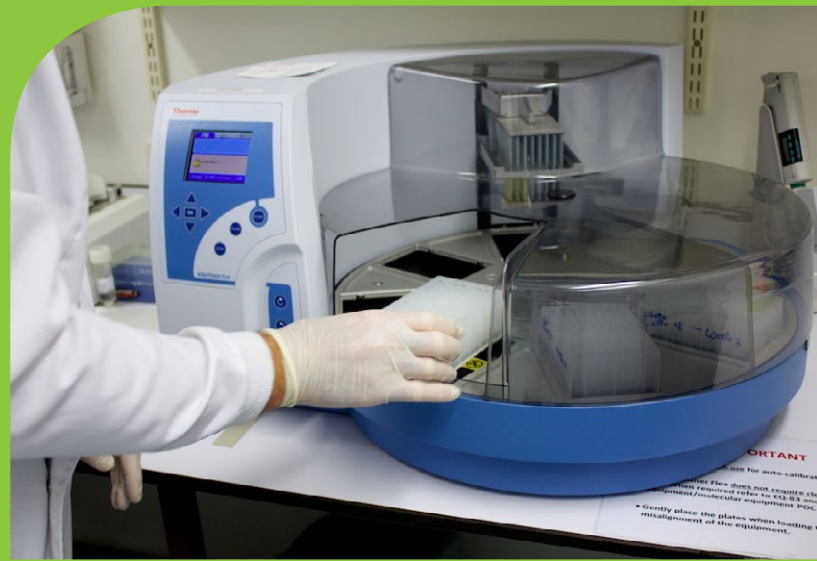




National Biocontainment Laboratory Q & A



NATIONAL BIOCONTAINMENT LABORATORY Q&A

MPI is building a new high-level biocontainment laboratory at the National Centre for Biosecurity and Infectious Disease at Wallaceville, Upper Hutt. The new facility will replace the existing high-containment lab at Wallaceville and continue more than 100 years of animal disease diagnostics at the site.



What work do scientists do in the high-level biocontainment lab at Wallaceville?

They receive samples of suspected serious infectious diseases collected and sent in by vets, doctors and members of the public, and safely undertake a range of tests to make a diagnosis. Samples like this are received most days from all over New Zealand. Usually the scientists' role is to quickly rule out any high-risk infections.

Reference laboratory information provided from Wallaceville is essential for making decisions about disease treatment, managing an outbreak and informing health agencies and international trading partners.

New Zealand's trade depends on the Wallaceville labs' day-to-day surveillance and investigation work to maintain access to international markets.

The high-containment lab's primary role is diagnostic work. In other words, it is not usually used for research. This will continue to be the case with the new lab.

What type of diseases are tested and stored in the high-containment lab?

Known or suspected infectious diseases that would have a serious effect on New Zealand.

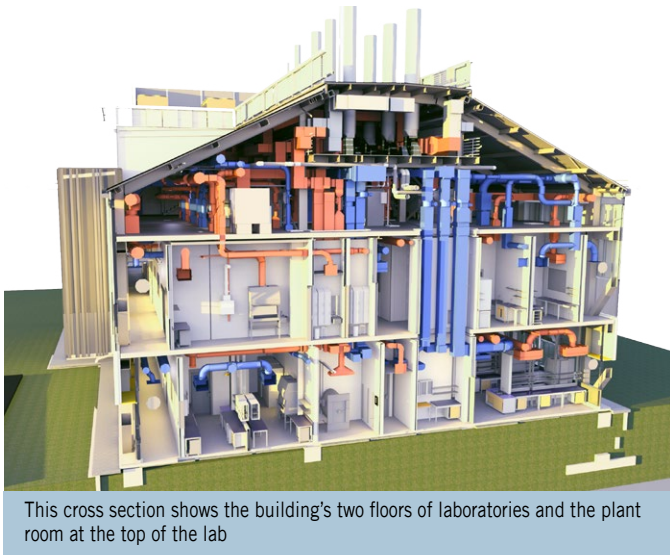
In other words, disease organisms that would affect:

- the health of animals and New Zealanders;
- the viability of New Zealand's animal-based production industries on which our economy relies;
- New Zealand's natural environment.

Small quantities of some serious disease organisms are stored in the laboratory in case scientists need to compare them with a sample. These are called reference samples.

Very high-risk diseases, including rabies and ebola virus, are not held in the lab though scientists may test for them using low-risk molecular tests which do not require live virus.

Live foot and mouth disease is not held in New Zealand. This will continue to be the case with the new lab.



This cross section shows the building's two floors of laboratories and the plant room at the top of the lab

Will the new lab do the same work as the current high-containment lab?

Yes. MPI does not plan to make major changes to the work that is already performed at Wallaceville once the new lab is built. This project is about ensuring the essential work already carried out can be done more efficiently and that modern scientific methods can be used into the future.

Does MPI have any laboratory animals in its Wallaceville labs?

There are no live animals held at Wallaceville for testing or research.

How much will the new lab cost to build?

Total capital investment in the project is \$87 million.

Why is the new lab such an expensive building?

High-level biocontainment labs use complex systems and technology to protect the scientists who work inside and to make sure organisms cannot be released into the environment.

They have sensitive air management systems, fumigation and heating systems to treat refuse and waste water, and sophisticated equipment to safely test and contain serious organisms. Many of these systems are duplicated so that, if there was a failure, the containment systems would still operate at full efficiency. These systems are not needed in other types of buildings, which makes this a highly specialised engineering and construction project.

Who has been involved in designing the new lab?

MPI commissioned the international company, Merrick, to design the facility supported by local companies Dunning Thornton,

CCM and Beca. Merrick, which is based in North America, has designed and built a large number of similar secure containment facilities around the world.

