

Contents

Our purpose and role	1
Chair's report	2
Chief executive's report	3
Outcome 1: Health	4
Outcome 2: Forensic science	6
Outcome 3: Food safety	8
Outcome 4: Water and the environment	10
Human resources	12
Non-financial performance measures	14
Financials	22
Directory	53

Cover photograph:

From left: Judy Bocacao, Scientist, Communicable Disease; Dr Stephen Cordiner, Forensic Science Leader; Hilary Hamnett, Senior Scientist, Toxicology; and Dr Jeremie Langlet, Scientist, Environmental and Food Virology Group, Food Safety.



Protecting New Zealand's health and wellbeing
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Our purpose and role

Our purpose is to protect and enhance the nation's health and wellbeing by addressing challenges that require science-based innovations in health and disease, justice and security, food safety and integrity, and environmental health and hazards.

We have nationally and internationally recognised capabilities in infectious diseases, forensic science and science-based services. We are recognised and valued as an authoritative advisor on critical national reference science in health and forensics, food safety and quality issues, and have a unique role in protecting and defending New Zealand.

We are the sole source provider of forensic services to the New Zealand Police. Our services contribute to more effective justice sector operations and judicial outcomes, as well as more efficient justice sector processes. Our forensic expertise is increasingly being recognised internationally.

HEALTH AND DISEASE RISK PROTECTION

We safeguard the health of New Zealanders by working with others to improve the management of human biosecurity and public health threats. We are the principal science advisor to the Ministry of Health, undertaking many activities that underpin and inform Government responses, and decision- and policy-making. Our work includes the surveillance of human pathogens and zoonotic disease, as well as advice on the impacts of the environment on human health, including radiation; groundwater, freshwater and drinking water quality; and safe biowaste use. We help reduce the harm and costs involved with illness and lost productivity.

FOOD SAFETY AND INTEGRITY

We help protect the New Zealand economy and grow the country's competitive advantage in overseas markets. We do this by helping address challenges to domestic and export food production systems. We also help maintain access to key export markets, in partnership with the Ministry for Primary Industries and New Zealand food manufacturers, processors and distributors.

OUR APPROACH

As well as our work supporting government agencies to improve their services and operations, we work with clients in central and local government, industry organisations and the private sector.

We take a project-based approach, bringing together the best team to tackle tasks, whether they involve research, stakeholder engagement, service delivery or evidence for policy. We value our reputation for engagement and collaboration with Māori, particularly on health- and water-related research projects with social impacts.



145,512

INDIVIDUALS ON
DNA PROFILE
DATABANK



5,721

SUPERBUGS TESTED
IN THE ANTIBIOTIC
REFERENCE
LABORATORY



187

FOOD FORENSIC
INVESTIGATIONS



390

FTE STAFF ACROSS
FOUR SITES

ESR is a Crown research institute (CRI). It was incorporated in July 1992 and is wholly owned by the New Zealand Government. The two shareholding ministers appoint a board of directors to govern the organisation. ESR has scientific facilities in Auckland, Wellington (Porirua and Wallaceville) and Christchurch.

Chair's report



ESR turned twenty on 1 July 2012. This milestone year has been a chance for us to reflect on our place in New Zealand, to continue planning for the future and laying the foundations for getting there.

As we celebrated our 20th anniversary, we reflected on how far ESR and other Crown research institutes (CRIs) have come since they were established in 1992. There have been some major science advances over the past 20 years. A notable change is how economic drivers are now central to the way we work.

Over the past year, we began implementing our 2012-2017 Strategic Plan to reposition the organisation from scientific testing to science-based innovation. The Government has indicated that science and innovation are key to generating growth in New Zealand and CRIs will play a vital role in helping achieve this growth. The announcement of the Government's National Science Challenges presents the opportunity for us to take a leadership role.

This year we have partnered with industry and organisations to expand our role and develop new technologies. There are some significant examples, including the major role we have in helping to protect New Zealand's billion dollar beef export trade to the United States, which has introduced

new, more stringent regulations for seven groups of *E. coli* bacteria found in beef.

Our partnership with the New Zealand Customs Service to provide advice and scientific testing to stop illicit drugs entering New Zealand is a good example of how we can work strategically with other agencies to extend services and increase effectiveness.

Our research partnerships are generating world-leading results. We worked with an Australian laboratory to develop STRmix DNA analysis software and the SHIVERS influenza research project we lead successfully completed its first year. I am also proud that we are taking our expertise beyond New Zealand to our Pacific neighbours – our Healthy Tonga Tourism project is helping build Tonga's tourism sector.

The National Radiation Laboratory (NRL) is now a fully integrated part of ESR and a new contract for NRL's services has been negotiated and agreed with the Ministry of Health. This has brought in an additional \$6 million dollars of revenue for ESR in the past year.

Our revenue for the past year is slightly less than budgeted. A major factor in this result is that revenue from our core government customers has remained static.

This highlights a key challenge for us to continue growing revenue outside our core client base. A focus over the past year has been investing for ESR's future, both with upgraded facilities in Auckland and Wallaceville, as well as investment in staff development and recognition.

We have made major advances over the year, both scientific and as an organisation. Thanks go to our CEO Graham Smith for his leadership, the outstanding ESR staff and the Board for its support and guidance. I especially acknowledge Judith Johnson who departs the Board having played a key role chairing the Audit and Risk Committee.

A handwritten signature in blue ink, reading "Susan Macken".

Susan Macken
Chair

Chief executive's report

As New Zealand's 'human-focused' Crown research institute, ESR's science and innovation helps to keep New Zealanders safe in their homes and communities, protects them from getting sick and reduces crime and reoffending. As a food producing nation, our science is also critical to our success as a globally recognised producer of safe food for world markets.

ESR continues to build a stronger organisation. This year has seen a significant strengthening of our leadership capabilities with changes within our Senior Leadership Team, our ongoing investment in core infrastructure and systems, improved engagement with customers, and science refreshed by a new Strategic Science Team.

The SHIVERS project continues to be one of our most high-profile and influential projects. Its success was this year rewarded with an increased investment by its United States funders to extend the scope of the project.

You will read about other world-leading initiatives and successes in this report. Things like revolutionary DNA profiling tool STRmix and the use of phages to protect our meat export industry have great potential for us and our customers. We now have four commercialisation projects underway.

We must stay at the forefront of international science research so we can anticipate and meet our customers' needs in the future. This year we have done several things to support that goal. Our new Strategic Science Team (SST) aims to support and increase our science innovation.

The SST established a fund to support our staff to explore new ideas that both transfer technology or knowledge to industry or government sectors and open new commercial opportunities for ESR. The Pioneer Fund makes up to \$30,000 available to our staff for projects that fit our strategy and future funding, address an important problem, have high scientific merit, and involve those who will use the information



to provide solutions. Some exciting projects are underway.

We have done some important work on our own capabilities. We started a process to improve our management skills, strengthening the organisation and positioning it for future growth. Our most senior managers are receiving this training throughout 2013.

