course of any exotic disease, unless the outbreak is confined to a single incident, it is essential to monitor the infectious agent to identify the strain or strains present, to check changes in antigenicity following passage through susceptible stock and to determine when the agent has been eliminated. There are no means of determining in advance of an outbreak the number of specimens required to be taken to ensure maximal efficiency of an eradication campaign. It would be unwise to assume that any overseas laboratory could handle the optimum number required and Australia must be prepared, during the course of a prolonged outbreak, to either accept a reduction in the number of specimens examined or set up a makeshift organization in an existing laboratory. Neither of these alternatives is satisfactory.

14. Of equal importance would be the examination of specimens, possibly taken from stock over a wide area and for a considerable period of time, to finally confirm eradication and to enable an official announcement to be made to this effect. This could be of critical importance in ensuring a resumption of overseas trade.

15. Some countries impose prohibitions on the importation of livestock products from areas in which certain specified diseases are present. The example of greatest importance to Australia is that of the United States

which places restrictions on imports from countries where contagious bovine pleuropneumonia is present. Despite the official declaration in 1973 of freedom of Australia from this disease, America is not yet prepared to accept livestock from Australia and requires tests for contagious bovine pleuropneumonia on donor bulls for semen to that country. In an effort to convince the United States authorities that Australia is free of this disease, statistics relating to testing for disease vaccination and monitoring at slaughter houses have been provided for consideration by veterinary authorities in the U.S.A. It would be expected that similar substantiation would be required for other serious diseases if introduced and eradicated.

16. The establishment of an Animal Health Laboratory would change this situation in respect to introduced exotic disease and the likelihood of delay and disruption in an eradication campaign due to a breakdown in communications or lack of overseas laboratory facilities would be minimised.

17. It is anticipated that the Laboratory would hold all diagnostic agents, under secure conditions in advance of an outbreak and would prepare all diagnostic reagents, such as anti-sera, ready for immediate use. However, there is no intention of using the virus of foot and mouth disease, even in the secure conditions of the Laboratory in advance of an outbreak.

18. Exotic Disease Control The Australian Government and the States have a joint responsibility for disease control. Planning for the control of introduced exotic diseases has been co-ordinated by the Australian Agricultural Council and its Standing Committee on Agriculture.

19. In 1952, the Council established a Foot and Mouth Disease Committee, which is now the Exotic Diseases Sub-Committee of the Veterinary Committee of the Standing Committee on Agriculture. The Exotic Diseases Sub-Committee's

responsibility is "to consider and report on the legislative, financial, administrative and technical measures for eradication of serious exotic diseases of animals which at some future date may penetrate the quarantine barrier". This Sub-Committee is essentially a planning and co-ordinating Committee with assistance from two technical expert panels of laboratory workers, one on the diagnosis of exotic diseases and the other on entomology of relevance to animal disease.

20. In addition, the Australian Agricultural Council has set up a Consultative Committee with the Assistant Director-General (Animal Quarantine) of the Australian Department of Health as Chairman, and the Chief of the Division of Animal Health C.S.I.R.O., and the Chief Veterinary Officers of the affected States as members. This Committee which meets only in the face of an exotic disease emergency, is responsible for making judgments regarding the presumptive and confirmatory diagnosis of outbreaks of exotic disease of livestock for the purpose of invoking the Commonwealth and States financial arrangements for combating outbreaks. This Committee would also be responsible for determining at what point an exotic disease e.g. blue tongue, might be beyond eradication and should be considered as an endemic disease throughout the continent.

21. Under the aegis of the Australian Agricultural Council, master plans, adaptable to the physical and husbandry situation in each State, have so far been prepared for control and eradication of eleven exotic diseases. These are the diseases most likely, under present conditions of trade and population movements, to be introduced into Australia.

22. Vaccine Production Livestock can be rendered immune to most, but not all, exotic diseases by vaccination. Although vaccination of susceptible animals might sometimes be used to help eradicate an exotic disease, it would

in most instances, only be used as a control measure when eradication measures proved unsatisfactory.

23. Stockpiling large quantities of vaccine in Australia, to have on hand in the event of an outbreak of exotic disease, is not a practical solution. The most successful vaccine is usually that prepared from the virus type or sub-type isolated from the outbreak, so that it would be necessary to stockpile large volumes of a whole range of vaccines and maintain them permanently refrigerated for use against a single disease. Furthermore, in the case of foot and mouth vaccine, the effective storage life is only about six months.

24. The Commonwealth Serum Laboratory is currently building a high security facility that will enable it to produce live attenuated blue tongue vaccine for use against this disease in the event of it entering the country. These facilities will not be suitable, however, for the production of foot and mouth vaccine since this involves handling large quantities of live, highly virulent virus. Because of the risks involved, foot and mouth disease vaccine production requires facilities with maximum microbiological security.

25. At present, the only place in the world where Australia could have an acceptable foot and mouth disease vaccine prepared to combat an outbreak would be Pirbright, England. Too much reliance should not be placed on the availability of these facilities. Pirbright has no over-riding commitment to Australia and would be in no position to consider an Australian request for foot and mouth disease vaccine if it were committed to coping with an outbreak in Britain. In addition, there is no guarantee that Pirbright would be prepared, at some future date, to manufacture vaccine for Australia if it involved a strain of foot and mouth disease virus not previously encountered in Britain or Europe. The only way in which Australia can

guarantee the availability of vaccine, in the event of an outbreak of foot and mouth disease is to have its own maximum security vaccine-producing facilities.