Senior lab staff and an international team of engineering and biosafety experts have also been extensively involved in reviewing the design to ensure it aligns with international best practice. The lab is being built by The Fletcher Construction Company.

Why is the new lab being built at Wallaceville?

A laboratory of this type has been operated at Wallaceville since 1905. The existing site at Wallaceville continues to be the best site for a high-containment laboratory. The specialist scientific staff who are needed to operate the lab are all established in the area. The property is designated for this purpose, which means a new resource consent process is not needed. It is centrally located in New Zealand and has the necessary cluster of support labs and facilities.

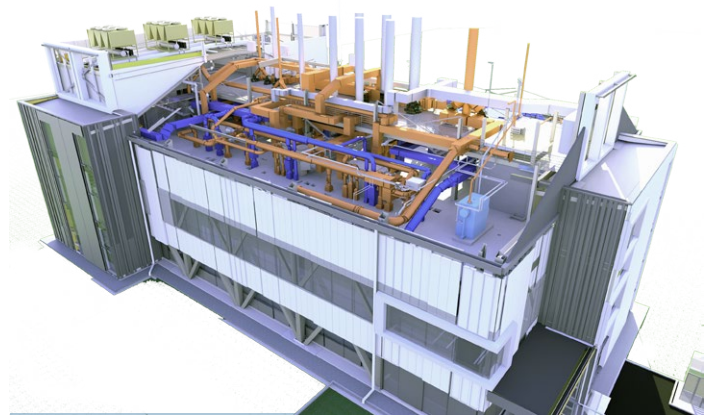
MPI is committed to the Wallaceville site and supporting the local economy and science in the Hutt Valley.

How safe will the new lab be in an earthquake?

The new lab is designed to survive a one in 2500 year quake. A lot of design work has been carried out to ensure the building meets very high earthquake standards. For example, the building will sit on base isolators to reduce damage and protect biocontainment during an earthquake.

When will the new lab be completed?

The new laboratory is expected to be operating by early 2019. Once construction is completed, all the lab's systems will be rigorously tested. It must be approved and certified as a high-containment facility before any high-risk viruses and bacteria are transferred from the existing lab and the new facility enters operation.



The plant room, on the top floor of the new lab, contains complex air management, hydraulic and electrical systems to protect the scientists and make sure organisms are not released into the environment.

What is happening to the existing high-containment lab?

The current high-containment laboratory will continue operating during construction and be decommissioned once the new lab enters operation in 2019.

Why is the existing high-containment lab being replaced?

The current high-containment lab is nearing the end of its intended lifespan. It is becoming outdated and increasingly expensive, complex and time-consuming to maintain.

It has an outdated, inefficient layout and cannot be used for some modern laboratory testing methods. A large biosecurity emergency would create extra operating pressures.

For this reason, MPI is taking proactive steps to maintain safety and provide the level of diagnostic service New Zealand needs for both public health and maintaining trade in primary products.

Are there safety concerns with the existing high-containment lab?

The current lab has an excellent safety record and has consistently met stringent quality assurance and containment audits. Maintaining the lab is becoming more costly and difficult, but MPI has good processes in place to make sure it operates safely.

However, the lab was not designed to cope with the increased workload that would be expected during a major disease outbreak. There are concerns that a major increase in workload for a sustained length of time could risk a mechanical failure and lead to shutting down the lab when it is most needed.

Does testing of serious diseases have to be done in New Zealand? Could it be done overseas?

The high-level biocontainment laboratory is critical infrastructure to protect the health and wellbeing of New Zealand's people, animals and environment. Similar facilities exist in other countries.

If a serious disease is suspected we need to know as soon as possible so the case can be resolved, if negative, or, if positive, the affected animals can be isolated and treated and any potential outbreak managed. Sending samples overseas for testing often slows down our ability to respond and could have devastating consequences for New Zealand.

Samples can be lost, destroyed or delayed for days in transit. Results can be further delayed if the testing is not a priority for the overseas laboratory.

Having these lab facilities is about being prepared for a disaster.

Why aren't testing services contracted out to a commercial lab in New Zealand? It might be cheaper and more efficient.

There are no other labs in New Zealand that have been built to the physical containment (PC) level needed to safely test serious infectious diseases. It is not safe for these tests to be done in a lab with a low PC level.

There are other advantages of having lab services based in MPI. It allows direct oversight of the handling and security of these high-risk organisms. It ensures tests are always available at short notice and procedures are maintained at the highest level of safety.

What are PC levels and what do they mean?

Containment facilities that hold viruses and bacteria are approved according to an international scale called a physical containment, or PC, level. PC1 is the lowest containment level and is used for the safest bacteria and viruses, while PC4 is the highest.

New Zealand has many PC1 and PC2 scientific labs, a handful of PC3 labs and one lab, the high-containment lab at Wallaceville, at an enhanced PC3 level. This is because it contains enhancements above PC3 and is the highest level of biocontainment approved in New Zealand. The new lab being built at Wallaceville will also be at an enhanced PC3 level.

Bacteria and viruses are similarly rated with risk levels from 1 to 4. The level of containment required can vary from country to country depending on many factors, including whether the bacteria and virus is already present in the environment.

High-risk bacteria and viruses require a high-containment lab to be handled safely. The closest PC4 laboratory to New Zealand is in Australia.

For more information

More information about MPI's Investigation and Diagnostic Centre and the National Biocontainment Laboratory Project can be found on our website: www.mpi.govt.nz/new-lab.

If you have any questions about the project please contact info@mpi.govt.nz or phone **0800 00 83 33**.