The investment in our infrastructure and business systems that we started last year has continued. The refurbishment of the Mount Albert Science Centre in Auckland is complete and already enhancing the services we provide our customers.

To continue to provide the best services and accelerate our ability to do so, we must stay in touch with our current customers and actively recruit new ones. This year we appointed four business development managers. These ESR representatives speak both the language of science and that of business. Their brief is to develop our business by helping our customers develop theirs.

In the last annual report I was pleased to welcome the National Radiation Laboratory (NRL), which we acquired from the Ministry of Health in 2011. NRL is now embedded in ESR and working right across the organisation. Its services range from

testing the safety of workplace equipment, to measuring radon in groundwater, to monitoring nuclear activity in the Pacific. NRL's offering is enhanced by being part of ESR and, with our collaborative approach, the rest of the organisation is reaping the benefits of new colleagues with complementary skills.

As I talk to some of the many stakeholders and partners whose work would not be possible without our behind-the-scenes contribution, they are often surprised to discover that their view of ESR is only one facet of what we do. As we guard the country from infectious diseases, ensure your food is safe, or protect our meat export industry, we also have teams dismantling clandestine drug laboratories and gathering crime scene evidence. This is the work our teams do day in and day out. It is our significant contribution to New Zealand's health and wellbeing – both social and economic.

A handwritten signature in blue ink, which appears to be 'Graham Smith'. The signature is stylized and fluid, written over a white background.

Graham Smith
Chief Executive

Health

We help safeguard the health of New Zealanders through improvements in the management of human biosecurity and threats to public health.

Our contracts with central government provide health services to key government health and biosecurity agencies. At a local level, we also provide key health science services to district health boards and local government.

As well as analytical work, the Ministry of Health engages us to provide an overview of the levels of infectious disease in New Zealand and help respond to critical health situations, such as pandemics.

EVER ALERT

We are at the front line of the battle against new and emerging diseases and evolving viruses, protecting New Zealand, and in some cases the world, against a host of organisms. Our vigilant team of laboratory-based scientists, who are always alert to new pathogens, diseases and outbreaks, had a busy and successful year.

The Southern Hemisphere Influenza Vaccine Effectiveness Research and Surveillance (SHIVERS) influenza research project released the preliminary findings from its first year. The findings revealed important new information about the burden of the flu on New Zealand as well as generating useful information for vaccine strain selection. For example, the SHIVERS study showed high influenza hospitalisations and low vaccine uptake for children under five. As a result, the Ministry of Health has asked pharmaceutical management agency PHARMAC to extend the eligibility of free influenza vaccines to this age group. Findings could also influence case definitions of influenza and influenza-like illness drafted by the World Health Organization (WHO) for international public health.

United States funders, the United States Centers for Disease Control and Prevention (CDC), were very pleased with the progress on the SHIVERS project, which secured an additional US \$500,000 in funding for the

second year of the five-year project (US \$1.5 million for year two). The first year of the study focused on patients hospitalised in Auckland with severe acute respiratory infections (SARI). With the additional funding the study has been extended to the primary care system as well as a hospital-based one. The study's findings are useful for New Zealand's response and planning as well as international preparedness.

The influenza team also kept a close eye on the H3N2 influenza variant in the United States and the H7N9 influenza virus in China. Part of our role on behalf of the Ministry of Health is to maintain close international links with those involved in the responses to these issues and have relevant diagnostic and reference tests to ensure that New Zealand is well placed to diagnose any new influenza viruses and to contribute to the management of any outbreaks.

The team was also on top of a new norovirus strain in 2012, helping scientists from the University of New South Wales discover the Sydney 2012 strain. We are providing important information to colleagues overseas who are working on a norovirus vaccine.

On another front, we are constantly monitoring *Salmonella* cases through our national EARS (Early Aberration Reporting System) service. At the end of the year, there was a spike in the number of reported *Salmonella* cases that sent our Health Intelligence Team into investigation mode. Their early discovery of identical strains of *Salmonella* Montevideo and identification of the source – a specific brand of imported tahini – led to product recalls that ultimately saved lives and reduced the human and healthcare costs of a more widespread outbreak. On cases like this, our teams work across the organisation to get the best expertise on the job. Teams in our Health and Food Programmes coordinated closely to respond with the necessary speed and accuracy.

A recent paper published by one of our scientists on how we solved the 2008 mystery of *Salmonella* caused by people eating raw flour products, such as baking batter, drew international attention and acclaim. The forensic skills of our Health and Food Programmes continue to save lives and reduce illness.

PROTECTING NEW ZEALANDERS

With our acquisition of the National Radiation Laboratory (NRL) in December 2011, ESR became New Zealand's experts in radiation science. The purchase was a natural fit for us as radiation is something that has an impact on New Zealand's environment and the health of people who live here. NRL's work links well with our food, water, forensics and health programmes.

Our NRL team is involved in a wide range of work. We train people, such as emergency services, the army and other users of radiation sources, on how to work safely with and around radiation. This year over 100 people attended courses like these. NRL's other services include the calibration of radiation equipment, personal dose monitoring, analytical testing and scientific advice to government and the public.

Our scientists also monitor for illegal nuclear tests or other nuclear releases as part of a contract with CTBTO (Comprehensive (Nuclear) Test Ban Treaty Organization). We were nominated for this prestigious role by the Ministry of Foreign Affairs and Trade. In February this year, our scientists were on the lookout for evidence of nuclear tests conducted by North Korea.

We're establishing new international links, with two of our scientists appointed by the International Atomic Energy Agency (IAEA) in 2013 as coordinators for research activities in the Asia Pacific region. NRL's role in this international organisation is recognition of the high level of expertise our scientists have in this field.



19,242
CASES OF
NOTIFIABLE
DISEASES



5,721
SUPERBUGS TESTED
IN THE ANTIBIOTIC
REFERENCE
LABORATORY



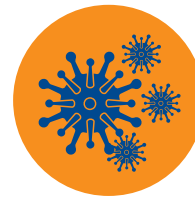
1,045,440
DOSES OF VACCINE
DISTRIBUTED
FOR NATIONAL
IMMUNISATION



4,615
BACTERIA AND FUNGI
STRAINS HELD IN
THE NZ REFERENCE
CULTURE COLLECTION



94,931
PERSONAL
DOSEMETERS ISSUED
FOR RADIATION
WORKPLACE HEALTH



672
INFLUENZA VIRUSES
WERE ANTIGENICALLY
TYPED AND
SUBTYPED

ADAPTING TO CLIMATE CHANGE

Another world-first project, the Health Analysis and Information For Action (HAIFA) project, has delivered its proof of concept resource system. HAIFA was a four-year project funded by the then Foundation for Research, Science and Technology. It aims to reduce New Zealand's vulnerability to the human health impacts of both climate change and variations in climate caused by seasons and weather patterns.

We led this project, working with NIWA, Landcare Research, Massey and Waikato universities, as well as Australian universities and the World Health Organization. As well as delivering research, we funded and supervised post graduate students working on the project.