26. Vaccine Testing Before a vaccine can be used in the field against an exotic disease, it must be tested for safety and potency. This applies whether the vaccine is produced locally or imported from overseas. The necessary tests involve challenging vaccinated and susceptible animals with the virulent form of the virus. These tests can only be carried out in the complete safety of a maximum security laboratory.

27. Potency testing cannot be done overseas for a variety of reasons, an important one being that livestock vary in susceptibility from region to region and from breed to breed. For example, a vaccine for a rinderpest which is effective in India, kills a high proportion of cattle in Japan, while a rinderpest vaccine effective in Japan does not protect a large proportion of cattle in India. Similarly, the vaccine made in Australia for the recent successful eradication of contagious bovine pleuropneumonia was far too virulent to be used with safety in cattle in Africa. Moreover, deterioration in transit can only be detected by potency testing on arrival.

28. Bureau of Animal Health The Committee were told that a Bureau of Animal Health will be established within the Department of Agriculture to be responsible for all animal health services conducted by the Australian Government with the exception of animal quarantine.

29. Although the States are individually responsible for disease control within their borders, the Australian Government also has a responsibility and an interest in the control of animal diseases of major economic importance. The need for a co-ordinated approach to animal disease problems has been recognised for many years. Diseases do not respect State

boundaries and for this reason there has been steady pressure from the States for the establishment of the Bureau to help co-ordinate disease control programmes.

30. The Animal Health Laboratory is an essential part of the back-up for the Bureau and without such a facility the proposed Bureau would not be in a position to carry out many of its functions efficiently.

31. Cost of an Exotic Disease Outbreak As indicated above, if a major exotic disease outbreak occurred in Australia, e.g. foot and mouth disease, it could be confidently predicted that much of our export trade would cease immediately and would not resume until importing countries were convinced that the disease had been successfully eradicated.

32. Recent experience with foot and mouth disease in Great Britain gives an indication of the enormous economic cost of a serious outbreak of an exotic disease. In that country, the disease is eradicated by quarantine and the slaughter of affected herds without vaccination. Between October 1967 and March 1968, 500,000 head of cattle were slaughtered resulting in compensation of £26.5 million. The total cost of the outbreak including compensation, eradication and indirect losses was estimated to be between £70-£150 million.

33. In an examination of the economic aspects of the Animal Health Laboratory proposal, the Bureau of Agricultural Economics concluded that it could be a viable proposition as a result of the expected benefits arising from research programmes alone and if these benefits were combined with a disease outbreak situation, there seems to be little doubt regarding the economic viability of the proposal.

34. Quarantine Because of strict quarantine, Australia does not have ready access to the wider range of genetic material in breeds and strains available in other countries. Australian livestock industries are thus at a disadvantage in this regard. The proposed off shore high security animal quarantine station, which the Committee recommended should be located in the Cocos (Keeling) Islands (Fifth Report of 1973) will do a great deal to overcome this deficiency. It is proposed import livestock first from countries whose disease status is known and in which there is a reasonable possibility of having adequate disease tests carried out, e.g. the United Kingdom, North America and Western Europe. Imports from Africa, Asia and South America could follow only if the Animal Health Laboratory is established. It is these areas which offer the prospect of valuable new tropical cattle species.

35. The Committee were informed that it could be up to 10 years before the Laboratory becomes fully operational during which time Australia's quarantine barrier will be under pressure due to the increasing nature and ease of international travel, particularly by jet aircraft. Evidence given by the Department of Health indicated that the Department was now taking a broad view of its traditional quarantine responsibilities and, as recorded elsewhere in this report, was giving active assistance to Indonesia in combating the foot and mouth disease outbreak on Bali. In addition, the Department recognises the need for increased surveillance of Northern Australian waters and will continue its normal watch on airports and shipping terminals.

36. Committee's Conclusion There is a need to establish a maximum security Animal Health Laboratory to ensure the prompt and reliable diagnosis of exotic animal diseases. The proposal is economically justified.

BACKGROUND TO THE PROPOSAL

37. In 1964, at the instigation of the Australian Department of Health, a representative of the Food and Agriculture Organization of the United Nations visited Australia to investigate and report on the preparedness of Australia to cope with exotic diseases of livestock.

38. The report recommended that Australia should establish its own maximum security laboratory to provide the diagnostic and vaccine testing facilities that would be needed in the event of a major exotic disease penetrating Australia's quarantine barrier. The report also recommended that the laboratory should have the capacity to produce foot and mouth vaccine for use in an emergency.

