



**Institute of
Environmental
Science and
Research**

**Statement of
Corporate Intent
2014 – 2019**

Presented to the House of Representatives pursuant
to section 44 of the Public Finance Act 1989

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Executive summary

ESR is a Crown research institute (CRI) providing science-based solutions across four key areas: forensic science, safeguarding the health of New Zealanders, protecting our food-based economy, and improving the safety of freshwater and groundwater. Our work helps build a strong economy and protect the environment, and is essential to the health and well-being of New Zealanders.

ESR has recently been through a comprehensive strategic refresh to ensure we have the resilience to seize opportunities and meet challenges in the next five years. We are facing a significant financial sustainability challenge due in part to the tighter fiscal environment in the government sector, competitive pressures and the necessary increased capital intensity of the business. This sustainability challenge means we have had to review our strategy and consider a business model that will move ESR beyond the area of high-end science to a model where we are more responsive to the needs of our customers and where we will explore growth in the area of human health, with a particular focus on One Health and omics.

Our new strategy will be implemented in three phases:

1. Strengthen the core – investing in the right mix and calibre of people, infrastructure, systems and processes while optimising productivity and improving customer orientation and performance.
2. Drive growth initiatives – reducing capital expenditure and releasing capital through real estate restructuring, and growing through commercialising our intellectual property.
3. Achieve step-change – leveraging ESR's existing strength in human health, further developing One Health initiatives and building a national health intelligence platform that will support ESR taking an active role in building the infrastructure for omics technology applications in human genomics for the benefit of the national health care system.

Collaboration has always been key to our work, but in the coming years we will look for ways to enhance existing partnerships, for example through the National Science Challenges, and identify new ways to team up with other science providers, public agencies and businesses where there is a shared goal. We will also strengthen our commitment to our customers. In fact, our new strategy closely aligns our performance targets with those of our customers, which include the New Zealand Police, Ministry of Health, Ministry for Primary Industries, New Zealand Customs Service and many other New Zealand Government organisations and businesses.

ESR has a well earned reputation for providing public good scientific research and services. That commitment will remain, and through our strategy refresh we will also develop a more commercially focused business model that will allow us to meet the needs of our current customers, build our customer base and be financially sustainable.

ESR's core purpose and goals





Our organisation

ESR (the Institute of Environmental Science and Research) is a Crown research institute (CRI) that uses the power of science to solve complex problems with the potential to affect the lives of all New Zealanders.

Our world-class knowledge, research and laboratory services lead, support and advise on the decisions that safeguard people's health, protect our food-based economy, improve the safety of our freshwater and groundwater resources, and provide the justice sector and other sectors with expert forensic science.

Our purpose

ESR's purpose is to contribute to four core outcomes for the benefit of New Zealand. These outcomes are:

1. safeguarding the health and well-being of New Zealanders
2. increasing effectiveness of forensic science services applied to safety, security and justice investigations
3. protecting our food-based economy
4. improving the safety of freshwater and groundwater.

Our full Statement of Core Purpose is set out in Appendix 1.

Our goal

We aim to deliver robust, independent and world-class knowledge, research and laboratory services that contribute to the economic, environmental and social well-being of people and communities in New Zealand, and around the world.

Meeting the needs of our customers and New Zealand

ESR provides a range of research- and science-based services to both government and commercial customers. Through our services and science delivery, we aim to:

- ▶ support the sectors in which we operate to achieve their goals
- ▶ support innovation-based productivity gains for New Zealand by partnering with industry and government clients
- ▶ ensure that New Zealand avoids and mitigates significant social, economic and fiscal costs and harm
- ▶ operate with complete independence and integrity so our science can be applied to high-profile and contentious areas.

Our work

We have high-performing teams across a number of key areas, made up of staff who are impartial, ethical and responsive to the needs of our customers.

Contribution to the national science system

Our capabilities enable us to be an authoritative adviser on critical national reference science in health, radiation science and forensics. Our strategy, as outlined in this document, builds on the capabilities and resources that are embodied in our people, networks, knowledge, technology and facilities.

For example:

- ▶ ESR has the largest team of forensic, radiation and infectious disease scientists and epidemiologists in New Zealand. They collect, collate and analyse huge amounts of data and apply scientific expertise and context to create insights and added-value intelligence
- ▶ ESR has unique national and international science expertise, especially in diseases and microbiology, surveillance systems and epidemiology, related medical specialties, and forensic science
- ▶ ESR is recognised by its major customers as the ultimate arbiter of critical national reference science in health and forensics
- ▶ ESR is the custodian of unique data sets and modelling and interpretation capabilities to support future intelligence-focused science and risk analysis.

We manage a range of critical national science assets and facilities for New Zealand. These include the:

- ▶ National Centre for Radiation Science (NCRS)
- ▶ National Centre for Biosecurity and Infectious Disease, for example incorporating national and international reference services
- ▶ National Influenza Centre, Polio and SARS Reference Laboratories
- ▶ DNA Profile Databank
- ▶ National Vaccine Services
- ▶ Notifiable Disease Database
- ▶ New Zealand Reference Culture Collection (Medical section).

Our capabilities enable us to be an authoritative adviser in each of our areas of work as represented by our business groups (*see next page*).

FOOD SCIENCE

ESR is the core food safety science provider to the Ministry for Primary Industries. Our expertise, relationships and track record stretch across every food production sector in New Zealand. We employ the largest group of microbiologists in New Zealand and have extensive national and international collaborative networks. Our expertise and access to a suite of International Gold Standard tests can help our customers to find out how, where and when food contamination has happened, and identify the type of contaminant and its source. We can also supply advice that backs up existing processes or that can help to prevent any future issues.

FORENSIC SCIENCE

As well as being applied to the analysis of crime scene trace evidence, human tissue, bodily samples and other evidential material, our comprehensive knowledge of the presence and interpretation of DNA is used across the country and around the world. We are the sole forensic science provider to the New Zealand Police and host the DNA Profile Databank.

HEALTH SCIENCE

ESR provides world-class reference laboratory services for the detection and detailed identification of bacteria and viruses that can cause infectious diseases. Our experts collect, collate and analyse data and intelligence on a wide range of diseases present in New Zealand. We provide New Zealand with the expertise it needs to identify rapidly biological and chemical risk agents originating from biosecurity incursions, major infectious disease outbreaks, accidental contamination events and terrorist threats. We are the preferred supplier of scientific services to the Ministry of Health. We collaborate on research projects with other parties including government agencies, education institutes, national and international health services, and international organisations.

RADIATION SCIENCE

ESR's experts provide advice on and services and research capabilities in public, occupational and medical exposure to radiation, performance assessments of radiation equipment, environmental monitoring, critical responses and the measurement of radiation and radioactivity. We help employers to protect their employees through training courses, and our Personal Dosimetry Service measures and records the ionising radiation doses to which employees are exposed in the workplace to help ensure that World Health Organization (WHO) recommended dose limits are not exceeded.

WATER SCIENCE

ESR aids and supports health authorities, local government and communities by supplying scientific advice and expertise on the management of drinking, recreational and waste water. Our experts also work with other organisations on the sustainable management of the biowaste component in the approximately 3.2 million tonnes of waste sent to landfills in New Zealand each year.

WORKPLACE DRUG TESTING

ESR's workplace drug and alcohol testing detects certain drugs, or their metabolites, in samples such as urine, oral fluid and hair. We test for drugs that impair performance including alcohol, illicit drugs and certain legal drugs. Our experts provide an end-to-end service that includes policy advice, testing regimes, employee assistance and training options.

Leveraging our capabilities in key sectors

ESR partners with multiple public and private stakeholders to deliver applied science and knowledge in a range of sectors.

ESR plays the lead role as the sole provider of forensic services to the New Zealand Police. Other partners with which we work in this sector include the New Zealand Customs Service, the Department of Corrections and the Defence Technology Agency. We are contributing to Ministry of Health planning on the development of the new psychoactive substances regime. Our services contribute to more effective justice and security sector operations, and judicial outcomes. We also assist in developing more efficient processes, for example by contributing to the piloting of the Alcohol and Other Drug Treatment Court.

We generate unique data and intelligence and work with others to identify and manage public health threats from diseases and the environment. We contribute to a reduction in harm from illness, reduced health sector costs and increased human productivity.

We are the preferred supplier of scientific services to the Ministry of Health. In this role we undertake many activities that underpin decision-making and policy development. As part of our services, we undertake the national coordination of major outbreak investigations and have assumed a leadership role in convening and operating a New Zealand clinical microbiology network.

Our work also includes advice on the impacts of the environment on human health, including: radiation; groundwater, freshwater and drinking-water quality; and safe biowaste use.

Collaborating for better outcomes

We operate a project-based business model, which enables us to bring together the best team for a given project. We lead and participate in teams drawn from across ESR and from external collaborator and stakeholder organisations in New Zealand and overseas. For example, ESR has recently joined FoodHQ, the international gateway for collaborative food research hosted by Massey University, to ensure that the best of our science is included in a collaborative NZ Inc approach to generating value for the global food industry.

We work in partnership with our public sector customers to ensure that the science they purchase is meeting their needs and helping them to deliver on the Government's priorities for New Zealand. Recent

activity in this area has included the new partnership agreement between the Ministry of Health and ESR. This agreement will help provide the science behind ensuring that New Zealanders live longer, healthier and more independent lives.

Our scientific expertise is also attractive to private and industry customers. For example, we provide food safety science to hundreds of food industry clients, including the red meat and seafood industries. We also work with global vaccine companies to ensure the continual supply of New Zealand vaccine requirements.

ESR collaborates with all other New Zealand CRIs and universities, in addition to a number of public and private New Zealand science providers. The National Science Challenges present an important avenue for collaboration, and we also work with science providers on specific projects.

Because of the essential science in which we are engaged, it is crucial that we build and maintain good working relationships overseas. Working with internationally recognised researchers and programmes extends our science and innovation capabilities and connects us to new and emerging research. In the case of an epidemic or crisis, our partnerships also ensure instant connectivity with the best science worldwide.

The importance of our international relationships was highlighted during the response to Fonterra contaminated cream earlier this year. Our Enteric Reference Laboratory worked with overseas collaborators to determine if *Escherichia coli* (*E. coli*) strains isolated from the cream were non-pathogenic. Collaborators included the Microbiological Diagnostic Unit Public Health Laboratory in Melbourne and the Statens Serum Institut in Denmark.

Below are a few key international connections:

- ▶ ESR leads international research in blood spatter pattern analysis and forensic mRNA research, with core funding augmented by National Institute of Justice (United States) funding.
- ▶ ESR's environmental health scientists participate in multiple European Union-funded projects, particularly in food safety, where we offer unique expertise now being leveraged into China.
- ▶ ESR is assisting the Ministry of Foreign Affairs and Trade with bilateral relationships with Australia and Asian countries and the Pacific Islands.