The HAIFA project delivered several reports and associated tool development; international peer reviewed scientific publications and conference presentations; as well as a geographic information system (GIS) web-based interface. The interface can carry out 'what if' scenarios for 2015, 2040 and 2090 to within 25 square kilometres for six diseases under different climate change projections – campylobacteriosis, cryptosporidiosis, meningococcal disease, influenza, and Ross River and dengue fevers.

HAIFA was the first international project of its kind, demonstrating the quality and importance of New Zealand science capability. At home, HAIFA will help central, regional and local authorities respond to potential infectious disease risks associated with climate variation and change.

In the future, HAIFA could be extended to include other human health risks associated with climate change and provide real-time early warnings or predictions using linked data sources.

“ESR’s work behind the scenes underpins a broad range of health work in New Zealand. There’s a high level of trust and respect in the sector for the work they do. ESR’s experience, knowledge and advice makes it a valuable partner for the Ministry of Health. We work together on many levels and combine our knowledge and skills to protect New Zealand health.”

Dr Don Mackie
Chief Medical Officer
Ministry of Health



Deborah Williamson

MAKING CONNECTIONS

According to clinical microbiologist Deborah Williamson, now is an exciting time to be working in science and working at ESR. “There’s a lot happening in this field,” says Deborah. “There are emerging new technologies in the field of microbiology that have huge implications for diagnosis, treatment and surveillance of infectious diseases.

“New Zealand’s incidence of infectious diseases is higher than other developed countries, with a substantial clinical and economic burden on the country. ESR has an important role to play in working with other agencies on the issues.”

Deborah is a clinical research fellow doing a PhD at the University of Auckland and applies what she learns in her part-time role at ESR. Her particular field of interest and the subject of her PhD is the clinical and molecular epidemiology of infections caused by *Staphylococcus aureus*.

“My role at ESR is to help make the connections between research science and what’s happening out there in New Zealand. It is easy for these two streams to go on in isolation, when they should be working together.”

Forensic science

We increase the effectiveness of safety, security and justice investigation processes through forensic science.

Our forensic science services are important partners to the New Zealand justice system. The contracts we have with key government agencies support the sector in meeting its outcomes.

We help the New Zealand Police meet its key forensic and crime reduction priorities. The Department of Corrections uses our services to help reduce prison inmate drug use. We provide the Courts service of the Ministry of Justice with scientific evidence to inform the criminal justice process. And we support the New Zealand Customs Service in border control activities, particularly with information on drug seizures.

NEW DNA SOFTWARE HELPING SOLVE CRIMES

Our STRmix DNA interpretation software is a crime solving breakthrough. We've been developing the software with Forensic Science South Australia. Already it has been put to use solving crimes. STRmix's key feature is that it can interpret DNA mixtures from up to four people. The software applies mathematical modelling and DNA interpretation to achieve results not possible before.

Our scientists have developed a new function that allows the software to match the mixed DNA profiles directly against the DNA Profile Databank (DPD). This is a breakthrough for cases where there are no suspects and there is DNA from multiple individuals in one sample.

STRmix can solve crimes using evidence that previously was considered too complex to interpret. For example, imagine that following a crime, a shopping bag is found at the scene. Forensic scientists swab the bag's handles and find DNA traces from two people. STRmix analyses the swabs, along with a sample from a suspect, and identifies the person responsible. The software has solved real crimes using similar evidence.

Laboratories in Australia, United States, Europe and the UK are interested in STRmix. The United States Army sent a team to Auckland for a workshop at our Mt Albert laboratory to learn more about the software. Following the workshop, the army purchased a one-year licence for the software.

With STRmix we can now analyse complex DNA evidence, identify more criminals and help police solve and prevent even more crimes.

STOPPING CRIME AT THE BORDER

We're pleased to be recognised as the New Zealand Customs Service's science advisors. Over the past four years, we have worked closely with Customs to help stop drugs and illegal items at the border. Our role has now expanded from just providing laboratory tests to now providing trusted advice. We are finding new ways to use drug intelligence, training Customs staff to identify drugs and making sure the service is using the most effective equipment for its needs.

Our partnership with Customs is expanding the service's use of science and technology. The drug identification equipment trials at Auckland Airport, Customs' Auckland container inspection facility and the international mail centre this year are good examples. Our scientists were there to interpret results and offer immediate advice. We were then able to advise Customs on which equipment best meets its needs, ensuring the right decision was made first time. Customs is pleased with the result, which it attributes to our scientists working closely beside them to assess the equipment.

Our relationship with Customs is growing, potentially leading to us providing more services in the future and helping them achieve even better outcomes.

REDUCING REPEAT ALCOHOL AND DRUG OFFENCES

A pilot project to rehabilitate repeat alcohol or drug offenders started in November 2012 with the first drug tests received at ESR a month later. With the commissioning of new supporting systems we are now well into a three-year contract with the Ministry of Health to provide random drug and alcohol testing to people doing rehabilitation who have been released into the community.

The Alcohol and Other Drug Treatment Court (AODTC) initiative in the Auckland and Waitakere areas has an annual budget of \$2 million and supports the Government's plan to reduce crime and reoffending by 15 percent over the next five years. We provide real-time monitoring and screening of repeat alcohol or drug offenders who would otherwise be given custodial sentences. Early results have shown a high compliance and reduced drug and alcohol use.

Our services include urine testing for drug use and alcohol monitoring using secure continuous remote alcohol monitoring (SCRAM) anklets that send continuous data for interpretation and reporting. Because of the programme's success, it is expected to be opened up to more participants.