39. An Interdepartmental Committee was formed to report on the proposal to establish an exotic diseases laboratory in Australia. Although noting that it was unwise to work with foot and mouth disease virus or any other exotic disease organism in advance of an outbreak in Australia, the Committee did, nevertheless, agree that it would be advantageous to establish a laboratory that would not only be capable of diagnosing exotic diseases but also provide specialised instruction for veterinarians, test material from an animal quarantine station and that could carry out research on indigenous Australian animal virus diseases. These recommendations were in general agreement with those of the Standing Committee on Agriculture and the Commonwealth and States Veterinary Committee who in 1970 had recommended the establishment of both a maximum security laboratory and an animal quarantine station. The Australian Agriculture Council subsequently accepted the recommendations and formed an 11-man Advisory Proposal Committee consisting of representatives of C.S.I.R.O., the Departments of Health and Housing and Construction to determine both the feasibility of the proposal and the

approximate cost of establishing and operating a laboratory. Following a visit overseas a Proposal Evaluation Team published a detailed report in 1972. This formed the basis of a joint submission to the Government in October 1972 who approved in principle the establishment of an Animal Health Laboratory to be administered and operated by C.S.I.R.O. At the same time, the Government noted that consideration might be given to selecting a site for the Laboratory in a country centre.

40. The Proposal Evaluation Team concluded that the ideal site should be:-

(a) about 25 to 30 acres in extent and preferably of similar dimensions in both directions;

(b) located on ground with sound load bearing qualities for building structural purposes;

(c) accessible to all major urban services such as power, water, sewerage and gas;

(d) remote from susceptible livestock (cattle, sheep, pigs and goats) by a half mile, preferably one mile. This would mean being remote not only from farms, but also from racecourses, showgrounds, abattoirs and saleyards;

(e) within reasonable distance of a major university containing well established departments of microbiology and biochemistry. There would also be some advantage in being close to a university with a veterinary school;

(f) within reasonable distance of other tertiary education establishments, such as a major technical college;

(g) within a city containing a major airport to ensure rapid transport of specimens and materials should an outbreak of an exotic disease occur in a part of the country remote from the Laboratory;

(h) within a reasonable distance of residential areas.

41. The requirements of locating the Laboratory in the middle of a livestock-free zone needs some amplification. While at first glance it might appear that the selection of a site for the Animal Health Laboratory would be critical to its security, such an assumption pre-supposes that no matter what precautions are taken, there will always be a risk of dangerous micro-organisms escaping. However, the microbiological security of the Animal Health Laboratory should not be dependent upon its location. The Committee were told that the design concept was such that the Laboratory could operate in any area without producing hazards to surrounding livestock.

42. While the Proposal Evaluation Team considered that a livestock-free zone around the Laboratory was not essential to its security, they felt that, in order to conform with the accepted practice in similar institutions overseas, and for reasons of public confidence, management psychology and emotional reaction, the Animal Health Laboratory should not be located adjacent to livestock populations whether these be associated with farms, abattoirs, saleyards, showgrounds, racetracks or trotting tracks.

43. The principle of having an animal free zone surrounding a maximum security laboratory stems from the time when the techniques of ensuring microbiological security were either non-existent or only poorly developed. However, even with the marked improvements that have occurred in these techniques over the past twenty years, animal free zones around such facilities have still been retained. Although, as in the case of the Animal Health Laboratory, these zones may not be essential to the security arrangements, they do provide the operator of a maximum security laboratory and the public with an additional safeguard which helps to boost confidence in its security. In particular, the location of the Laboratory in a rural

or semi-rural area could arouse misgivings among livestock owners nearby and should an outbreak of an exotic disease occur in the district, the Laboratory whether at fault or not, would certainly be blamed.

44. Selection of Geelong Site Having noted that the location should be in an area remote from susceptible livestock and within easy access to a major airport and a reasonable distance to a university etc., the ideal location of the Laboratory would be within a city such as Melbourne, Canberra, Brisbane or Sydney and a number of sites in these areas were investigated. The only city other than a capital city which was considered was Geelong, as it also nearly met the criteria. On the basis of the examination of the large number of sites and following discussion with the various planning authorities in several cities, a proposal document went to the four sponsoring Ministers in June 1973 who determined that the matter be resolved in the first instance by the Minister for Urban and Regional Development as it was their wish that this development should form part of the growth centre programme. Following consultation, the Cities Commission advised that Government policy in regard to decentralisation would best be satisfied by locating the Laboratory at Geelong. In conjunction with the Cities Commission and the Geelong Regional Planning Authority, a thorough survey of the area was made and resulted in the selection of the Geelong Rifle Range site which is owned by the Australian Government. It is planned to relocate the Geelong Rifle Range on another site.

THE PROPOSAL

45. General Principle The object of this proposal is to construct a laboratory complex which will provide Australia with its own maximum security laboratory to provide the diagnostic and vaccine testing facilities that would be needed in the event of a major exotic disease penetrating Australia's quarantine barrier. The complex will also have the capacity to produce foot and mouth disease vaccine.

46. The proposed Laboratory has been designed so that the overall facility can be readily divided into areas without any special requirements for maintaining microbiological security and areas where special construction materials and methods and engineering systems are required to maintain microbiological security.

47. A 'box within a box' principle has been adopted in the design so that high hazard activities are located several barriers away from the environment requiring protection. It has been recognised that circumstances may arise in which the barrier closest to the source of hazard may malfunction and allow spread of the infectious agent to other areas where it will be retained by a secondary or, if necessary, a tertiary barrier.