- ▶ ESR has memoranda of understanding with several key international research organisations, including the United States Department of Agriculture, United States National Institute of Justice, Chinese Cereals and Oils Association, Singapore Health Sciences Authority and Shanghai Jiao Tong University.
- ▶ ESR, through the NCRS programme, provides international monitoring and support activities on behalf of New Zealand, under the terms of the Comprehensive Nuclear-Test-Ban Treaty.
- ▶ NCRS scientists represent New Zealand on international forums and research programmes, for example the International Atomic Energy Agency and the Comprehensive Nuclear-Test-Ban Treaty Organization.
- ▶ Having won a competitive international bid, ESR is leading a multi-million-dollar (US\$) research project funded by the United States Centers for Disease Control and Prevention on influenza surveillance in New Zealand, working with public health, clinical and academic collaborators to perform 'flu surveillance to assist the United States' public health response.
- ▶ ESR contributes to the work of WHO, the Pacific Public Health Surveillance Network and the South Pacific Commission.
- ▶ ESR scientists are members of and advisers to many international and global organisations (such as PulseNet and WHO's Global Outbreak Alert and Response Network) and collaborate with the United States Centers for Disease Control and Prevention, the WHO Collaborating Centres for Influenza, the European Centre for Disease Prevention and Control, the Health Protection Agency in the United Kingdom, and the Institut Pasteur.

Vision Mātauranga

ESR has developed a good reputation for collaboration with Māori, particularly on health- and water-related research projects. We intend to build on these areas by further incorporating Vision Mātauranga concepts into our research and operational activities in environmental health and forensic science. We are also developing a Māori Innovation Strategy.

Working with Māori to understand how our science can help with the management of natural resources is a key strategic focus for ESR. We have some excellent examples of collaboration with iwi in the area of

biowaste, and plan to draw on this experience to work with Māori on innovative solutions.

ESR researchers associated with the Centre for Integrated Biowaste Research (CIBR) have completed two case studies where we have worked closely with iwi:

- ▶ A report following a four-year investigation of biosolids management options in Kaikōura in partnership with local rūnanga was unanimously accepted by councillors and all recommendations adopted, including the continuation of CIBR researchers' work with Kaikōura District Council and the community to facilitate the next steps.
- ▶ A project involving discussion and engagement with the community at Mokai (near Taupō) on the development of a community waste management strategy. Key initiatives included education initiatives with Tirohanga School pupils through the Ministry for the Environment-funded 'Up-the-Pipe' solutions project.

The Government and the Ministry of Health have made it a key priority to reduce health inequalities that affect Māori. Across New Zealand, people with lower incomes suffer more ill health than others, but Māori whānau at all educational, occupational and income levels have a poorer health status than non-Māori. Health science is a key strategic growth area for ESR and we will be engaging with Māori to understand how our expertise and surveillance activity can help to identify and address the factors that cause these health and well-being inequalities.

In the area of forensic science, we will ensure that scientists attending crime scenes continue to receive tikanga Māori training to enable them to do their jobs while being aware of the cultural sensitivities of whānau.

A final element of our Māori Innovation Strategy will be to develop a framework for engagement with Māori. To do this effectively, we will bring in senior Māori research specialists for advice and strategy development. We are also building our internal capacity to engage with iwi and Māori business through a series of wānanga for key staff and the provision of mentoring for staff engaged in Māori research projects. We believe this positions ESR well to pursue a series of partnership opportunities identified in the 2014/15 year.

Strategy



Strategic context – our operating environment

We have developed a strategy that capitalises on the opportunities presented in the current operating environment. We have also identified current challenges and how they will be addressed, along with risks and how they will be mitigated.

Fiscal constraint

The public and the Government increasingly expect 'value for money', which means that the need to operate in an efficient and effective manner is paramount for the continued success of ESR. Aside from addressing these challenges, our strategy identifies opportunities to develop and provide science-based solutions to manage the increasing pressure on government resources in several sectors, such as health and forensics, while contributing to the results identified through the Government's Better Public Services programme. For example, we provide scientific advice and services that directly assist the Ministry of Health in improving, promoting and protecting the health of all New Zealanders. Our services include automated surveillance to enable the early detection, rapid characterisation and timely, continual monitoring of urgent public health threats.

Competitive environment

In recent years we have seen increased competition in some areas of our core business, such as drug testing. Our strategy includes carefully analysing the profitability of individual programmes while keeping an eye on our scientific capabilities and determining how best to meet the needs of our customers while also continuing to diversify our customer base. We also continue to retain critical, rare expertise, such as coronial toxicology, to meet New Zealand's science needs.

Collaboration is key

It is the Government's expectation that CRIs will work more openly and collaboratively to achieve results. This is already an approach to which ESR subscribes, but our strategy further emphasises the benefits of collaboration. For example, when it comes to commercialisation our strategy is to work with key partners to leverage resources, expertise and funding for the best results.

Contributing to the economy

Like other contributors to the national science and innovation system, ESR is expected to work in a way that maximises the Government's returns on its science and innovation investment. Working more collaboratively is one part of this, but we have also developed a strategy that supports our core science delivery and promotes research that will lead to new products for new and existing markets and customers.

National Science Challenges

The National Science Challenges provide an opportunity to align and focus New Zealand's research on large and complex issues by drawing scientists together from different institutions and across disciplines to achieve a common goal through collaboration. We have a leadership role in the 'Our land and water' National Science Challenge. We are seeking to use our expertise in genomics to support the 'A better start' and 'Healthier lives' National Science Challenges and we are actively involved in all but one of the other National Science Challenges.

Christchurch rebuild

ESR has continued, and will continue, to support the Christchurch rebuild through science and innovation provision, along with our property management planning. For example, we are working with university and local government partners to aid the recovery of water quality and safety in Christchurch. We also continue to be a good employer in the region.

Sharing knowledge and technology

With technological advancements and the expectation from the Government, our customers and the public that we can transfer technology and knowledge efficiently to end-users and stakeholders, we have developed policies and processes that are more aligned with the Government's open access policies, including data-sharing where appropriate.

Strategic direction

Like other CRIs, ESR is in a dynamic landscape that requires us to continue to calibrate our strategic direction to best meet the Government’s needs for a high-functioning national science and innovation system and to support our existing customers, to broaden our customer base.

Refreshing our strategy

ESR has just completed a strategy refresh that will have implications for every aspect of our organisation in the next five years. ESR has a well earned reputation for providing public good scientific research and services. That commitment will remain. However, through our strategy refresh we have also developed a more commercially focused business model.

There are three phases in our strategy:

1. Strengthen the core

Investing in the right mix and calibre of people, infrastructure, systems and processes while optimising productivity and improving customer orientation and performance.

2. Drive growth initiatives

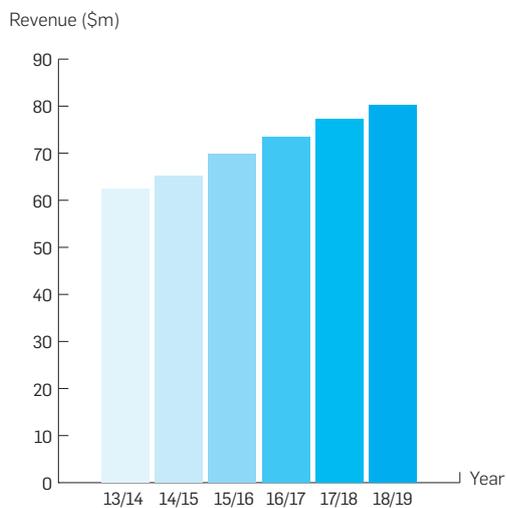
Reducing capital expenditure and releasing capital through real estate restructuring, and growing through commercialising our intellectual property.

3. Achieve step-change

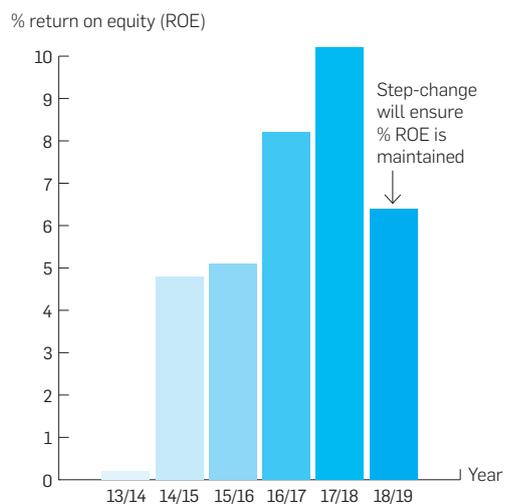
Leveraging ESR’s existing strength in human health, further developing One Health initiatives and building a national health intelligence platform that will support ESR taking an active role in building the infrastructure for omics technology applications in human genomics for the benefit of the national health care system.

Strengthening our financial position

In financial terms, our goal is to reach a return on equity of eight per cent, which will require strong organic growth from our existing services, the launch of new services, commercialisation success and strategic partnerships, along with a continued emphasis on partnerships to achieve greater scale.



Central to the strategy refresh is sustained revenue growth, with a goal of \$80m in revenue achieved by 2018/19.



ESR is required to deliver a return on equity of eight per cent. The strategy aims to deliver this by 2016/17 with the step-change required to sustain this beyond 2018/19.

Elements of our strategy

1. Strengthen the core

We will provide stronger commercial leadership for our current and future programmes and drive business development through an improved alignment of internal resources, new models of delivery and the provision of marketing support. We will also provide a commercial lens to our public good science and seek opportunities to grow. We will grow our core business by \$10m in 2018/19.

We will work closely with current and potential customers to better understand their needs and to tailor our services to fit those needs. This is partly about remaining valued and competitive as a service provider, but is also about ensuring that customers see how our science-based services can help them to achieve and improve their outcomes.

In many of the sectors in which we work (such as the food sector) there are multiple, complementary sources of expertise. This means that the best value for NZ Inc will be delivered to customers through multilateral partnerships with other CRIs, universities, local authorities, health authorities, consulting firms and others. We will build collaborative partnerships where these are needed to deliver better results for customers in different sectors. We will work closely with our partners to apply commercial assessments of projects, raise funds and advance our projects.

The quality of our staff is crucial to our organisational success. ESR employs highly regarded experts in critical niche areas.

We will continue to strengthen internal systems and processes to ensure that we support our staff to excel in their work. As part of this, we have recently implemented a more effective performance management system and are using this to drive performance and operationalise strategic goals for our staff.

We will ensure that we adopt best practice communication tools and resources so they can play a key role in the development of a higher-performing and customer-oriented organisational culture.

Our work in the immediate future is to make a number of key appointments, including the appointment of an omics expert by December 2015 (see the definition on page 13) to provide advice and drive ESR's role in this growing area of the health sector.