145,512
INDIVIDUALS ON
DNA PROFILE
DATABANK



3,684
CORONIAL CASE
SAMPLES



7,234
SAMPLES TESTED
FOR ALCOHOL



66
PARTICIPANTS OF
THE AODTC* PILOT
MONITORED FOR
DRUGS AND ALCOHOL



71%
SUCCESS AT LINKING
A PERSON TO A CRIME
THROUGH DNA



30%
SUCCESS AT
LINKING A CRIME
TO ANOTHER CRIME
THROUGH DNA

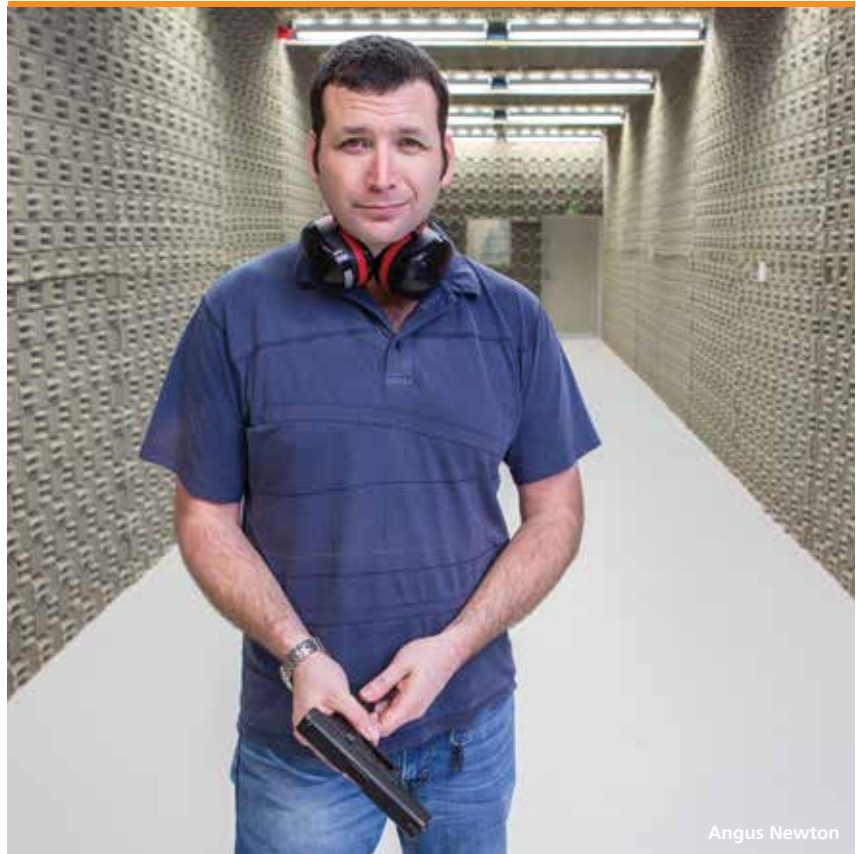
“When ESR developed the STRmix DNA analysis software, we put it to use examining unsolved burglary and theft cases in the Waikato, with outstanding results.

“Every time you catch a burglar you stop them committing more offences and creating more victims. The leads we get from ESR’s STRmix software helps us disrupt criminal offending by identifying active offenders.

“There has been a huge investment to build a DNA database, which holds over 100,000 individual profiles. The STRmix software is another way to make the best use of that investment.

“The development of STRmix and ESR’s world-respected turnaround times are really helping police solve crimes.”

**Roger Coley, Sergeant
New Zealand Police**



Angus Newton

ANGUS NEWTON – ESR SENIOR FORENSIC SCIENTIST

ESR Senior Forensic Scientist Angus Newton feels lucky to do the work he does. As part of the Physical Evidence Team based in Auckland he looks at items of forensic interest such as firearms, tool marks or traces of paint, glass or fibres.

“We work with many different evidence types so the work is always interesting,” he says. “Sometimes we attend firearm-related crime scenes and work with the police to reconstruct an event, which is fascinating.”

Angus joined ESR in 1997. He has seen major advances in forensic science since then. “There have been huge advances in technology since I’ve worked in this field,” he says. “We can now analyse smaller samples faster and get better results.”

Angus has appeared in court to give evidence. “Our role there is purely to

present the evidence and provide an expert opinion. The outcome of a trial is up to the court process and, as scientists, is not our focus.

“The rewarding part is to know you’ve done your job to the best of your ability. It’s satisfying that we can present sound scientific evidence and opinions that contribute to the accuracy of court decisions.”

Angus values the rich collaboration with his ESR colleagues and the positive relationship they share with the police. The challenge of the work also makes his job interesting and rewarding. “Our work is varied. While there may be some similarities, no two cases are the same. So we approach each case afresh but with the experience of a skilled and knowledgeable team behind us.”

*New Zealand Alcohol and Other Drugs Treatment Court

Food safety

We help protect and enhance the reputation of New Zealand's food industry by ensuring safety and quality.

To protect New Zealand's food export trade we work with the industry to help it meet and exceed food safety standards set by importers of New Zealand products. The Ministry for Primary Industries relies on our science services to inform and help deliver its risk management framework.

We also help assure New Zealanders about the safety and integrity of the food they eat. As well as delivering the New Zealand Total Diet Study, we've invested heavily in both the biocontrol programme for foodborne pathogens for exported food, and developing new rapid identification and diagnostic techniques for these pathogens.

GIVING NEW ZEALAND MEAT EXPORTERS THE SEAL OF APPROVAL

This year, we again played a major role in protecting New Zealand's meat export market to the United States. From 4 July 2012 new United States legislation now requires meat imports to have been tested for seven types of pathogenic *E. coli*. These 'Super 7' types are some of the most common types of *E. coli* in the United States and not tolerated on meat imports.

We provide verification services for all New Zealand meat producers exporting to the United States. Samples are sent to our National Centre for Biosecurity and Infectious Disease (NCBID) based at Wallaceville in Upper Hutt. Our reference laboratory is the only one of its kind in New Zealand. We have also been working with industry on a new DNA-based test for detecting and confirming these seven pathogenic types more quickly and efficiently. This could help lower the costs to industry and speed sign-off for meat shipments. A patent application has been filed for the new test. While it is still under development, results are now being compared to existing methods from a multicentre trial and look promising for the future.

In a related project, we are leading the development of phages for meat. Phages are microorganisms that target specific types of bacteria, for example *E. coli* and other pathogenic bacteria. We have been researching the use of phages for the last 10 years and in the coming year will hold the largest-ever field trials with the support of the Meat Industry Association, the Ministry for Primary Industries, and the Ministry of Business, Innovation and Employment (MBIE).

MEAT SCANDAL INCREASES DEMAND FOR SERVICES

In the past year, demand has grown for services identifying food ingredients. In February 2013, European consumers began questioning food products when horse meat was discovered in a popular range of beef lasagne convenience meals. The scandal grabbed headlines as it spread across Europe with authorities discovering more mislabelled food, damaging the reputation of the food industry and many businesses.

This prompted New Zealand media to question the contents of New Zealand meat products. We have the only laboratory in New Zealand with DNA-based technology sensitive and specific enough to authenticate different food types. Three media outlets brought in samples for testing. We were able to confirm that the products did contain the ingredients stated on the packet and were free from horse meat. However, very minute traces of two meats not listed on packaging were identified in one product, proving the sensitivity of our testing.

The European food scandal has highlighted questions about the content of food, with wide implications for the industry. Supermarkets – both in New Zealand and internationally – are beginning to demand that the products are tested for purity and to authenticate ingredients. Consumers also want reassurance that their food is what it claims to be. For some, this is a matter of

principle – such as religious observances – for others it's a matter of life and death, as in the case of food allergies. These customers need to know the food they purchase is legitimate.

In the coming year we will invest in further developing a 'Prove It' service, so that consumers and businesses in New Zealand can be assured of the integrity of their products.

PROTECTING NEW ZEALAND BY MONITORING FOODBORNE VIRUSES

Noroviruses are a common cause of acute gastroenteritis and are the leading cause of foodborne-disease outbreaks globally. These viruses cause diarrhoea and vomiting in all age groups and are highly contagious. Noroviruses commonly cause outbreaks in rest homes, schools, hospitals, childcare centres and on cruise ships, and can be hard to contain. Food and water can become contaminated with noroviruses and can be a source of gastroenteritis outbreaks. For example, shellfish such as oysters can become contaminated with noroviruses when grown in polluted waters. Other foods implicated in norovirus outbreaks include fresh leafy green salads, berries and other foods served raw or ready to eat.