48. The 'box within a box' principle incorporates a system of differential air pressures which ensures the flow of air towards sources of high hazard at all times. It is a planning system which has been developed overseas during the last 50 years and is in operation at laboratories such as the Viral Oncology Laboratories, National Institute of Health, Bethesda, U.S.A. and the Animal Virus Research Institute, Pirbright, United Kingdom.

49. The basic design philosphy has been that the Animal Health Laboratory should be capable of handling the highly infectious foot and mouth disease virus. It was concluded that if this could be done, the Laboratory would be capable of handling any of the known exotic disease agents with safety. It should be noted, however, as previously mentioned, that it is not intended that any form of foot and mouth disease virus will be introduced into Australia prior to an outbreak of this disease in Australia.

50. Management The Animal Health Laboratory will be operated on behalf of the Australian Government by the C.S.I.R.O. Division of Animal Health

and the Officer-in-Charge will be directly responsible to the Chief of that Division and through him to the Executive of C.S.I.R.O.

51. Responsibility for the day to day operation of the Animal Health Laboratory and for the maintenance of microbiological security will rest with the Officer-in-Charge.

52. To assist in the determination of priorities and to ensure effective liaison on policy matters, there will be an Animal Health Laboratory Consultative Committee comprising the Chairman of the C.S.I.R.O. Executive, the Permanent Heads of the Departments of Health, Agriculture and Northern Development, and a representative of the Australian Agricultural Council.

53. The Animal Health Laboratory is being established primarily to provide the States with a facility that will assist them in the control or eradication of exotic diseases in the event of an outbreak. For the Animal Health Laboratory to operate satisfactorily, it is essential that the Laboratory has the confidence and complete co-operation of the various State Departments of Agriculture; without such co-operation the Laboratory could not fulfil its functions.

54. In the event of a suspected outbreak of an exotic disease, fully effective lines of communication would be essential to ensure that the programme of disease control carried out by the States is closely co-ordinated with the programme of laboratory diagnosis and testing carried out by the Animal Health Laboratory.

55. Maintenance and Control of Microbiological Security Once the Laboratory has been constructed and commissioned, it will be essential that it operates continuously at a high level of microbiological security. The maintenance of microbiological security will depend to a large extent on

the maintenance of building structures and engineering systems and the operation of staff in a planned and ordered manner.

56. Those engineering systems essential for the maintenance of microbiological security will be designed to be fail-safe and vital elements will be duplicated.

57. The control of microbiological security within the Animal Health Laboratory will be the immediate responsibility of the Security Officer who will have extensive training in microbiology. He will have Laboratory support in carrying out his activities and will lay down procedures and rules of operation necessary to maintain microbiological security and will ensure that they are strictly enforced.

58. Functions of the Animal Health Laboratory The Animal Health Laboratory will have four main functions:

(1) It will provide a diagnostic service to support the control and eradication of exotic diseases of livestock should they be introduced into Australia and to ensure that livestock imported into the proposed off shore high security quarantine station are free of exotic disease. This is the most important function of the Animal Health Laboratory as it is vital to obtain a rapid and accurate diagnosis of exotic diseases. A wrong diagnosis can cause almost as much damage as a correct one, particularly to Australia's export trade.

(2) The Animal Health Laboratory will undertake a continuing research programme into indigenous and exotic diseases of livestock to ensure that the staff are fully trained and ready to meet any emergency.

(3) Field staff will be trained in the recognition and presumptive diagnosis of virus diseases, in particular exotic diseases of livestock. Laboratory staff will be trained in techniques for the isolation and identification of viruses. The training of field staff in the recognition and presumptive diagnosis of exotic diseases requires maximum security animal accommodation where arrivals can be infected and examined by field staff and a presumptive diagnosis, based on clinical features given.

(4) The Animal Health Laboratory will be capable of producing 200,000 doses of foot and mouth disease vaccine per month. In any outbreak of foot and mouth disease in Australia, the immediate objective will be to eradicate the disease by the quarantine of affected properties and the slaughtering out of affected herds and flocks. Depending on where the outbreak occurs, it may be necessary to vaccinate susceptible livestock surrounding the outbreak to prevent the disease spreading to other areas.

59. Committee's Conclusion The 'box within a box' principle of design of the Laboratory will ensure microbiological security and the proposed functions of the Laboratory are appropriate.

60. Staffing The Laboratory when fully operational is expected to require a total staff of approximately 170 including 25 scientists. This represents a ratio of 1 scientific staff to 5.8 supporting staff. This is more supporting staff per individual scientist than the conventional biological laboratory which is investigating diseases of livestock and which is not operating under maximum security conditions.

61. The additional staff required in a maximum security laboratory is related to the maintenance of microbiological security. A large component

of the total staff is made up of maintenance and security personnel who, respectively, are required to maintain the sophisticated mechanical systems and to ensure the overall security of the facility.

62. Safety Factors The fail-safe design and back-up systems provided for the Laboratory, the use of special facilities for handling infectious agents and the intensive training of Laboratory personnel in the methods of operation within the Laboratory will minimise microbiological accidents. Areas of operation where injuries are most likely to occur have been identified and precautions incorporated in the design to reduce the risks to a minimum.