We will introduce a stronger project management and coordination discipline to guide decision-making at all levels. An investment office will be established within the corporate structure during 2014/15 to oversee all investments, including capital expenditure, commercialisation activities and the strategic allocation of core funding. At the same time we will focus on streamlining our cost structure.

We will optimise our information technology (IT) investments so we are able to support existing customers, expand our science and innovation provision to new customers, maintain our own business systems, and enhance our ability to transfer knowledge and technology to end-users. We are also investigating opportunities to partner with other providers and leverage those relationships.

We will reinvigorate ESR's brand in 2014/15 and take a more strategic approach to managing our relationships with partners and key stakeholders to ensure that we have a strong reputation for excellence and service.

2. Drive growth initiatives

Our property strategy will be finalised by July 2015 and will assess the current configuration of our sites to ensure that we have excellent facilities that support our world-class science and best meet our customers' needs.

We are taking steps to increase our revenue stream through commercialising the intellectual property developed as a result of ESR pursuing the outcomes in our Statement of Core Purpose.

Our business and commercial managers will introduce and follow a stage-gate commercialisation process that uses a 'fail fast, win fast' approach.

We will supplement our own funds with co-funding at every stage and will not invest in late-stage commercialisation activities without co-funding or equity partners.

A more strategic focus will be applied to the use of core funding, aligning allocations from the strategic pool of funding more closely to the growth of the organisation. We have reviewed our core funding allocation process to meet these needs.

We will also seek to take advantage of partnership opportunities relevant to our strategic direction.

3. Achieve step-change

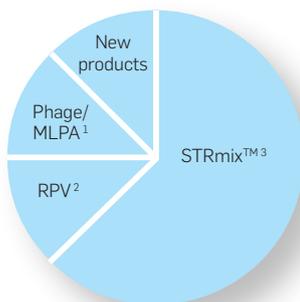
We will build on our strengths in health through the health intelligence platform. This will include building our expertise and services across more diseases, partnering with additional organisations that have complementary knowledge and skills, and ensuring that ESR has greater reach at the regional level. We are aiming to have initiated a national health intelligence platform by 2017.

In addition, we will establish a clear role for ESR in the implementation of omics applications within New Zealand's health system. We recognise that this is a long-term commitment and that the financial benefits may be some years away, but in the immediate future our work will include:

- ▶ contributing to the national debate on the provision of omics-based health care services to New Zealanders; in particular, we will seek to use our expertise in genomics to support both the 'A better start' and 'Healthier lives' National Science Challenges
- ▶ building capability in the area of omics infrastructure
- ▶ attracting expertise in this area
- ▶ engaging with key stakeholders to build partnerships at the senior level.

Omics – a definition

Omics refers to a field of study in biology ending in -omics (such as genomics). Omics characterises and quantifies groups of biological molecules to determine aspects such as the structure, function and dynamics of an organism or organisms. The term omics also describes recent advances in high-throughput technologies that could be used to lower costs and provide faster analysis of relevant omics data, as well as enable greater possibilities in delivering science-based benefits.

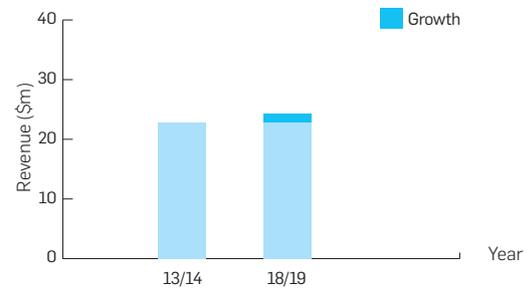


Commercialisation revenue \$8m by 2018/19

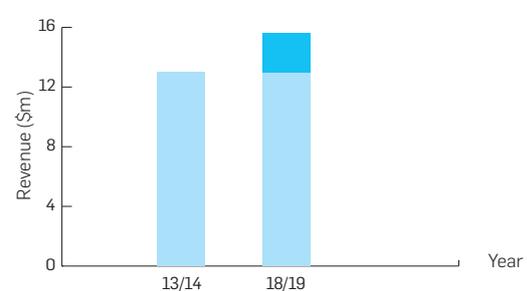
¹ Phage/MLPA: Phages for biological control of food pathogens. Multiplex Ligation-dependant Probe Amplification (MLPA)
² RPV: Rapid Point Viewer
³ STRmix™: expert forensic software that can resolve previously unresolvable mixed DNA profiles.

Core business growth

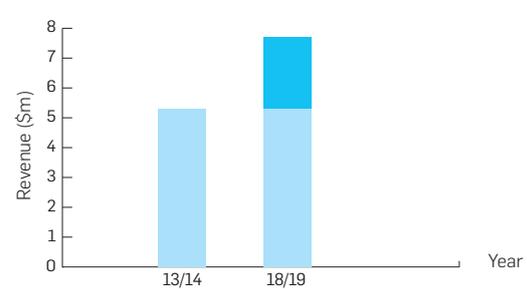
Forensic



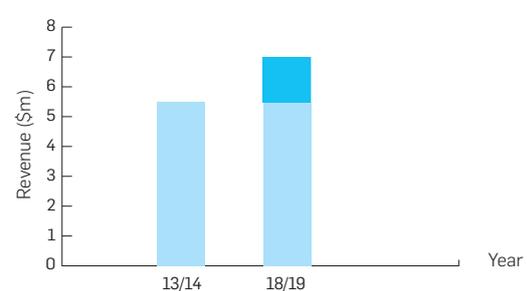
Health



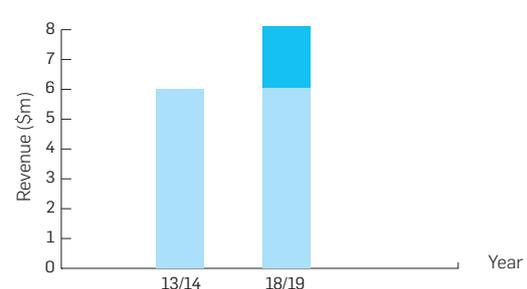
Food



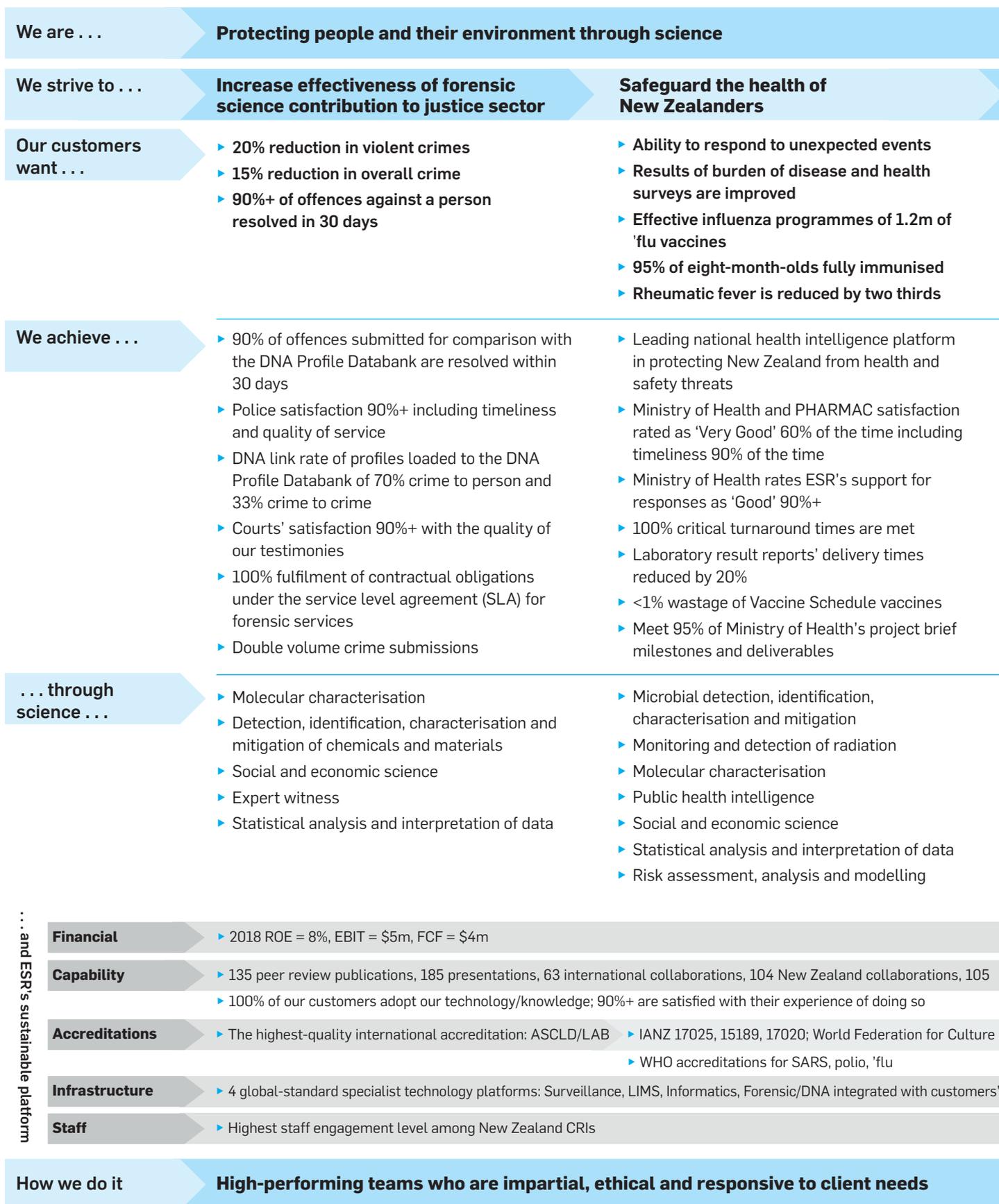
NCRS



Water



ESR outcomes and goals



Protect our food-based economy

- ▶ Double value of primary sector products by 2025
- ▶ Enable reduction of biological risk
- ▶ Enhance integrity and reputation of New Zealand primary products

- ▶ Provide scientific support for mitigation and management of food safety and reputational risks
- ▶ Develop new tools and quantifiable metrics to differentiate New Zealand niche products
- ▶ Grow Ministry for Primary Industries business by 50%
- ▶ Grow revenue from food companies/industry associations by \$1m
- ▶ New IANZ accredited tests
- ▶ Grow research revenue
- ▶ Commercialise \$1m+ of annual revenue in food safety
- ▶ Customer feedback: 90% positive

- ▶ Microbial detection, identification, characterisation and mitigation
- ▶ Monitoring/detection of radiation
- ▶ Molecular characterisation
- ▶ Detection, identification, characterisation and mitigation of chemicals and materials
- ▶ Social and economic science
- ▶ Statistical analysis and interpretation of data
- ▶ Risk assessment, analysis and modelling

Improve the safety of freshwater and groundwater

- ▶ Drinking-water compliant with standards
- ▶ Improvement in the quality of our freshwater and groundwater
- ▶ Increase the composting, use and treatment of organic waste currently disposed of to landfill

- ▶ Provision of annual drinking-water report on compliance
- ▶ Prompt response to more than 400 public health service queries each year
- ▶ Key supplier of water, sanitation and health advice to New Zealand and the Pacific Islands
- ▶ New Zealand and international recognition of ESR Centres of Excellence (Surface & Ground Water; Water & Waste; Risk Assessment)
- ▶ Engagement with Māori to achieve Vision Mātauranga goals
- ▶ Active involvement in National Science Challenges

- ▶ Microbial detection, identification, characterisation and mitigation
- ▶ Monitoring and detection of radiation
- ▶ Molecular characterisation
- ▶ Social and economic science
- ▶ Statistical analysis and interpretation of data
- ▶ Risk assessment, analysis and modelling

meetings and conferences (\$10m external funding)

Collections

▶ IANZ accredited (17025), PulseNet certified

systems



Outcome 1:

Safeguard the health and well-being of New Zealanders through improvements in the management of human biosecurity and threats to public health

What we seek to achieve

Our work under this outcome area contributes to a reduction in the harm and costs from disease and other environmental risks by providing services that support the Government and the health sector to minimise the impacts of microbiological, non-ionising radiation (medical and environmental) and other environmental hazards on public health.