Our Norovirus Reference and Environmental and Food Virology Laboratories help health authorities with norovirus outbreak investigations by providing information to track the spread and contain outbreaks. We also screen imported shellfish for norovirus to protect consumers from harm.

We are part of Noronet – a global surveillance network that identifies and shares information on circulating and emerging norovirus strains, including those that are likely to cause epidemics. As well as working to limit the impact of norovirus, Noronet also detects common sources of foodborne outbreaks globally.



285
SUSPECTED
FOOD POISONING
EPISODES
INVESTIGATED



6,865
TESTS PERFORMED
FOR THE BILLION
DOLLAR EXPORT BEEF
INDUSTRY



187
FOOD FORENSIC
INVESTIGATIONS



929
RADIATION-FREE
CERTIFICATES ISSUED
FOR FOOD EXPORTS



1,494
FOOD OR BEVERAGE
SAMPLES EXAMINED
FOR CHEMICAL OR
MICROBIAL HAZARDS



>1m
CASES OF
FOODBORNE
ILLNESS ESTIMATED

In February 2012, our scientists identified a new variant of the virus circulating in New Zealand. This virus became an epidemic strain globally, and was named the GII.4 Sydney_2012 variant. We monitored the strain and identified the large increase in reported outbreaks in mid-September. Our laboratory confirmed 45 outbreaks in October 2012 – a record for New Zealand. In total, half the outbreaks of norovirus recorded in New Zealand in 2012 took place in the last quarter of the year.



Angela Cornelius

A ROBUST AND RELEVANT SERVICE

Scientist Angela Cornelius defines the scientist's dilemma with a story. She lives in Rolleston, Canterbury, with her family. The local council issued a 'boil water' notice for the town one Sunday night. Realising that the previous day her husband had put water in bottles into the refrigerator to chill, Angela decided to test the water for bacteria. "Just out of interest," she says.

Angela's young son was intrigued and asked her whether she wanted to find bugs in the water, or not. "I explained to him that as a citizen of Rolleston I didn't want there to be a problem with the water. But as a scientist I am fascinated by challenges like bacteria in a water supply because then the chase would be on to find out why."

Angela has been at ESR for 19 years. At a critical point in her career she had to make a decision about whether to go down a management path or a research science one. She chose research. Angela's passion for science is about two things: "It's about protecting people through science. It's also about the thrill of the chase and the disciplined process of finding answers."

Some of Angela's work this year has been commercialising test systems for bacteria. One especially excites her. The *Campylobacter* MBiT genotyping system

can type *Campylobacter* in just one day, instead of the usual three to five days, and at a fraction of the cost. Speed in genotyping means measures can be put in place faster to contain the cause. In New Zealand, campylobacteriosis is estimated to cost over \$25 million each year in lost work days. The new system had a real-life trial when multiple cases of diarrhoeal illness in and around the Darfield area indicated a potential common cause. The *Campylobacter* MBiT found DNA "fingerprints" in just a few hours. The fingerprints showed a common source and helped confirm it as a contaminated water supply.

"The *Campylobacter* MBiT system has huge application worldwide. There is nothing out there that works quite like this one and it could completely change the way we subtype bacteria, meaning a greater understanding of sources of, and better interventions to reduce the rate of illness.

"I like many things about working at ESR, but one in particular is outstanding. We work together across the whole organisation. Even though I'm in the food team, I work closely with people in the water, health and forensic teams. It's about the right people working on projects and building a robust and relevant service for our clients and our society."

“Greenlea Premier Meats has had a 20-year association with ESR. Whenever we need advanced testing, such as genotyping, we go to ESR. Currently, the meat industry is working with them on a project that may offer greater market protection for our products.

“ESR's phage project aims to eliminate *E. coli*, an issue that is very important to our business and the industry. Potentially, this project will counter both *E. coli* and the impact this can have on market access. It's hard to quantify the value of this project, but it has the potential to mitigate a huge concern for the industry and help us protect valuable international markets.

“ESR has built a strong reputation based on its science. We see them as the science experts who offer both high level analysis and also thought leadership to guide the industry into the future.”

Tony Egan
Managing Director
Greenlea Premier Meats

Water and the environment

We improve the safety of freshwater and groundwater resources for human use, as well as improving biowaste management.

We support the many organisations in New Zealand responsible for environmental health. Our advice, analysis and research also inform Ministry of Health and Ministry of Business, Innovation and Employment (MBIE) policies on a range of critical environmental health issues.

We also have an important role in making connections and coordinating research and information across the many agencies that participate in environment and health. We lead groundwater research in collaboration with other CRIs and universities, and help integrate freshwater research in partnership with Māori.

MEASURING RADON TO HELP COUNCILS MAKE VITAL WATER DECISIONS

We have established a fund to explore new ideas that both transfer technology or knowledge to industry or government sectors and open new commercial opportunities for ESR. The Pioneer Fund makes up to \$30,000 available to our staff for projects that fit our strategy and future funding, address an important problem, have high scientific merit, and involve those who will use the information to provide solutions.

One of the first Pioneer Fund projects was a collaboration with Environment Canterbury. The project is trialling the measurement of radon to gauge surface water recharge to groundwater.

The surface water from braided rivers, such as those in Southland, Canterbury, Nelson/Marlborough, Wairarapa and the Hawke's Bay, constantly replenishes the groundwater along some sections of their length. In order to make important decisions about water allocation, local bodies would benefit from knowing how much water is being replenished. Until now, this has been hard to measure.

Using the specialised equipment and expertise of our newly acquired National Radiation Laboratory, the project is measuring small quantities of radon-222, which has a half life of 3.8 days. Radon occurs at very low levels in surface water, but as it recharges into groundwater its levels increase through interaction with mineral grains in alluvial gravels.

If groundwater is sampled at different points over a specified time, the radon levels can be used to estimate the amount of flow occurring under the ground.

The project is still in progress, but so far measurements support the hypothesis. If this proves to be a good estimation method, the measurement of radon could give regional councils another method to help with water allocation decisions.

THE SCIENCE OF PUBLIC HEALTH

Our contract with the Ministry of Health includes advising public health units in district health boards. This advice can range from drinking water assessments to advice on resource consent applications. All our advice relates to public health but can have wider economic and other impacts as well.

This year we've assisted public health units to respond to resource consent applications under the Resource Management Act. We help them identify and assess potential risks to public health from proposed activities. Our contribution helps manage the risk/benefit challenge and ensures the community is dealing with the best available information, meaning negative impacts are managed and industry and businesses can develop.

Our scientists have once again been called in to advise on a number of cyanobacterial blooms in New Zealand waterways. These organisms can increase to very large numbers under suitable conditions and many species can produce toxins that irritate the skin or attack the nervous system and

the liver. We can advise whether sampling is needed to assess public health risk and how sampling should be done. As well as their health impact, dense cyanobacterial blooms can have a negative effect on tourism.