63. The Committee sought assurance from the C.S.I.R.O. that the operations of the Animal Health Laboratory would not pose a threat to the population of Geelong. The Committee were told that the most stringent safety measures had been incorporated in the design so as to prevent the escape of viruses from the Laboratory. It has been recognised that unless adequate precautions are taken, laboratory personnel could carry infectious agents from within the Laboratory to the outside. It is proposed that personnel will manipulate highly infectious agents in microbiological safety cabinets, which restrict the spread of infectious agents and reduce significantly the chance of contaminating personnel. All personnel will be provided with protective clothing and will be required to shower before leaving the Laboratory.

64. All air exhausted from the maximum security areas of the Laboratory will be passed through two sets of ultra high efficiency filters in series. In addition, whenever highly virulent viruses such as foot and mouth disease virus are being handled, the exhaust air from the high hazard zones will not

only be filtered but will be incinerated as well. Overseas laboratories handling foot and mouth disease virus, such as at Plum Island in the U.S.A., rely entirely upon air filtration in their air treatment systems and this is less efficient than that proposed for the Animal Health Laboratory. The combination of air filtration and air incineration is capable of effectively reducing the amount of virus in exhaust air to a level that ensures a satisfactory margin of safety.

65. All liquid wastes from the maximum security areas of the facility will be collected and then treated by heat for a length of time and at a temperature that will ensure its sterilisation. The system for liquid wastes treatment recommended for the Animal Health Laboratory is based on the system installed at Plum Island and which has been demonstrated to be both reliable and efficient.

66. Animal carcasses will be safely disposed of by utilising a two stage system; a sterilising cycle employing moist heat followed by disposal by incineration. This system has a margin of safety and a degree of containment that will not permit the escape of infectious agents.

67. Committee's Conclusion The precautions taken to prevent the escape of infectious disease viruses have been based on and are an improvement on measures which have been successful in a number of similar laboratories overseas.

68. Livestock Free Buffer Zone . The Chief Verterinary Inspector of the Victorian Department of Agriculture has advised that the Laboratory should be surrounded by a one mile zone in which the keeping of susceptible livestock would not be permitted. He has defined susceptible livestock as sheep, cattle, pigs, goats, horses, fowls, turkeys, geese and ducks. The keeping of cats, dogs and caged birds (other than poultry) by householders will be permitted. The site is, in fact, well situated in relation to remoteness from susceptible livestock, particularly cattle, sheep, pigs and goats. Some horses graze within open areas to the south of the site and at the present time there are backyard poultry scattered throughout the southern and south-eastern sectors of the mile radius.

69. Relocation of Trotting and Dog Racing Tracks A firm undertaking has been given that the trotting and dog racing tracks on nearby Corio Oval will be relocated on a site outside the mile radius. The Victorian Government has agreed to do this by the time the Animal Health Laboratory is completed in 1981. There appear to be very few problems in obtaining freedom from the specified animals in the mile radius surrounding the Laboratory, and at very little inconvenience to the general public.

70. Educational Establishments The Gordon Institute of Technology is readily accessible from the site, and is able to provide suitable courses for the training of technicians.

71. Although at present there is no university in Geelong with established departments of microbiology and biochemistry, a site has been reserved at Geelong for a university, and it appears that in the foreseeable future a university will be built in the area. Melbourne University and the C.S.I.R.O. Division of Animal Health are little more than an hour's drive from the Geelong site.

72. There is no major commercial airport serving Geelong, although Geelong is linked with Tullamarine by a good divided highway. The Committee were

informed that the airport at Avalon (capable of handling 707 or 747 type aircraft) which is approximately 15 kms from Geelong, could be considered as an alternative to Tullamarine in an emergency situation.

73. Environmental Impact During the construction phase and at such time as the Laboratory becomes fully operational, it is expected that the environmental impact on the Rifle Range site, the surrounding area, and on the Geelong region as a whole will be minimal. The establishment of the Laboratory is not expected to present a traffic problem within the vicinity of the site. Due to the exclusion of susceptible livestock from the Laboratory's one mile buffer zone, some inconvenience may be caused to a small number of local residents.

74. The location at the recommended site is appropriate to a maximum security laboratory. The waters of Corio Bay form the northern boundary, an extensive salt marsh and salt field occur to the east, a golf course and parkland occur to the west, while there is residential development on the southern side of the road that forms the southern boundary.

75. The greater part of the site presents a wasteland appearance from which the original vegetation has long been displaced. A small area of salt marsh occurs in the north-eastern corner of the site and has an environment similar to that of the adjacent salt marsh. This Sanctuary area has already been disturbed by ponding associated with the commercial production of salt. It is considered that the erection of the Laboratory will have no undesirable effects on the existing vegetation; indeed, effective landscaping and replacement of the wasteland weeds that occupy most of the area could only improve the aesthetic appearance of the site.

76. The Laboratory meets all local environmental and health requirements.

77. The Committee noted that it is not intended to deny members of the public access to the foreshores of Corio Bay in the immediate vicinity of the Laboratory.

78. Foot and Mouth Disease Virus As mentioned previously, it is not intended that the Animal Health Laboratory would work on the highly virulent foot and mouth disease virus prior to any accidental introduction of the disease into this country. Whilst appreciating the reasons for this decision, the Committee believe it is important to bear in mind that the Animal Health Laboratory has been designed to be microbiologically secure specifically against the foot and mouth disease virus. It is the virus against which any evaluation of microbiological security should be made on the premise that if foot and mouth disease virus can be handled with safety then the Animal Health Laboratory would be capable of handling any of the known exotic disease agents.