Our work contributes to the early detection of risks and outbreaks directly through health intelligence, surveillance, analysis and reference laboratory services. With early detection, hazards and diseases can be mitigated and sometimes prevented altogether.

Our work helps public health organisations to manage and improve responses to public health problems effectively. This includes providing research for policy and operational improvement, as well as the effective management of the national vaccine supply. This is an expected area of growth for us. We will seek opportunities to provide a wider range of services to a wider range of customers.

How we will achieve this

ESR's work will continue to support rapid and effective responses to public health risks and problems. We offer national and international microbiological reference service testing, including the Virological Reference Laboratory, which incorporates the National Influenza Centre and SARS and Polio Laboratories as recognised by WHO; the National Enteric Reference Laboratory; and other national reference services in nosocomial infection, invasive pathogens, *Legionella*, blood-borne viruses, norovirus, *Leptospira* and anti-microbial resistance.

Our work in this area also includes:

- ▶ the operation of EpiSurv, the New Zealand notifiable disease surveillance system
- ▶ the coordination of national outbreak investigations on behalf of the Ministry of Health
- ▶ the maintenance and development of the New Zealand Reference Culture Collection
- ▶ the forecasting of vaccine requirements
- ▶ through the NCRS programme, the testing of environmental radioactivity samples and the global monitoring of atmospheric radioactivity data collected from stations around the world as part of New Zealand's contribution to the Comprehensive Nuclear-Test-Ban Treaty
- ▶ field measurements of non-ionising radiation, on-site inspections, calibration, training and the Personal Dosimetry Service.

ESR operates and provides services to central government under negotiated and agreed contracts with the key government health and biosecurity agencies. These contracts enable us to deliver core health science services at local and community levels to district health boards (DHBs), public health services and local government.

Our partnerships are currently centred on the DHB-based public health units, university collaborators, research partners in primary care, the Health Research Council and the United States Centers for Disease Control and Prevention. In the future, we will look to strengthen and broaden our partnerships with DHBs, the primary care sector and provider partners. We will also look to extend our international partnerships, including with the European Union.

Our key initiatives

Key initiatives during the strategy include:

- ▶ enhancements to the STARLIMS Health laboratory information management system, including mobility, adding new tests, analytics and developing further or improved reporting by June 2015
- ▶ increasing national vaccine storage and distribution
- ▶ developing a commercial website for the New Zealand Reference Culture Collection
- ▶ the full integration of the notifiable disease surveillance system with health sector clinical information systems.

Defining success:

How will we measure our performance?

Safeguarding the health and well-being of New Zealanders

Our customers' priorities

- ▶ Ability to respond to unexpected events
- ▶ Results of burden of disease and health surveys are improved
- ▶ Effective influenza programmes of 1.2m 'flu vaccines administered
- ▶ 95% of eight-month-olds are fully immunised
- ▶ Rheumatic fever is reduced by two-thirds by 2017 as one of the Better Public Services results

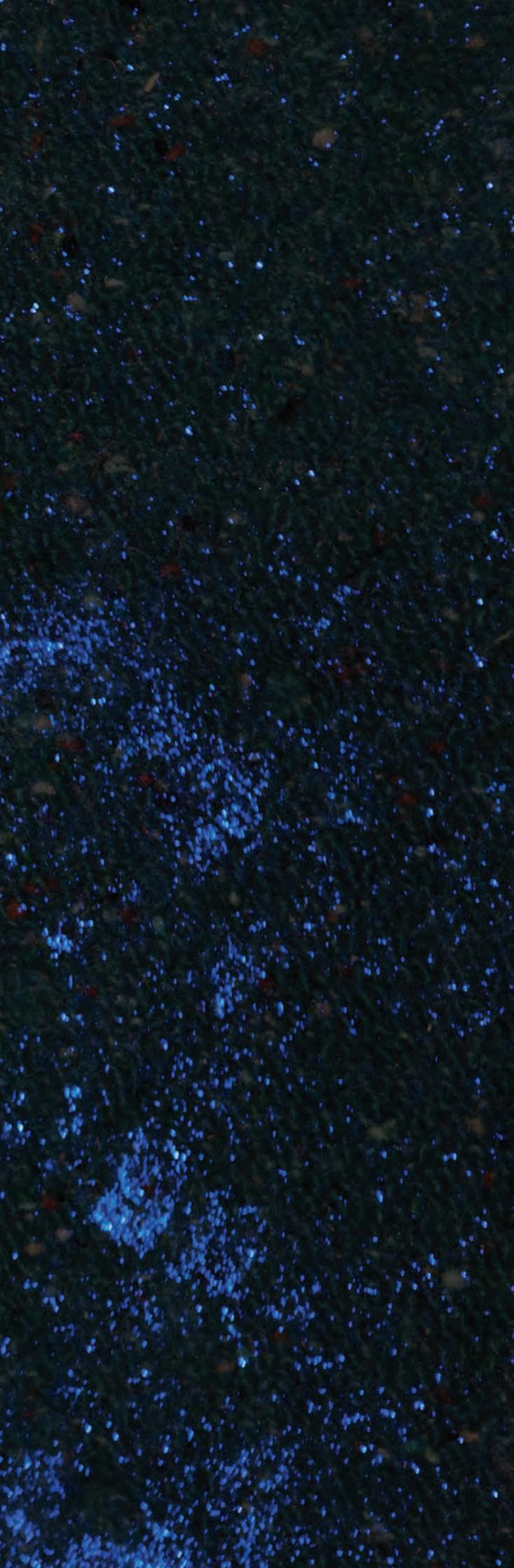
Our key goals

- ▶ Leading national health intelligence platform in protecting New Zealand from health and safety threats
- ▶ Ministry of Health and PHARMAC satisfaction rated as 'Very Good' 60% of the time including timeliness measured as 90%
- ▶ Ministry of Health rates ESR's support for responses as 'Good' 90%+ of the time
- ▶ 100% of time critical turnaround times are met
- ▶ Laboratory result reports' delivery times reduced by 20%
- ▶ <1% wastage of Vaccine Schedule vaccines
- ▶ Meet 95% of Ministry of Health's project brief milestones and deliverables



Outcome 2:

Increase effectiveness of forensic science services applied to safety, security and justice investigations and processes



What we seek to achieve

ESR supports justice sector goals relating to reducing crime, holding offenders to account, delivering a trusted and internationally respected justice system, protecting New Zealand's security and reducing the cost to the justice system.

We work within the constrained spending environment of government agencies while at the same time responding to their increasing demands for new and improved services. Our work contributes to the drive for Better Public Services and the sustainable management of the criminal justice 'pipeline'.

New Zealand is one of the few countries in the world that does not have a backlog of forensic work. Through the development of mutually agreed end-to-end processes with justice sector partners, we have dramatically improved the timeliness of delivery of forensic services to investigators and to the courts.

The immediate impacts of our work are faster, more effective examinations of crime scenes; better forensic evidence delivered more quickly; definitive identifications of individuals; and a more efficient and effective delivery of evidence at trial.

These immediate impacts will in turn lead to the achievement of justice sector goals through:

- ▶ more effective and efficient investigations, including the earlier apprehension and charging of alleged offenders and the elimination of suspects
- ▶ better prosecution decisions
- ▶ better judicial outcomes
- ▶ lower-cost, more efficient criminal justice processes.

We expect to contribute to sector growth impacts through an increase in export earnings by working with the justice sector and New Zealand security and safety sector companies, as well as engaging directly with agencies in other jurisdictions.

In the longer term we will focus on early intervention solutions to reduce serious crimes. This will lower overall justice system costs by reducing the inflow into the criminal justice pipeline.

How we will achieve this

ESR provides forensic services to the New Zealand Police, courts, coroners, pathologists, prisons and the judiciary.

We will continue to develop and adapt new and existing technologies to meet the casework requirements of criminal investigations and the wider needs of the justice system. As part of this, one of our immediate priorities is a major IT investment in STARLIMS Forensic that will be delivered in 2015. This investment will enhance our forensic science capabilities and ensure that our customers' changing

needs are met, including providing capabilities for interfacing with external systems.

Other activities include:

- ▶ delivering forensic services 'from the crime scene to the courtroom', compliant with the international quality accreditation requirements of the Laboratory Accreditation Board of the American Society of Crime Laboratory Directors (ASCLD/LAB)
- ▶ assessing and implementing technologies that meet new challenges in criminal investigations and support joined-up criminal justice processes
- ▶ engaging with the Ministry of Health and interested parties in supporting the development of the new psychoactive substances regime
- ▶ providing social systems science to support crime reduction
- ▶ working with the wider sector to determine what additional services and products can assist public safety and justice sector activities, including drug- and alcohol-free workplaces and counter-terrorism preparedness.

Our key initiatives

ESR has developed advanced crime scene recording and expert evidence presentation tools using core funding. The output generated by applying these tools has been piloted in New Zealand courts and we are now developing a business plan for their wider implementation, including potential commercialisation opportunities. The tools apply scene-scanning technology to record locations of evidence in a way that allows people (such as jurors) to visit a virtual crime scene and clearly see the relationships between items of evidence, and make complex forensic evidence easier to understand. These technologies are expected to lead to faster crime scene investigations, a simplified capture of accurate data, better presentation of key issues to jurors, and a more efficient delivery of evidence at trial, saving time and cost.