An important public health role for us is giving advice on drinking water supplies. This year we were approached for advice on the reasons for treatment failure, the tests needed to determine necessary treatment and the interpretation of water quality data to identify appropriate treatment.

We also empower health protection officers and drinking water assessors with training, ensuring those who do the work have the most up-to-date scientific information. This year we provided training at four national training workshops.

PUTTING WASTE TO WORK

In 2012 we took a leading role in establishing and funding the Centre for Integrated Biowaste Research (CIBR). The centre is a collaborative centre of excellence with an active and practical research programme. It brings together a multi-disciplinary team of scientists and researchers from ESR, Scion, Cawthron Institute, Landcare Research, Lincoln University, Lowe Environmental Impact, Northcott Research Consultants Ltd, and Whenua.biz.

New Zealand produces nearly 700,000 tonnes of biowaste each year. This organic, biodegradable waste includes sewage sludge and greywater, as well as organic industrial and agricultural waste. Sixty-two percent of this waste currently goes to landfill, more than half the total waste filling our landfills each year.

If biowaste is properly treated it can be a valuable source of soil nutrients and play a useful role as a sustainable soil conditioner. New Zealand is falling behind other countries in the reuse of biowastes



10
COLLABORATORS
IN CIBR*



>200
PUBLIC HEALTH
QUERIES ANSWERED



3
PACIFIC NATIONS
ASSISTED TO IMPROVE
PUBLIC HEALTH
OUTCOMES



2,218
DRINKING WATER
SUPPLIERS SUPPORTED
TO MEET REGULATORY
REQUIREMENTS



996
TESTS IDENTIFYING
WATER
CONTAMINATION
SOURCES



7,000
WELLS THAT
SUPPLY DATA FOR
ANALYSIS

such as biosolids, the treated solid waste from municipal sewage treatment plants. In Australia for example, only 15 percent of biosolids are sent to landfill, with more than 65 percent being productively reused in agriculture and compost and a further 15 percent stockpiled for use in the future. New Zealand only reuses 30 percent of its biosolids.

Not only is this waste clogging our landfills, the cost comparisons are also convincing, with landfill costs far exceeding the costs of applying treated biowaste to land. There are added benefits in reducing the costs of fertilisers, while improving soil quality.

The CIBR is set to play a critical role in moving New Zealand to a more sustainable way of managing biowaste. With specialists in environmental microbiology and toxicology, forest ecology, soil science, molecular biology, social sciences, soil chemistry and biochemistry, and Māori issues-based research, the CIBR has the skills it needs. It also has strong connections with universities, industry and local authorities and has an engaging approach that educates and empowers communities.

“Having easy access to an organisation with such a depth and broad range of knowledge means we can get answers and information quickly, saving us valuable time. That time can make a big difference when we’re dealing with a disease outbreak.

“This was demonstrated perfectly this year by a *Campylobacter* outbreak in Darfield. The strain was not one usually found from food sources. We worked with ESR to trace back a potential source. This information will help us in future investigations. It has also provided information to the water supplier for planning upgrades as well as convincing the communities of the need to upgrade.

“ESR is the important link between scientific knowledge and practical solutions so our communities can have healthy drinking water and freedom from disease.”

Judy Williamson, Health Protection Officer/Drinking Water Assessor,
Canterbury District Health Board, Drinking Water Assessors National Coordinator



Jan Gregor

THINK BEFORE YOU DRINK

For water scientist Jan Gregor the New Zealand water supply does not offer the challenges she enjoys in the Pacific Islands. “New Zealand has such a good water infrastructure that our work takes it to higher levels of quality assurance,” says Jan. “With the Pacific Islands, there is the opportunity to address issues that have a huge impact at an economic level as well as a health level in a developing nation.

“There is a significant impact of this work for New Zealand as well. With the volume of tourism and immigration from the Pacific, if we address health issues in the region we help protect New Zealand from disease coming in.”

One of the important aspects of Jan’s work is getting the message about water quality out to donor organisations like the United Nations and the Asia Development Bank. Pacific nations are dependent on them to fund infrastructure projects. “These donors know a lot about the need to reduce disease, but we can add a lot of extra value with our approach of empowering governments, communities and businesses to own their own risk management approach.”

The water supply risk management approach is one that ESR developed for New Zealand. Jan had to adapt the approach for small communities. “They need very practical advice about things like cleaning tanks and fencing stock.”

Jan’s work is funded by the New Zealand Aid Programme as well as major users such as the New Caledonian Department of Health, where the work has focussed on increasing the skills of department staff. Jan says New Caledonia has a sound programme of work to ensure safe drinking water. In the last year Jan has made a dozen trips into the Pacific. Her work means she knows where it’s safe to drink the water and where to be more cautious. “Things take time and money, but we’re making good progress.”

*Centre for Integrated Biowaste Research (CIBR)

Human resources

The work we do is critical to New Zealand and could not be achieved without a talented and stable workforce. We are proud of our reputation as a good employer and are always looking for development opportunities for our staff.

WORKFORCE PROFILE

Our workforce is balanced, diverse and stable. Women are well represented at all levels in our organisation. Eighty percent of our employees are engaged in science or science support roles; of this, 66 percent are women. Our age profile supports succession and workforce planning with 42 percent of our employees under the age of 41; seven percent are over 61. We have a stable workforce with turnover at 8.6 percent for the year ending 30 June 2013, down from the previous year.

LEADERSHIP AND ACCOUNTABILITY

As well as ensuring that all employees are treated properly and fairly, our leadership team involves employees in decision-making whenever possible. We're working with our senior scientists to help them achieve as leaders. This year we developed and implemented employee performance assessments that align with our goals.

Building a high-performance culture is one of our priorities. To achieve this we recognise the importance of demonstrating leadership and accountability in all areas of the employment relationship, including a commitment to equal employment opportunities (EEO).

RECRUITMENT, SELECTION AND INDUCTION

We have a sound and inclusive approach to recruitment and selection. Our tools to support selection decision-making include behavioural and skills-based assessments through the interview process; psychometric assessment where appropriate; and detailed reference checking.

EMPLOYEE DEVELOPMENT, PROMOTION AND EXIT

Our future success depends on growing our capabilities in a range of scientific areas. To help achieve this, our people attend international and national science conferences. We have strong relationships with universities, other CRIs and science organisations – working on projects together and providing a career path for graduates.

We provide a range of developmental support and we try to find opportunities for our people to experience new positions and roles.

Our approach to workforce planning and talent management emphasises diversity, as this is what will help us deliver our strategic direction. Building our overall leadership and management capability is another priority.

FLEXIBILITY AND WORK DESIGN

We actively support flexible working arrangements with our flexible hours, extended flexitime and other flexible working arrangement policies, which are promoted in the Employee Handbook. We support parents returning to work by offering part-time and gradual return to full-time work arrangements. Nineteen percent of our employees work part-time.

REMUNERATION, RECOGNITION AND CONDITIONS

Our terms and conditions of employment reflect our good employer philosophy, with a range of benefits valued by our employees. We have begun work on a new approach to remuneration and rewards to even more fairly and equitably reward people on the basis of performance, regardless of gender, age and ethnicity.