79. It is apparent that the Animal Health Laboratory would be more effective in the event of a foot and mouth disease outbreak in Australia if the staff were actively skilled in the use and manipulation of foot and mouth disease virus prior to any such outbreak. It would also enable the Laboratory to give more effective assistance to neighbouring countries in combating foot and mouth disease.

80. Committee's Conclusion After a suitable proving period, the Laboratory should be authorised to handle foot and mouth disease virus prior to an outbreak of the disease in this country.

81. Co-operation with the New Zealand Government The Committee noted that as the New Zealand Government has somewhat similar problems to Australia in respect of animal health and quarantine matters, it could have been kept informed of the developments that have occurred to date. The Committee were advised that the Australian Government had not considered it appropriate at this stage for the New Zealand Government to be informed but this no doubt would be considered in the future. An early approach to New Zealand would enhance active co-operation between the two countries in the operation of the facility.

82. Liaison with Countries Adjacent to Australia Apart from its role in the national plans for the control of exotic disease, the Committee were informed that the Government foresees that this Laboratory could well participate in assisting in the control of animal diseases of countries adjacent to Australia thus helping to keep back the frontier of exotic diseases, particularly foot and mouth disease. We note with satisfaction that the Australian Government is already assisting the Indonesian authorities to combat foot and mouth disease in their country.

CONSTRUCTION

83. Site The site is located approximately 1.6 km east of the Geelong city centre at the intersection of Limeburners Road and Ryrie Street. It has an area of approximately 36 hectares and is presently used as a rifle range for the Army Office of the Department of Defence. Because of its low lying nature, a largeamount of filling will have to be carried out to enable operational floors to be at the one level.

84. Although only approximately 16 hectares of this site will be required, the control of the entire site is desirable to permit the efficient handling of stormwater on the site and to ensure effective control and planning of services entering and leaving the facility.

85. The site has adequate load bearing qualities over an area of 16 hectares. Basaltic rock at an acceptable depth underlies these 16 hectares and extends from east to west across the site.

86. The site is accessible to water, power, sewerage and gas. The sewage is eventually discharged into the open ocean between Bream Lea and Barwon Heads.

87. Committee's Conclusion The site selected is suitable.

88. Planning and Design The facility has been designed to enable work with highly virulent exotic viruses to be carried out without risk to the large population of susceptible animals and also to prevent cross infection within the laboratories. Therefore, in addition to the normal planning for successful operation and low maintenance, a building complex with a high degree of microbiological security is proposed. The design solution adopted is referred to in general terms as being based on a 'box within a box' concept. This solution arose from a consideration that the design must provide for circumstances in which a barrier closest to a source of hazard may malfunction, but the spread of infectious agents to other areas is prevented.

89. The barriers are physical, mechanical or managerial where there is exercise of control over the movements of personnel and goods. The 'box within a box' concept provides back-up both in the sense of providing a reserve barrier to one system and in the sense that each system is designed to complement the other. It utilises high quality structural enclosures - walls, floors, ceilings, in series as part of the containment system. This includes provision of a system of differential air pressures which ensures flow of air towards sources of high hazard at all times.

90. The 'box within a box' principle is considered by the Department of Housing and Construction to be the most practical and the safest approach in the planning of the Animal Health Laboratory.

91. The building design is one of total concept providing facilities to cope with a national emergency and individual buildings are not detailed in such a manner as to permit stage by stage construction.

92. Personnel access to the microbiological secure work floor of the complex will be via one point where staff change their clothing. Egress will be through the same point where personnel shower and change back into street clothing. All work floors will be on the same level with service floors over and under. Administration, library, computer centre and lecture theatre will form a building outside the microbiological barrier. Other buildings to be outside the main barrier are the Specific Pathogen Free Small Animal Breeding Unit (SPF) and the engineering workshops.

93. Reticulation of all engineering services will be via an underground service tunnel leading to a non-hazardous plant room prior to entry into the restricted zone.

94. Large animal access will be via laminar flow rooms at the western end of the large animal house. All stores will come in via the non-hazardous store area adjacent to the stores high security zone and access will be via a pass box system. Egress from these areas is via autoclaves.

95. The facility will be capable of division into areas without any special requirements for maintaining microbiological security and areas where special construction material and methods, and engineering systems are required to maintain microbiological security. Wherever there is any hazard at all, strict precautions will be taken to prevent the escape of microbiological agents to the outside environment.

96. Structure The foundations of the main building will be both cast and precast reinforced concrete piers. Reinforced, cast in situ columns, slabs and internal walls will be adopted for the service floors and precast concrete load bearing walls for the working floors. External walls will be of precast concrete, except below ground level where they will be cast in situ.

97. External Materials and Finishes The major elements of the Laboratory will feature a heat shield of precast concrete panels with exposed aggregate. Peripheral buildings will have external facings of brickwork and aluminium framed windows. Roofing will be channelled aluminium sheeting and insulation will be provided underneath the roof to reduce heat loss.