ESR has recognised specialist expertise in DNA interpretation, particularly the interpretation of mixed DNA. This brings benefits to New Zealand through our ability to offer improved services to the New Zealand justice system and through our earning a reputation as a world leader in this field. ESR is partnering with agencies in Australia, Singapore, the United Arab Emirates and the United States to provide specialist services. We will be pursuing these and other

revenue opportunities by offering top-end training and consultancy internationally, which also helps to defray the costs of developing new technologies.

We will identify products and services that bring forensic and social science together to support early interventions into offending behaviour. Work in this area is expected to save money and harm by reducing more serious crime and recidivism.

We will identify and engage with potential new clients and partners, within New Zealand and overseas, to deliver science-based solutions that meet their needs. We will focus on businesses involved in commercialisation and innovation for competitive advantage in international markets, including security system, technology and software companies, and informatics, data mining and modelling companies.

Defining success:

How will we measure our performance?

Increasing the effectiveness of our forensic science contribution to the justice sector

Our customers' priorities

- ▶ 20% reduction in violent crimes
- ▶ 15% reduction in overall crime
- ▶ 90%+ of offences against a person resolved in 30 days

Our key goals

- ▶ 90% of offences submitted for comparison with the DNA Profile Databank are resolved within 30 days
- ▶ Police satisfaction 90%+ including timeliness and quality of service
- ▶ DNA link rate of profiles loaded to the DNA Profile Databank of 70% crime to person and 33% crime to crime
- ▶ Delivery of expert testimony to the courts measured by rating of 'Very Good' 90% of the time
- ▶ Volume crime submissions doubled
- ▶ Seamless provision of high-quality forensic service to the New Zealand Police from the crime scene to the courtroom measured by 100% fulfilment of contractual obligations under the SLA for forensic services



<http://STRMIX.esr.cri.nz>



Outcome 3:

Enhance protection of New Zealand's food-based economy through the management of food safety risks associated with traded goods





What we seek to achieve

We have a two-pronged approach under Outcome 3. One is to contribute to the effective management of food safety risks associated with traded goods and provide solutions that ensure the integrity and transparency of New Zealand's food supply chain. The second prong is to diagnose, track and respond rapidly to episodes and outbreaks caused by the consumption of contaminated food.

How we will achieve this

ESR provides advisory, monitoring and diagnostic services and research to help the Ministry for Primary Industries and the food industry to develop and implement interventions to avoid, mitigate and respond to food-borne hazards.

Our work includes:

- ▶ risk-based approaches to the identification, assessment and modelling of microbial, radiation and chemical hazards in the food chain
- ▶ the use of internationally agreed methods for the detection of food-borne pathogens and chemical hazards (including radiation levels) present in foods and from patient samples, and the development and application of new and rapid methods
- ▶ the characterisation of pathogens isolated using specialist and innovative sub-typing methods necessary for outbreak investigations and epidemiological studies
- ▶ research to provide new interventions aimed at reducing and eliminating pathogenic *E. coli* in export and domestic meat
- ▶ providing information for clients on levels of essential nutrients, trace elements and contaminants in the food supply, including the New Zealand Total Diet Surveys undertaken during the past 20 years.

We will continue to work with other providers in New Zealand's science sector to deliver solutions, including the Ministry for Primary Industries, Massey University through FoodHQ, AgResearch, AsureQuality, Plant & Food Research and the Cawthron Institute. Through these collaborations ESR will seek to provide food safety science and research services as part of New Zealand's Food Safety Science and Research Centre.

We have also developed international relationships with leading organisations, including the United States Department of Agriculture and the Chinese Cereals and Oils Association.

Our key initiatives

We will develop biocontrol products and diagnostic tools that can reduce the risk of bacterial contamination during food processing. A continued area of focus will be the six pathogenic strains for which the United States has declared zero

tolerance for through its export beef microbiological requirements. The ramifications for our beef exports could be profound, with New Zealand needing to demonstrate, 'from farm to dock', that these pathogens are not present in consignments.

We will further develop novel mitigation strategies for organisms of relevance to the export and domestic food sectors. This includes the continued advancement of our research on naturally occurring novel antimicrobials against food-borne pathogens including *Campylobacter*, a major cause of gastroenteritis in New Zealand.

We will continue to develop new and rapid detection and sub-typing assays for food-borne micro-organisms based on the patented multiplex ligation-dependent probe amplification approach, together with our international partner MRC-Holland.

We will work to support better authentication of the source and quality of New Zealand products. An example is our work on the authentication of meat species in response to the European Union horsemeat scandal, to ensure that meat being sold is what it claims to be. The 'Prove It!' campaign will be developed to raise the profile of the work we do for the industry.

We will identify and engage with new and existing customers to develop an understanding of their needs and how we are positioned to help them through science-based innovation. New customers may include local and international supermarket chains, food chain technology vendors, international food companies and international government agencies.

Defining success:

How will we measure our performance?

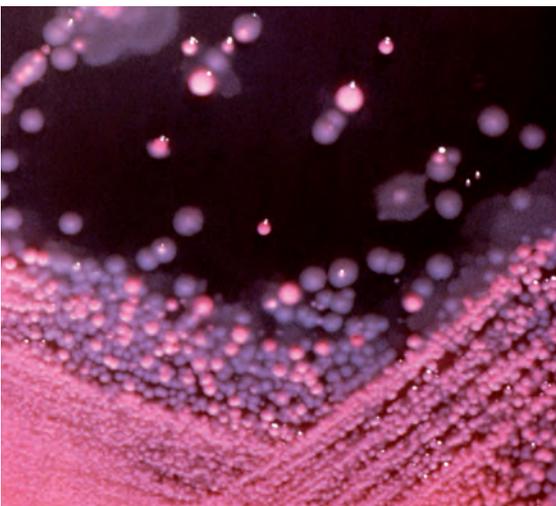
Enhancing the protection of our food-based economy

Our customers' priorities

- ▶ Double value of primary sector products by 2025
- ▶ Reduction of biological risk
- ▶ Enhance integrity and reputation of New Zealand's primary products

Our key goals

- ▶ Provide scientific support for mitigation and management of food safety and reputational risks (including to New Zealand Food Safety Science and Research Centre)
- ▶ Develop new tools and quantifiable metrics to differentiate New Zealand niche products
- ▶ Grow Ministry for Primary Industries business by 50%
- ▶ Grow revenue from food companies/industry associations by \$1m
- ▶ New IANZ accredited tests
- ▶ Grow research revenue
- ▶ Commercialise \$1m+ of annual revenues in food safety products
- ▶ Customer feedback: 90% positive



Outcome 4:

Improve the safety of freshwater and groundwater resources for human use and the safer use of biowastes





What we seek to achieve

ESR aims to contribute to the safety of freshwater and groundwater resources through our understanding of water contaminant transport and attenuation processes.

In addition, our research on the impacts of the environment on human health can contribute to improving policy.

The intended impacts of our work are:

- ▶ faster detection of and response to hazards
- ▶ improved water management practice from the perspective of the human use of water and public health impacts
- ▶ improved understanding of contaminant pathways in water systems, and the impacts of biowaste practices on waterways
- ▶ support for effective regulation, standards and monitoring.

How we will achieve this

ESR will use its knowledge of contaminants and their pathways in the areas of groundwater, wastewater, biowaste and surface water to provide surveillance and research services, including:

- ▶ the development and use of new, internationally recognised methods for the detection of human pathogens and chemical hazards present in water, sediment, soil, biowastes and wastewater
- ▶ the use of internationally recognised approaches for public health risk assessments of microbial and chemical hazards in the water environment
- ▶ research to characterise contaminant pathways from land into and through groundwater and surface water systems, and the connections between these systems
- ▶ research to manage the safe and sustainable use of biowastes, such as sewage sludge (biosolids) and greywater resources – the collaborative ESR-led CIBR guides much of this research work
- ▶ expertise and information to support the implementation of national drinking-water programmes.

ESR has a unique role to play in this area as it connects research and information on the human use of water across the fields of environment and health, which have historically been funded and managed separately. ESR assists multiple agencies mandated under different legislation (the Resource Management Act 1991 and the Health Act 1956) to fulfil our functions.

ESR leads several groundwater research projects in collaboration with other CRIs, independent research organisations and universities, and is an active participant in work to fully integrate freshwater research in New Zealand in partnerships with iwi

and Māori. We also play a leadership role in the 'Our land and water' National Science Challenge based on our unique expertise.

Our key initiatives

We continue to work with the University of Canterbury, Environment Canterbury, Christchurch City Council and other partners to aid the recovery of water quality and safety in Christchurch. We were instrumental during and post the Canterbury earthquakes in providing robust scientific advice on matters relating to water quality and safety, including the effects of liquefaction and sewage system impairment.

We are working to develop ways to assess more accurately surface water recharge into groundwater systems. This work will support more informed allocation decisions.

We continue to work with Lincoln Agritech and Aqualinc Research and with regional councils to assess measures of groundwater assimilative capacity for the key water contaminants of nitrates and microbial pathogens. These measures can then be used in water management by regional councils and district councils to evaluate options for the disposal of water and waste. We will increasingly partner with engineering firms to provide solutions to and options for issues that local authorities face in this area, which requires a wide range of interdisciplinary skills continuing to explore the safe and sustainable application of biowastes to land.

Defining success:

How will we measure our performance?

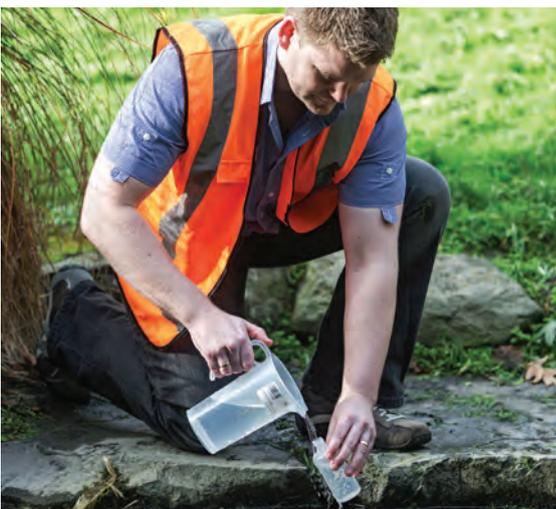
Improving the safety of freshwater and groundwater

Our customers' priorities

- ▶ Drinking-water compliant with standards
- ▶ No further decline in the quality of our freshwater and groundwater
- ▶ Increase the composting, use and treatment of organic waste currently disposed of to landfill

Our key goals

- ▶ Provision of annual drinking-water report on compliance
- ▶ Prompt response to more than 400 Public Health Service queries each year
- ▶ Key supplier of water, sanitation and health advice to New Zealand and the Pacific Islands
- ▶ New Zealand and international recognition of ESR Centres of Excellence (Surface & Ground Water, Water & Waste, Risk Assessment), and our health and society niches
- ▶ Engagement with Māori to achieve Vision Mātauranga goals
- ▶ Active involvement in National Science Challenges



Capability and resources





Our people

People are at the core of our organisation – dedicated, impartial, ethical and responsive to customers' needs. We strive to have a performance-oriented and customer-centric culture with high staff engagement, which we will cultivate through best-practice human resources initiatives such as workforce planning and recruitment, remuneration strategy and structure, and staff development and performance management.