HARASSMENT AND BULLYING PREVENTION

Our Acceptable Behaviour Policy, put in place in 2007, sets out the standards of behaviour expected of all our people. New employees are introduced to this policy and given training as part of their induction.

HEALTH AND SAFETY

All our employees are given comprehensive training, guidelines, mentoring and supervision to ensure everyone's safety, health and wellbeing at work. We have a strong health and safety culture. Employees and the PSA (New Zealand Public Service Association) provide regular input through site health and safety committees.

We are proud to have kept our tertiary status in the ACC Work Safety Management programme, reflecting our commitment to a culture of continuous improvement.



66%
OF STAFF ARE
WOMEN



8.6%
WORKFORCE
TURNOVER



80%
OF STAFF ENGAGED
IN SCIENCE



390
FTE STAFF ACROSS
FOUR SITES



<1
HEALTH AND SAFETY
INCIDENTS PER
100 FTES



3
STAFF RECOGNISED
WITH EXCELLENCE
AWARDS



Sophie Walker

KEEPING PHDs IN NEW ZEALAND

Scientist Sophie Walker's parents were happy when she got her job at ESR. She says they hadn't expected her to return to New Zealand. Sophie works in ESR's National Radiation Laboratory (NRL) based in Christchurch.

Sophie says she would encourage young people with PhDs to consider joining ESR as it pushes forward with its science strategy. "There are an increasing number of young people working for NRL and there will be more opportunities as ESR's research expands into new areas," she says.

Sophie joined ESR in 2012 after she completed a PhD in cellular and molecular biology at the University of Canterbury and then post-doctoral studies at MIT (Massachusetts Institute of Technology). "Both my parents are scientists. It turns out I was destined to become one too."

"I'm glad I joined ESR. I've had opportunities to travel and to take on responsibilities I didn't expect to have at this stage of my career."

One of these opportunities was to be appointed as New Zealand national coordinator for an International Atomic Energy Agency (IAEA) funded project. "The best thing about working at ESR is the diversity of my role and the ability to work internationally. Recently I represented New Zealand at a meeting on food irradiation, held in Shanghai."

Sophie's time is divided between her role in the Radiation Protection Team and as one of NRL's science coordinators. "As well as supporting the Ministry of Health's regulatory role, the Radiation Protection Team is also involved in emergency response and the provision of training to institutions such as the New Zealand Fire Service and the Defence Force. We cover topics such as basic radiation physics, sources of radiation, the uses of medical and non-medical radiation, safety plans and the use of protective equipment."

ESR provides an enriching environment for young scientists like Sophie. Their work is significant and varied, and they receive a high level of support and development.

Non-financial performance measures

HEALTH NON-FINANCIAL PERFORMANCE MEASURES

Outcomes	Impact	Impact examples	Quality output examples
Safeguard the health of New Zealanders through improvements in the management of human biosecurity and threats to public health.	Early detection of public health hazards and disease outbreaks through the more accurate and timely identification of infectious disease events, leading to reduced incidences and impacts.	Monitoring for incidences of 50 notifiable and non notifiable diseases such as sexually transmitted infections (STIs) and influenza and other respiratory viruses.	Routine surveillance and outbreak reports delivered for the Ministry of Health (MoH) and Public Health Units (PHUs). Maintained the Early Aberration Reporting System (EARS) as an alerting service to PHUs and the MoH.
		H7N9.	Development of National Influenza Centre testing capability for H7N9 and support for diagnostic laboratories.
		Middle East respiratory syndrome coronavirus (MERS CoV).	Development of reference laboratory tests for MERS CoV.
	Effective interventions are applied by public health organisations to manage the risk and incidence of public health hazards and diseases, including effective placement of vaccines.	Responses to enteric disease outbreaks.	Coordinated multi-jurisdictional outbreaks investigations alongside other agencies.
		H7N9 preparedness.	Circulation of epidemiological summaries and advice.
		MERs CoV.	Circulation of reference material and summaries to key contacts through Public Health AIDE.
		Southern Hemisphere Influenza Vaccine Effectiveness Research and Surveillance (SHIVERS) project.	Epidemiological analysis and intelligence to support policy making and review of the international case definition for Severe Acute Respiratory Illness.
		Coordination of skill development programmes.	Trained 73 PHU staff in various aspects of applied infectious disease epidemiology and outbreak investigation.
	Safer working environment for users and medical recipients of radiation sources.	Responding to client feedback indicating a need for new training courses.	Workplace related radiation safety training courses developed in response to client needs.

FOOD NON-FINANCIAL PERFORMANCE MEASURES

Outcomes	Impact	Impact examples	Quality output examples
<p>Enhance protection of New Zealand's food-based economy through the management of food safety risks associated with traded goods.</p>	Prompt diagnosis of foodborne microbial and chemical hazards.	Turnaround times for sample investigations (also an output measure of the timeliness of sample analysis).	5433 food and related clinical or environmental samples examined with complex microbiological and/or chemical analyses. Results reported within 7 days for 58% of samples analysed and within 30 days for 35%.
	Prevention of illness caused by consumption of contaminated food.	Analysis time of foods destined for domestic consumption.	Three lots of norovirus-contaminated imported oysters prevented from sale to NZ consumers.
	Effective responses to food safety issues.	Extent to which client agencies adopt effective interventions based on advice and research received from ESR.	ESR supported Ministry for Primary Industries (MPI) with a quantitative assessment of risks associated with raw milk consumption, initiated after a request by the Minister of Food Safety to MPI in December 2012. Expert opinion on two FSANZ assessments of genetically modified foods provided at the request and satisfaction of MPI.
	Maintaining and improving the integrity of New Zealand's food production systems.	Industry perceptions of system integrity based on formal feedback from key industry players. Number of consignments (that were tested by ESR) stopped at overseas docks due to detection of <i>E. coli</i> .	Three media companies commissioned analysis of processed meat products in reaction to the European scandal in which undeclared horse meat was detected in ready-to-eat meat products sold across Europe. Horse meat was not detected in any of the foods examined from NZ supermarkets. Results were widely disseminated by TV3 and <i>The New Zealand Herald</i> . All consignments of beef tested by ESR before export to the United States met that country's food safety standards (i.e. no shipments were returned or recalled).