98. Internal Generally, internal walls will be precast concrete or poured insitu. Epoxy finishes will be employed.

99. Mechanical Services All maximum security areas including laboratories, animal rooms, service reticulation floors, animal feed corridors, basements, vaccine production area and small animal breeding accommodation will be air conditioned. Systems serving these areas will be of a special nature; in addition to providing constant temperature and humidity conditions, they will be required to control the movement of airborne infective agents in or out of the various areas. Conventional type air conditioning will be provided to some non-hazardous areas including central medium preparation and general stores in the scientific services and supply building, the administration building and control room, filter test room and instrument workshop in the services building. Areas such as plant rooms, external but adjacent to maximum security areas, the equipment room and maintenance workshop in the services building will be mechanically ventilated and heated.

100. Heating will be obtained by the connection of air handling plants to hot water heating systems. Cooling will be obtained by the connection of air handling plants to a central chilled water system.

101. Other services to be provided include air incinerators and fail-safe air systems. Standby air handling plant will be provided.

102. Central steam, chilled water, compressed air, demineralised water and emergency power plants will be located in the services building.

103. Sterilisers will be provided at the barrier wall for the decontamination of materials leaving the maximum security area.

104. A supervisory control and monitoring system will be provided which will continually scan all engineering systems to give immediate and automatic detection of faults. It will be capable of automatically initiating certain operations or being manually overridden.

105. Electrical Services Two 22 kV feeders, each capable of supplying the total load of the installation, will be supplied from a nearby major zone substation and will traverse separate routes. Five substations will be established for load distribution. Generally, electrical distribution will be via the service tunnel or ducts. Emergency generating plant will be provided to maintain power supply to essential power and lighting circuits.

106. Lighting throughout the building will generally be of fluorescent type and will comply with the client's requirements and Australian Standard CA30. Critical emergency lighting will be supplied from batteries. Approximately 50% of the total lighting will be connected to the standby generating plant supply as essential lighting. In maximum security areas, light fittings and power outlets will be designed to ensure microbiological security and to withstand the various decontamination processes.

107. Other electrical services to be provided include

- door interlock systems;
- master clock system;
- pocket paging and intercom systems;
- PABX system and cabling;
- external lighting including roadway, car park and building floodlighting;

- lightning protection to accord with Australian Standard MCI;
- cabling provisions for telemetry, visual aids, computer diagnostics and library reference transmissions;
- goods/passenger lift.

108. Fire Protection Buildings will be of fire resisting construction and, as appropriate, will be divided into compartments by fire rated walls. Alternative escape routes will be provided from all parts of the building. Escape routes from maximum security areas will generally be into fire isolated corridors or compartments providing access to decontamination stations and thence to outside the building.

109. Maximum security areas will generally be protected with thermal detection systems and non-hazardous areas by thermal or early warning detection systems. Automatic sprinklers will be installed in animal and incinerator plant rooms and workshop areas.

110. Portable fire extinguishers, small bore hose reels and fire hydrants will be provided at strategic positions.

111. The Fire Brigade will respond to each fire call but will not normally be admitted to maximum security areas. Animal Health Laboratory personnel will be trained in fire fighting techniques and will be responsible for such activities in maximum security areas.

112. Water Supply, Sewerage and Drainage Water will be supplied from the Geelong Water Works and Sewerage Trust main and a 2.5 million litres storage reservoir will be constructed on site to ensure continuity of supply.

113. Liquid wastes from non-hazardous areas will be pumped to the Trust's sewerage main. Wastes from maximum security areas will be heat treated to a safe level for discharge to the Trust's sewerage main. Storm water will be discharged into Corio Bay.

114. Roads and Car Parks A road system providing access to the buildings will be constructed. Sealed car parks will be provided at several locations around the building complex.

115. Landscaping Landscaping design will take into consideration surface and sub-surface services and the function of the particular area. Shelter belts will be planted for aesthetic and climatic purposes.

116. Australian native planting will link the complex into the general landscaping of the unused portion of the site and will provide an overall assimilation into the adjoining golf course and parklands.

117. Committee's Conclusion The Committee recommend the construction of the work in this reference.

ESTIMATE OF COST

118. The estimated cost of the proposal when referred to the Committee was $56 million.

119. The Committee were informed that a complete reappraisal of the project had been made and a detailed break up of the cost estimate was supplied to the Committee. More than half the cost is attributed to the large animal house and the laboratory wing where special construction material and methods and engineering systems are required to maintain microbiological security. A summary of the reappraised estimate of cost, as presented to the Committee, is set out below.

	$
Building works	38,610,800
Mechanical services	15,224,400
Electrical services	3,015,000
Specialist engineering services and fire protection installations	10,149,800
	67,000,000

PROGRAMME

120. Documentation will take approximately two years to finalise and construction will cover a period of up to six years thereafter. The Committee consider that the construction and establishment of the Laboratory should proceed as a matter of urgency.