We will use the good employer criteria of the Human Rights Commission to measure the following key aspects of our organisational health:

- ▶ Our culture is adaptive, client focused and performance oriented.
- ▶ We attract and retain staff using fair and effective processes.
- ▶ We invest in staff development and promotion.
- ▶ Our voluntary turnover is kept at moderate levels.
- ▶ Staff can balance their work and life commitments.
- ▶ We offer a positive, safe and healthy working environment.

Our performance as a 'good employer' is reported on ESR's website.

Our infrastructure

IT and other technologies

ESR is committed to maintaining and investing in its IT systems to ensure that we are able to conduct business and meet the emerging needs of our customers. Our technology roadmap identifies the main initiatives that will deliver ESR a dynamic and robust technology platform.

A recent internal survey identified specialised technology platforms that are our priority investments in the next five years. These include:

- ▶ forensic services technology
- ▶ informatics platform
- ▶ surveillance systems
- ▶ laboratory information management systems (LIMS)
- ▶ core business systems.

In addition, we are committed to:

- ▶ better training of staff on new technologies through targeted training sessions
- ▶ delivering and maintaining secure systems and processes
- ▶ empowering staff and customers through the use of next-generation technology, such as mobility, social, cloud and big data

- ▶ adopting all-of-government contracts to standardise services, reduce risk, improve security and reduce costs
- ▶ supporting Government open data initiatives where possible.

Property and facility management

ESR maintains facilities at four sites to support our customers. The facilities are located in Auckland, Wellington and Christchurch.

Our strategy includes moving from our current property ownership model to a more flexible lease-based model, which will release capital for more productive investment in the next five years. This model will allow us to be more strategic in our planning and help to ensure that we get the best value for money.

We will also identify and work with suitable partners to share facilities so that we can maximise the productivity of facilities, create work synergies and share support functions.

Our overarching goals are to:

- ▶ maximise site use
- ▶ ensure that facilities support the specialised scientific capabilities required for excellent customer services
- ▶ apply whole-of-life asset management practices to ensure that the assets remain robust and reliable to support our core business functions and long-term strategic science goals.

Intellectual property

ESR has policies and procedures in place relating to the access, use, maintenance, enhancement, exploitation and transfer of intellectual property and know-how.

These ensure the effective management of intellectual property and maximise the application of the results of research and technological developments, including transfers to end-users and other third parties for the benefit of New Zealand.

The general principles and procedures relating to the intellectual property, research and benefits of research held by ESR (other than national databases and reference collections) meet the requirements of the Transfer Agreement between ESR and the Crown.

National reference collections

On behalf of the Ministry of Health, ESR manages the New Zealand Reference Culture Collection (Medical section). We also assist other CRIs, universities and laboratories by providing access to the cultures in the collection on a cost-recovery basis. ESR will provide access to the reference collection except where access is clearly not to the benefit of New Zealand. In providing this access:

- ▶ the costs of collection, archiving and maintenance will be recovered only to the extent that they have not been paid for from public good funding
- ▶ the costs of the actual retrieval of information from databases and reference collections will be recovered in situations where a third party wishes to obtain large portions of information from a database or reference collection for direct commercial use, in which case ESR reserves the right to negotiate a copyright, royalty or licence fee.

ESR will not encumber or dispose of any national database or reference collection without the prior written consent of the shareholding Ministers, and will immediately notify the shareholding Ministers if, in the Board's view, it cannot reasonably maintain the integrity, security and quality of any national database or reference collection. ESR will remain responsible for the reference collection until after the shareholding Ministers have notified the Board of their determination regarding the future maintenance of, or access to, the database or reference collection.

ESR will ensure that shareholding Ministers are advised in a timely manner of any disputes over access to, or the use of, the reference collection held by ESR. Under the terms of the Transfer Agreement, shareholding Ministers can appoint a person with relevant expertise to decide the matter. Any such decision will be binding on ESR.

Investment of core funding

Based on the strategic refresh, core funding will be allocated to strategic projects where returns on investment can be realised relatively quickly. A robust commercialisation project analysis will be conducted and fed into core funding decisions.

Core funding (approximately \$7.7m in total per annum) will be allocated in the following ways:

- ▶ \$5.9m to fund directly our science work, including collaborations with other CRIs and universities.
- ▶ \$1.5m to prioritised strategic projects.
- ▶ \$0.3m to Pioneer Funding.

Our science work

Projects that will be funded through a contestable process will be in key impact areas for ESR where we have expertise and capabilities. Several areas have been identified as needing further investment, including investigating viruses and bacteria, applying omic technologies, developing surveillance tools, modelling solutions for forensic science, advancing molecular tests for authenticating meat products and developing groundwater modelling methodologies.

Our strategic projects

We have identified several strategic projects that will have a significant impact on our customers' work or have the potential to be commercialised. Some will allow us to upgrade or re-launch existing programmes or develop new products and services. These projects will also contribute to our overall technology and research capabilities.

Our Pioneer Fund

The Pioneer Fund was established in 2012 to encourage ESR staff innovation and research that might not be funded through the organisation's regular budget channels. The fund provides a small amount of funding (\$10,000 to \$30,000 per project). From 2015/16 the fund will be reduced to \$300,000 per year and preference will be given to projects where partners have been identified and there are clearly articulated plans for commercialisation.

Measuring our performance

This section sets out the way in which we will assess our performance, including financial and non-financial performance measures.

Financial performance

Financial measures

The five-year financial plan is underpinned by the strategic direction that ESR is proposing in response to the challenges presented (outlined in the section titled 'Strategic direction'). ESR aims to grow its revenue in the next five years to \$80.149m to ensure that the organisation can fund the science and research capabilities to deliver the sector impacts and client service required in the future.

In 2014/15 we have budgeted revenue of \$65.056m, rising to \$80.149m in 2018/19; earnings before interest and taxation of \$2.588m, rising to \$3.668m in 2018/19; and a return on equity of 4.8%, rising to 6.4% by 2017/18.

Our return on equity has been reduced historically as a result of ESR needing to invest significantly in infrastructure and core capabilities to ensure that we maintain and improve client service as well as meet compliance requirements, for example maintaining the health and safety of our premises.

Revenue

Two clients provide 60 per cent of ESR's revenue (the Ministry of Health and the New Zealand Police). It is necessary for ESR to broaden its revenue base to mitigate commercial risks and improve sector outcomes. While organic growth is expected to contribute to the planned future growth, the additional revenue is expected to come from developing partnerships in new sectors and offshore.

Operating expenditure

Operating expenditure is budgeted to increase from \$62.468m in 2014/15 to \$76.480m in 2018/19. Operating expenditure budgeted in the out-years is expected to reflect the activities needed to drive revenue growth. Expenditure as a percentage of revenue is budgeted to decline. Personnel costs

remain the largest component of our expenditure; staff numbers are expected to grow in line with revenue growth.

Balance sheet management

In the next two years ESR is budgeting for capital expenditure of 10.2 per cent of revenue. This is reflected in the capital renewal ratio, which measures the capital expenditure to depreciation ratio. The ratio is expected to remain in the vicinity of 100 per cent. This is a reflection of the need for ESR to reinvest to service existing clients and for future growth, including implementing the new computerised LIMS and reinvesting in ageing IT systems.

Cash flow

ESR continues to have strong operating cash flows. However, no debt is required at this stage to fund the extensive capital investment programme to strengthen the core science delivery and support future growth and new business initiatives. This has been achieved via the exiting of existing property portfolios.

Dividend

It is not anticipated that ESR will be in a financial position to have funds available for distribution due to the investments and capital projects planned that underpin the growth and financial sustainability of ESR.

Risks

- ▶ Sixty per cent of revenue is sourced from two clients within government. ESR has budgeted for a minimal increase in revenue from these sources. There is a risk that we will continue to invest in maintaining our capabilities and client service levels, yet will experience future reductions in revenue from the core contracts.
- ▶ Our budget assumes that we will be successful in achieving revenue growth (both organic and new) with our partners in the justice, health and food sectors, to help achieve economic growth for New Zealand.

Financial performance indicators 2014 – 2019

	Forecast 13/14	Budget 14/15	Plan 15/16	Plan 16/17	Plan 17/18	Plan 18/19
Revenue (\$000s)	62,455	65,056	69,804	73,446	77,28	80,149
Revenue Growth	–	4.2%	7.3%	5.2%	5.2%	3.7%
Operating Results (\$000s)						
Operating Expenses	56,349	56,523	60,591	62,623	64,614	69,818
EBITDAF	6,106	8,533	9,213	10,822	12,667	10,331
Depreciation and Amortisation	6,004	5,945	6,262	6,273	6,696	6,662
EBIT	102	2,588	2,951	4,549	5,971	3,668
Net Profit after Tax	66	1,910	2,142	3,697	5,056	3,458
Total Assets	52,807	56,665	59,372	64,860	73,566	79,734
Closing Shareholders' Funds	39,184	41,094	43,236	46,933	51,990	55,448
Capital Expenditure	5,723	7,303	7,600	3,795	5,845	11,755
Capital Expenditure % to Revenue	9.2%	11.2%	10.9%	5.2%	7.6%	14.7%
Liquidity						
Current Ratio	1.2	1.2	1.3	2.2	2.3	2.0
Quick Ratio (Acid Test)	1.0	1.0	1.0	1.9	2.1	1.8
Profitability						
Return on Equity	0.2%	4.8%	5.1%	8.2%	10.2%	6.4%
Return on Total Assets	0.2%	4.7%	5.1%	7.3%	8.6%	4.8%
Operating Margin	9.8%	13.1%	13.2%	14.7%	16.4%	12.9%
Operating Margin per FTE (\$)	15,998	21,481	23,993	28,110	32,902	27,549
Operational Risk						
Profit Volatility	–	23.4%	20.5%	22.6%	26.0%	23.2%
Coverage						
Interest Cover	N/A	N/A	N/A	N/A	N/A	N/A
Growth/Investment						
Capital Renewal	1.0	1.2	1.2	0.6	0.9	1.8
Dividend	–	–	–	–	–	–
Financial Strength						
Gearing (Debt/Debt Equity) %	N/A	N/A	N/A	N/A	N/A	N/A
Equity Ratio (Equity/Total Assets) %	63.66	73.3	72.7	72.6	71.5	70.1
Cash and Short-Term Deposits (\$m)	0.1	1.8	2.4	16.1	24.7	23.9
Debt (\$m)	–	–	–	–	–	–

Key: Statement of Corporate Intent Indicators

Non-financial performance measures

In addition to financial performance measures ESR will use a range of non-financial performance measures relating to impacts and outputs.