RECOMMENDATIONS AND CONCLUSIONS

121. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

		Paragraph
1.	THERE IS A NEED TO ESTABLISH A MAXIMUM SECURITY ANIMAL HEALTH LABORATORY TO ENSURE THE PROMPT AND RELIABLE DIAGNOSIS OF EXOTIC ANIMAL DISEASES.	36
2.	THE PROPOSAL IS ECONOMICALLY JUSTIFIED.	36
3.	THE 'BOX WITHIN A BOX' PRINCIPLE OF DESIGN OF THE LABORATORY WILL ENSURE MICROBIOLOGICAL SECURITY.	59
4.	THE PROPOSED FUNCTIONS OF THE LABORATORY ARE APPROPRIATE.	59
5.	THE PRECAUTIONS TAKEN TO PREVENT THE ESCAPE OF INFECTIOUS DISEASE VIRUSES HAVE BEEN BASED ON AND ARE AN IMPROVEMENT ON MEASURES WHICH HAVE BEEN SUCCESSFUL IN A NUMBER OF SIMILAR LABORATORIES OVERSEAS.	67
6.	AFTER A SUITABLE PROVING PERIOD THE LABORATORY SHOULD BE AUTHORISED TO HANDLE FOOT AND MOUTH DISEASE VIRUS PRIOR TO AN OUTBREAK OF THE DISEASE IN THIS COUNTRY.	80

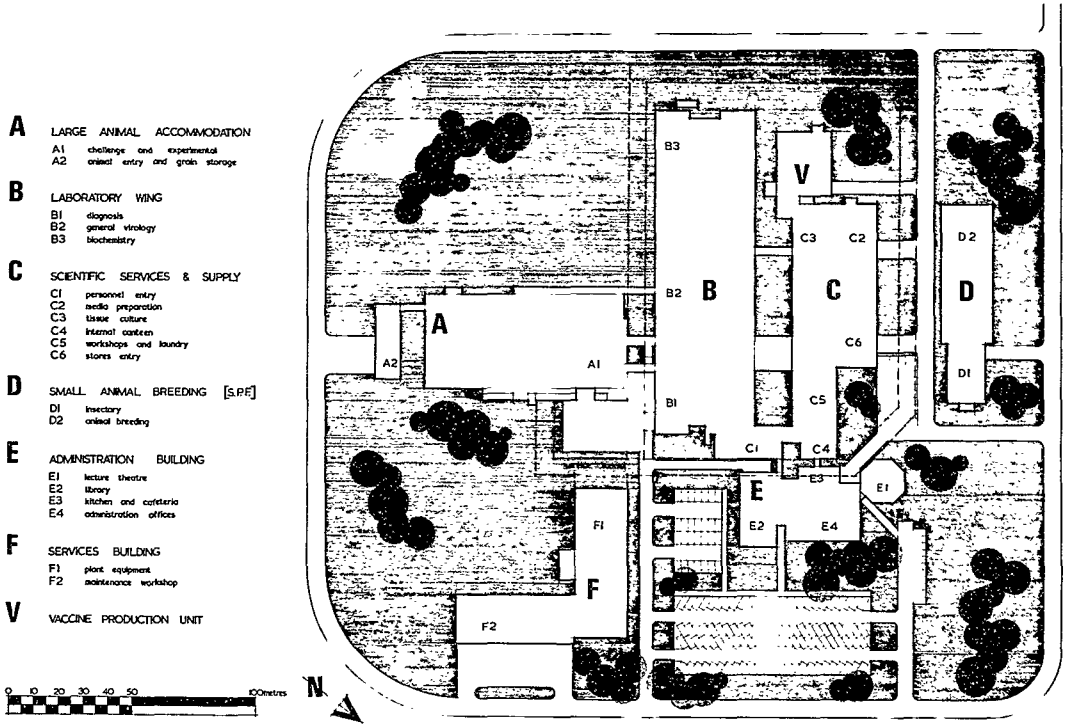
		Paragraph
7.	THE SITE SELECTED IS SUITABLE.	87
8.	THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	117
9.	THE ESTIMATED COST OF THE PROPOSAL WHEN REFERRED TO THE COMMITTEE WAS $56 MILLION.	118
10.	THE REAPPRAISED ESTIMATE OF COST AS PRESENTED TO THE COMMITTEE IS $67 MILLION.	119
11.	THE COMMITTEE CONSIDER THAT THE CONSTRUCTION AND ESTABLISHMENT OF THE LABORATORY SHOULD PROCEED AS A MATTER OF URGENCY.	120

L. K. Johnson

(L.K. JOHNSON)
Chairman.

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

17 October 1974.


A LARGE ANIMAL ACCOMMODATION
A1 challenge and experimental
A2 animal entry and grain storage
B LABORATORY WING
B1 diagnosis
B2 general virology
B3 biochemistry
C SCIENTIFIC SERVICES & SUPPLY
C1 personnel entry
C2 media preparation
C3 tissue culture
C4 internal canteen
C5 workshops and laundry
C6 stores entry
D SMALL ANIMAL BREEDING [S.P.F.]
D1 insectary
D2 animal breeding
E ADMINISTRATION BUILDING
E1 lecture theatre
E2 library
E3 kitchen and cafeteria
E4 administration offices
F SERVICES BUILDING
F1 plant equipment
F2 maintenance workshop
V VACCINE PRODUCTION UNIT
0 10 20 30 40 50 100metres
N
A
A1
A2
B
B1
B2
B3
C
C1
C2
C3
C4
C5
C6
D
D1
D2
E
E1
E2
E3
E4
F
F1
F2
V