As a CRI ESR is required to report on the generic performance indicators outlined in the table below:

		June 2014 Forecast	Target 2014/15
End user collaboration	Revenue per full time equivalent (FTE) from commercial sources	\$21,995	\$25,170
Research collaborations	Publications with collaborators	62	65
Technology and knowledge transfer	Commercial reports per scientist FTE	.40*	.45
Science quality	Impact of scientific publications (measured using Web of Science citations for the 2013 calendar year).	3.2	3.3
Financial indicator	Revenue per FTE	\$163,637	\$163,766
	Commercial Revenue	8,379	9,999

**Figure does not include routine reports to our major clients e.g. weekly surveillance reports or police and toxicology reports.*

In addition to the generic indicators, ESR has identified a set of specific non-financial performance measures relating to each of our core outcomes. These measures and targets are mirrored in our contracts with major clients.

Key non-financial performance metrics for each of our core outcomes

Outcome	Measures	Target
Safeguard the health and well-being of New Zealanders	<ul style="list-style-type: none"> ▶ Ministry of Health and PHARMAC satisfaction with ESR is very good – as measured by survey ▶ Ministry of Health rates ESR's support for responses as good or better – as measured by responses ▶ Critical turnaround times are met consistently ▶ Laboratory result reports' delivery times reduced ▶ Wastage of Vaccine Schedule vaccines is minimised ▶ Meet Ministry of Health project brief milestones and deliverables according to contract 	<ul style="list-style-type: none"> ▶ Rated as 'Very Good' 60% of the time including a timeliness rating of 90%+ ▶ 90%+ rated as 'Good' ▶ 100% of critical turnaround times are met ▶ Time reduced by 20% ▶ <1% ▶ Meet 95% of milestones and deliverables
Increase effectiveness of forensic science contribution to justice sector	<ul style="list-style-type: none"> ▶ Offences submitted for comparison with the DNA Profile Databank are resolved within 30 days ▶ Police satisfaction with ESR services is high – as measured by survey ▶ The DNA link rate using the DNA Profile Databank link remains high ▶ Courts' satisfaction with the quality of ESR testimonies is high – as measured by survey ▶ ESR is seen to play a strong role in reducing volume crime 	<ul style="list-style-type: none"> ▶ 90%+ of offences are resolved ▶ 90%+ satisfaction rating including timeliness and quality of service ▶ 100% fulfilment of contractual obligations under the SLA for forensic services ▶ 70% to person and 33% crime to crime ▶ 90%+ rated 'Good' ▶ Volume crime submissions are doubled from 2013/14
Protect our food-based economy	<ul style="list-style-type: none"> ▶ Develop new tools and quantifiable metrics to differentiate New Zealand niche products ▶ Strengthen our relationship with Ministry for Primary Industries ▶ Engage more with food companies/ industry associations ▶ Consistently receive positive customer feedback 	<ul style="list-style-type: none"> ▶ Develop new IANZ accredited tests ▶ Grow our Ministry for Primary Industries business by 50% from the 2013/14 levels ▶ Grow our interactions and as a result increase revenue by \$1m per year ▶ 90% of customers rate their experience as positive
Improve the safety of freshwater and groundwater	<ul style="list-style-type: none"> ▶ Provision of an annual drinking-water report on compliance ▶ Respond to Public Health Service queries ▶ Active involvement in National Science Challenges ▶ New Zealand and international recognition of ESR Centres of Excellence 	<ul style="list-style-type: none"> ▶ Reports provided on time with high degree of customer satisfaction ▶ Prompt response to 400+ Public Health Service queries per year ▶ Address at least one National Science Challenge ▶ Surface & Ground Water; Water & Waste; Risk Assessment

Appendix 1

Statement of Core Purpose

ESR's purpose is to deliver enhanced scientific and research services to the public health, food safety, security and justice systems, and the environmental sector to improve the safety of, and contribute to the economic, environmental and social well-being of, people and communities in New Zealand.

Outcomes

ESR will fulfil its purpose through the provision of research and scientific services and the transfer of technology and knowledge in partnership with key stakeholders including government, industry, the community and Māori to:

- ▶ safeguard the health and well-being of New Zealanders through improvements in the management of human biosecurity and threats to public health (Outcome 1)
- ▶ increase the effectiveness of forensic science services applied to safety, security and justice investigations and processes (Outcome 2)
- ▶ enhance protection of New Zealand's food-based economy through the management of food safety risks associated with traded goods (Outcome 3)
- ▶ improve the safety of freshwater and groundwater resources for human use and the safer use of biowastes (Outcome 4).

Scope of operation

To achieve these outcomes, ESR is the lead CRI in:

- ▶ providing forensic science services
- ▶ preventing harm from drugs and alcohol
- ▶ surveillance of human pathogens and zoonotic diseases
- ▶ providing domestic and export food safety science in partnership with the regulator
- ▶ monitoring the impacts of the environment on human health including groundwater, freshwater and drinking-water quality and safe biowaste use
- ▶ integrating social and biophysical research to support decision-making in the environmental, public health and justice sectors.

ESR will work with other research providers and end-users to contribute to:

- ▶ assessing and responding to chemical, biological, radiological and explosive events and environmental threats, including adverse human impacts on natural resources
- ▶ biosecurity and freshwater management
- ▶ climate change adaptation and mitigation.

Operating principles

ESR will:

- ▶ operate in accordance with its Statement of Corporate Intent and business plan, which describe how ESR will deliver against this Statement of Core Purpose, and describe what the shareholders will receive for their investment
- ▶ meet its obligations as a Crown company and remain financially viable, delivering an appropriate rate of return on equity
- ▶ develop strong, long-term partnerships with key stakeholders, including government, industry and Māori, and work with them to set priorities for research and service delivery that are well linked to the needs and potential of its end-users
- ▶ maintain a balance of research and scientific services that both provides for the near-term requirements of its sectors and demonstrates vision for their longer-term benefit
- ▶ transfer technology and knowledge from domestic and international sources to key New Zealand stakeholders, including industry, government and Māori
- ▶ develop collaborative relationships with other CRIs, universities and other research institutions (within New Zealand and internationally) to form the best teams to deliver its core purpose
- ▶ provide advice on matters of its expertise to the Crown
- ▶ represent New Zealand's interests on behalf of the Crown through contributions to science diplomacy and international scientific issues and/or bodies as required
- ▶ seek advice from scientific and user advisory panels to help ensure the quality and relevance of its research and scientific services

- ▶ establish policies, practices and a culture that optimise talent recruitment and retention
- ▶ enable the innovation potential of Māori knowledge, resources and people
- ▶ maintain its databases, collections and infrastructure and manage the scientific and research data it generates in a sustainable manner, providing appropriate access and maximising the reusability of data sets
- ▶ seek shareholder consent for significant activity beyond its scope of operation.

Appendix 2

Business policies

ESR operates in accordance with the purpose and principles as stated in the Crown Research Institutes Act 1992 and has statutory obligations under other acts, including the Companies Act 1993 and Crown Entities Act 2004. Significant services are performed for the New Zealand Police under the Land Transport Act 1998 and the Misuse of Drugs Act 1975.

Policies and procedures are in place to ensure that all of our statutory obligations are met, including policies on:

- ▶ risk management
- ▶ shareholder consent for significant transactions
- ▶ intellectual property
- ▶ databases and collections
- ▶ dividends
- ▶ information to be disclosed
- ▶ accounting.

ESR's business policies are publicly available on the ESR website.

Appendix 3

Statement of significant accounting policies

Reporting entity

ESR is a Crown entity incorporated and domiciled in New Zealand. The address of its registered office is 34 Kenepuru Drive, Porirua.

ESR operates as a Crown research institute that provides specialist scientific solutions, including working with the New Zealand justice and health sectors to promote the protection of people and their environment.

Basis of preparation

The financial statements are Parent and Group financial statements. The two subsidiaries of ESR are dormant, non-trading entities; consequently, there is no difference between the financial statements of the Group and those of the Parent.

The financial statements have been prepared in accordance with the requirements of the Crown Entities Act 2004, the Crown Research Institutes Act 1992, the Companies Act 1993 and the Financial Reporting Act 1993.

The financial statements are prepared on the basis of historical cost, except for financial instruments as identified in the specific accounting policies and accompanying notes.

The financial statements are presented in New Zealand dollars and all values are rounded to the nearest thousand dollars (\$000).

Changes in accounting policies

Accounting policies have been applied on a basis consistent with the prior year. Where necessary, comparative figures have been reclassified for consistency with current-year disclosures.

Statement of compliance

These financial statements have been prepared in accordance with New Zealand Generally Accepted Accounting Practice. They comply with New Zealand equivalents to the International Financial Reporting Standards (NZ IFRS) and other applicable financial reporting standards, as appropriate for profit-oriented entities. These consolidated financial statements comply with International Financial Reporting Standards (IFRS).

Accounting estimates and judgements

The preparation of financial statements in conformity with NZ IFRS requires judgements, estimates and assumptions that affect the application of policies and reported amounts of assets, liabilities, income and expenses. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates.

Management's judgements, which have the most significant effect on amounts recognised in the financial statements, are found in revenue, employee benefits and taxation.

Revenue

The Group uses the stage of completion method in accounting for its fixed-price contracts to deliver scientific services. The use of the stage of completion method requires the Group to estimate the services performed to date as a proportion of the total services to be performed. Stage of completion is calculated and reviewed monthly, and significant variances are investigated to ensure that the stage of completion estimate is reasonable in line with the overall project plan, estimated completion date and prior measurements of progress.

Principles of consolidation

Subsidiaries

The consolidated financial statements incorporate the assets and liabilities of all subsidiaries of ESR and the results of the operations of all subsidiaries for the year then ended.

Subsidiaries are those entities controlled, directly or indirectly, by the Parent. Subsidiaries are consolidated from the date on which control is transferred to ESR. They are de-consolidated from the date that control ceases.

The acquisition method of accounting is used to account for the acquisition of businesses by the Group. The cost of an acquisition is measured as the fair value of the assets given, equity instruments issued, and liabilities incurred or assumed at the date of exchange. Identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition dates, irrespective of the extent of any non-controlling interest. The excess of the cost over the fair value of the Group's share of the identifiable net assets acquired is

recorded as goodwill. If the cost of acquisition is less than the Group's share of the fair value of the identifiable net assets of the subsidiary acquired, the difference is recognised directly in the Statement of Comprehensive Income.

Intercompany transactions, balances and unrealised gains on transactions between subsidiary companies are eliminated. Unrealised losses are also eliminated unless the transaction provides evidence of the impairment of the asset transferred. The accounting policies of subsidiaries are consistent with those policies adopted by the Group.

Property, plant and equipment

Items of property, plant and equipment are initially recorded at cost, and subsequently at cost less accumulated depreciation and impairment. The cost of property, plant and equipment includes the value of consideration given to acquire the assets and the value of other directly attributable costs that have been incurred in bringing the assets to the locations and condition necessary for their intended use.

The carrying amounts of property, plant and equipment are reviewed at least annually to determine if there is any indication of impairment. Where an asset's recoverable amount is less than its carrying amount, it will be reported at its recoverable amount and an impairment loss will be recognised. Losses resulting from impairment are reported in the Statement of Comprehensive Income.

Realised gains and losses arising from the disposal of property, plant and equipment are recognised in the Statement of Comprehensive Income in the periods in which the transactions occur.

Depreciation is charged on a straight-line basis at rates calculated to allocate the cost of an item of property, plant and equipment, less any estimated residual value, over its estimated useful life, as follows:

Type of asset	Estimated useful life
Land	not depreciated
Freehold buildings	20 – 50 years
Leasehold improvements	10 years
Plant, equipment and vehicles	3 – 10 years
IT equipment and internal software	3 – 10 years

Intangible assets

Computer software

Items of computer software that do not comprise an integral part of the related hardware are treated as intangible assets with finite lives. Intangible assets with finite lives are recorded at cost, and subsequently recorded at cost less any accumulated amortisation and impairment losses. Amortisation is charged to the Statement of Comprehensive Income on a straight-line basis over the useful life of the asset (between three and 10 years).

Customer contracts

The intangible asset 'customer contracts' represents the excess paid over net assets acquired under business combinations. The initial recognition of the intangible asset is stated at fair value. Subsequent to initial recognition, acquired intangible assets are stated at initially recognised amounts less accumulated amortisation and any impairment. Amortisation of acquired intangible assets is made according to the straight-line method over their estimated useful lives, not exceeding 10 years.

Research and development costs – internally generated intangible assets

Expenditure on research is expensed when it is incurred. Development expenditure incurred on an individual project is capitalised if the process is technically and commercially feasible, future economic benefits are probable and ESR intends to and has sufficient resources to complete development and to use or sell the asset.

Any expenditure capitalised is amortised over the estimated useful life, not exceeding 10 years from the point the asset is ready for use.

Impairment of non-financial assets

Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amounts may not be recoverable. An impairment loss is recognised for the amount by which an asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units).

Taxation

The income tax expense for the period is the tax payable on the current period's taxable income based on the national income tax rate for each jurisdiction.

This is then adjusted by changes in deferred tax assets and liabilities attributable to temporary differences between the tax bases of assets and liabilities and their carrying amounts in the financial statements, and unused tax losses.

Deferred tax assets and liabilities are recognised for temporary differences at the tax rates expected to apply when the assets are recovered or liabilities settled. The relevant tax rates are applied to the cumulative amount of deductible and taxable temporary differences to measure the deferred tax asset or liability. An exception is made for certain temporary differences arising from the initial recognition of an asset or a liability. No deferred tax asset or liability is recognised in relation to temporary differences if it arose in a transaction, other than a business combination, and at the time of the transaction did not affect either accounting profit or taxable profit or loss.

Deferred tax assets are recognised for deductible temporary differences and unused tax losses only if it is probable that future taxable amounts will be available to utilise those temporary differences and losses.

Deferred income tax assets are recognised to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilised.

Cash and cash equivalents

Cash means cash on hand, demand deposits and other highly liquid investments in which ESR has invested as part of its day-to-day cash management. The following definitions are used in the Statement of Cash Flows:

- ▶ Investing activities are those activities relating to the acquisition, holding and disposal of fixed assets and investments.
- ▶ Financing activities are those activities that result in changes in the size and composition of the capital structure of ESR, and this includes both equity and debt not falling within the definition of cash. Dividends paid in relation to the capital structure are included in financing activities.
- ▶ Operating activities are the principal revenue-producing activities and other activities that are not investing or financing activities.

Trade and other receivables

Trade receivables are stated at their estimated realisable value after providing against debts where

collection is doubtful. An estimate of the value of doubtful debts is made based on a review of debts at year end. Bad debts are written off in the period in which they are identified.

Inventories

Stocks of consumables and work in progress are stated at the lower of cost and net realisable value. Cost is determined on a first in, first out basis.

Trade and other payables

These amounts represent the best estimate of the expenditure required to settle an obligation arising from goods or services provided to ESR prior to period end. These amounts are unsecured and are usually paid within 30 days of recognition. Liabilities and provisions to be settled beyond 12 months are recorded at their present value.

Employee benefits

Wages, salaries and annual leave

Liabilities for wages and salaries, including annual leave that is expected to be settled within 12 months of the reporting date, are recognised in respect of employees' services up to the reporting date and are measured at the amounts expected to be paid when the liabilities are settled.

Obligations for contributions to defined contribution retirement plans are recognised in the Statement of Comprehensive Income as they fall due.

Long service leave, retirement leave and service leave

The liability for long service leave, retirement leave and service leave is recognised as an employee benefit liability and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date. Consideration is given to the expected future salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the reporting date for Government Bonds with terms to maturity and currency that match, as closely as possible, the estimated future cash outflows.

Leases

Finance leases transfer to ESR, as lessee, substantially all the risks and rewards incidental to ownership of a leased asset. Initial recognition of a finance lease results in an asset and liability being recognised at amounts equal to the lower of the fair value of the leased asset or the present value of the

minimum lease payments. Each lease payment is allocated between the liability and finance charges so as to achieve a constant rate of finance charge over the term of the lease. Property, plant and equipment acquired under a finance lease are depreciated over the shorter of the assets' useful lives and lease terms.

Leases in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged to the Statement of Comprehensive Income on a straight-line basis over the period of the lease.

Borrowings

Borrowings are initially recognised at fair value, net of costs incurred. Borrowings are subsequently measured at amortised cost. Any differences between the proceeds (net of transaction costs) and the redemption amount is recognised in the Statement of Comprehensive Income over the period of the borrowing using the effective interest method.

Borrowings are classified as current liabilities unless ESR has an unconditional right to defer settlement of the liability for at least 12 months after the balance date.

Share capital

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new shares or options are shown as appropriate in equity as a deduction, net of tax, from the proceeds.

Revenue

Sales of goods and services

Revenue is earned by ESR in exchange for the provision of outputs (services) to third parties.

Revenue from the supply of services is measured at the fair value of consideration received. Revenue from the supply of services is recognised in the accounting period in which the services are rendered, by reference to the stage of completion of each specific transaction assessed on the basis of the actual service provided as a proportion of the total services to be provided. Any revenue for which services have not been supplied as at the reporting date but for which payment has been received is deferred within the Statement of Financial Position as revenue in advance.

Core funding

ESR receives core funding from the Government in order to perform scientific research activities. Core funding (Government grants) are recognised in the Statement of Comprehensive Income on receipt.

Interest income

Interest income is recognised in the Statement of Comprehensive Income on a time proportion basis, using the effective interest rate method.

Vaccine revenue

ESR purchases vaccines on behalf of PHARMAC. PHARMAC maintains the risks and rewards related to the inventory and as such no inventory is recognised within ESR's Statement of Financial Position.

ESR receives and recognises commission revenue only in relation to the services performed.

Foreign currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates. The Group financial statements are presented in New Zealand dollars, which is ESR's functional and presentation currency.

Foreign currency transactions are recorded at the foreign exchange rates in effect at the dates of the transactions. Monetary assets and monetary liabilities denominated in foreign currencies are translated at the rates of exchange ruling at the end of each reporting period.

Non-monetary assets and non-monetary liabilities denominated in foreign currencies that are measured at fair value are translated to the functional currency at the exchange rate at the date that the fair value was determined.

Goods and Services Tax

Items in the Statement of Comprehensive Income and Statement of Cash Flows are disclosed net of Goods and Services Tax (GST). All items in the Statement of Financial Position are stated net of GST with the exception of receivables and payables, which include GST invoiced.

Dividends

A provision is made for the amount of any dividend declared on or before the end of the financial year but not distributed at balance date.

Financial instruments

The designation of financial assets and financial liabilities by ESR into instrument categories is determined by the business purposes of the financial instruments, policies and practices of management, the relationship with other instruments, and the reporting costs and benefits associated with each designation. The designations applied by ESR are reflected in the financial statements.

Financial assets

The Group classifies its financial assets as loans and receivables. Management determines the classification of its financial assets at initial recognition.

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They are included in current assets, except for maturities greater than 12 months after the reporting date. These are classified as non-current assets. ESR's loans and receivables comprise 'trade and other receivables' and 'cash and cash equivalents' in the Statement of Financial Position.

Regular purchases and sales of financial assets are recognised on the trade-dates – the dates on which the Group commits to purchase or sell the assets. Investments are initially recognised at fair value plus transaction costs for all financial assets not carried at fair value through profit or loss. Financial assets are derecognised when the rights to receive cash flows from the investments have expired or have been transferred and the Group has transferred substantially all risks and rewards of ownership. Loans and receivables are carried at amortised cost using the effective interest method.

The Group assesses at each reporting date whether there is objective evidence that a financial asset or a group of financial assets is impaired.

Financial liabilities

Financial liabilities held by ESR include trade and other payables.

Such financial liabilities are recognised initially at fair value less transaction costs and subsequently measured at amortised cost using the effective interest rate method. Financial liabilities entered into with durations less than 12 months are recognised at their nominal value.

Derivatives

Derivative financial instruments are recognised both initially and subsequently at fair value. They are reported as either assets or liabilities depending on whether the derivative is in a net gain or net loss position. ESR does not use hedge accounting, and as such derivatives are classified as held-for-trading financial instruments with fair value gains or losses recognised in the Statement of Comprehensive Income. Such derivatives are entered into for risk management purposes.

Provisions

Provisions are recognised when ESR has a present legal or constructive obligation as a result of past events; it is probable that an outflow of resources will be required to settle the obligation; and the amount can be reliably estimated. Restructuring provisions comprise employee termination payments. Provisions are not recognised for future operating losses.

Provisions are measured at the present value of the expenditure expected to be required to settle the obligation using a pre-tax rate that reflects current market assessments of the time, value of money and the risks specific to the obligation. The increase in the provision due to the passage of time is recognised as an interest expense.

Appendix 4

Directory

Directors

Dr Susan Macken – Chair
Ross Peat – Deputy Chair
Patricia Schnauer
Professor Bill Denny
Tahu Potiki
Marion Cowden
Dr Helen Darling

Chief Executive

Dr Keith McLea

Senior managers

Dr Keith Bedford, General Manager, Forensic
Dr Fiona Thomson-Carter, General Manager,
Environmental Health
Jude King, Acting General Manager,
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Steve Pyne, Chief Information Officer
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Solicitor

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