WATER PROGRAMME NON-FINANCIAL PERFORMANCE MEASURES

Outcomes	Impact	Impact examples	Quality output examples
Improve the safety of freshwater and groundwater resources for human use and the safe use of biowastes.	Resource management decisions are well informed by the human health impacts relating to freshwater use.	Enteric virus contamination of freshwater is actively considered by many regional councils during resource consenting process and regional planning, eg Auckland Regional Council.	<p>Appeared as expert witness twice at resource consent hearings.</p> <p>Feedback from a commissioner that the cyanobacteria evidence provided during a resource consent hearing was very beneficial.</p>
	Improved water management practice from the perspective of public health impacts.	Seven regional councils actively use wastewater-drinking-water well separation distances guide produced by ESR.	<p>Register of community drinking water supplies is updated online weekly.</p> <p>Drinking water supplier details held on WINZ is used annually to compile the <i>legislatively-required Annual Report on Drinking-water Quality in New Zealand</i> and the <i>Register of Community Drinking-water Supplies</i>.</p> <p>Gave advice on wastewater contamination of drinking water in response to gastroenteritis outbreaks at Darfield and Cardrona ski field, including advice on sampling.</p> <p>Gave advice on cyanobacterial contamination during the drought in Wellington.</p>
	Improved stakeholder understanding of contaminant pathways in water systems and biowastes.	<p>Matata wastewater public health risk assessment report influenced council decision.</p> <p>Biowaste research used by Kaikoura and Mokai communities.</p>	<p>Gave advice to Ministry of Health and district health boards following Mt Tongariro eruption on contaminant leaching from volcanic ash and safe rainwater harvesting.</p> <p>The assessment of groundwater assimilative capacity research programme and the clean water productive plan was rated by an independent review panel as 4.33 out of 5.</p>
	Effective policy, regulation, standards and monitoring in New Zealand and the Pacific.	<p>Survey of heavy metals in imported tattoo inks informs Ministry of Health border control decisions.</p> <p>Microbiological quality testing and public health risk assessment for drinking water from rainwater has recommenced in Tonga.</p>	<p>Provided regular training to health protection officers and drinking water assessors.</p> <p>ANZS for monitoring methods for air quality reviewed and updated, including advice from ESR.</p> <p>Advice on public health concerns relating to release of new species of dung beetle.</p>

FORENSICS NON-FINANCIAL PERFORMANCE MEASURES

Outcomes	Impact	Impact examples	Quality output examples
Increase effectiveness of forensic science services applied to safety, security and justice investigations and processes.	Faster, definitive identification of individuals.	The DNA Databank operates as a highly functional intelligence tool where timeliness, success rates and quality are paramount.	2,200 links made from crime samples to profiles on the DNA Databank. 71% of all crimes compared against the DNA Databank linked to individuals. Expert testimony in criminal proceedings on an almost weekly basis.
	Faster, more effective examinations of crime scenes through the use of new technologies.	Crime scene investigations enhanced by new visual imaging tools.	3D laser scanning of scenes introduced in forensic casework in July 2012 for uptake by NZ Police. This tool significantly enhances the capture of information at scenes to generate 3D scene models, accurate recording of bullet path trajectories and improved blood stain pattern analysis.
		Rapid DNA analysis tools may reduce the time needed to process crime scene samples.	Rapid DNA devices trialled by ESR can obtain DNA profiles in less than two hours and can be deployed at the crime scene, allowing significantly faster DNA identification.
		Faster transmission of information from crime scenes to speed up investigations.	ESR trialled "remote collaboration" devices to be used at crime scenes to measure the reliability of real time transmission of video, audio and static images to aid scene investigations.
	More robust forensic evidence.	Improved outcomes for cases involving complex DNA results that were previously unable to be resolved.	The use of ESR's STRmix, implemented on 24 August 2012, resulted in more useable DNA profiling outputs and improved case turnaround times.
		Application of new science to historic crimes.	New technology is being used on cold cases to provide investigative leads to the NZ Police.
	More efficient and effective delivery of evidence at trial.	Enhanced presentation of forensic evidence in the court room via a new <i>Integrated Evidence Platform</i> .	Forensic evidence delivered electronically in six High Court trials, through the <i>Integrated Evidence Platform</i> .

CROSS-CUTTING NON-FINANCIAL PERFORMANCE MEASURES

Focus	Measures	Results
End-user collaboration Develop strong, long-term partnerships with industry, government and Māori, and work with them to set research priorities that are well linked to the needs and potential of their end-users.	Percentage and number of relevant funding partners and other end users that have a high level of confidence in ESR's ability to set research priorities, and the effectiveness of the collaborations and partnerships (survey data). Annually.	65% of ESR stakeholders have a high level of confidence that ESR understands their research priorities.
	Total dollar value of revenue (in cash and in kind) and dollar value subcontracted to other organisations from each "source category" per annum from rolling five years (administrative data).	See table below.
		12 month period to
		30 June 2013 30 June 2012 30 June 2011 30 June 2010 30 June 2009
	Source category	\$000s \$000s \$000s \$000 \$000s
	CRI	1,222 2,082 1,362 1,260 575
	Non-CRI govt	96 98 – – –
	TEO	1,064 335 1,074 449 463
	Private NZ business	186 144 162 97 45
	Overseas	2 12 19 23 –
Other	– 23 0 71 80	
Total	2,570 2,694 2,617 1,900 1,163	
Research collaboration Develop collaborative relationships with other CRIs, universities and other research institutions within New Zealand and internationally to form the best teams to deliver ESR's core purpose.	Percentage of relevant national and international research providers that have a high level of confidence in ESR's ability to form the best teams to deliver on ESR's outcomes (annual survey data).	79% of ESR stakeholders are highly satisfied with their collaboration and partnerships with ESR.
	Number and percentage of joint scientific peer reviewed publications and intellectual property (IP) outputs with other New Zealand and international research institutions per annum (administrative data).	Number and percentage of joint scientific peer reviewed publications: There are 132 peer reviewed scientific outputs, of which 108 are published or accepted for publication in some form. 78 of these were jointly authored, which is 59%.
	Number of research collaborations with CRIs, universities and international organisations.	94 research collaborations.
	Number of joint research projects.	111 joint research projects undertaken.
	New revenue from expanded international collaborations (particularly Australia, Europe and the United States).	Europe \$272,962.00 United States \$2,067,834.00 Australia \$85,380.00 Other \$20,183.00 Total new revenue from international collaborations \$2,446,359.00

CROSS-CUTTING NON-FINANCIAL PERFORMANCE MEASURES (continued)

Focus	Measures	Results
Technology and knowledge transfer (science relevance) Transfer technology and knowledge from domestic and international sources to New Zealand industry, government and Māori.	Total number and percentage of licensing deals of ESR-derived IP (including technologies, products and services) with New Zealand and international partners per annum (administrative data).	Total number and percentage of licensing deals of ESR-derived IP: 0.
	Percentage of relevant end users who have adopted knowledge and/or technology from ESR (annual survey data).	100% (n=27) of surveyed end users had adopted knowledge and/or technology from ESR.
	Percentage change in the number of requests for and enquiries about ESR's publicly available collections (administrative data).	1,696 cultures were supplied, a 9% drop over FY 2012
	Number of training programmes delivered, number of officers trained.	Number of training programmes delivered by ESR as follows: 17 consultancies, involving 298 participants 49 training sessions, involving 1,615 participants In total, ESR ran 66 training events with 1,913 participants.
Science quality Pursue excellence in all ESR's activities.	Total number of international awards, invitations to participate on international committees, and editorial boards for ESR's published papers per annum.	International awards, invitations to participate on international committees, etc: <ul style="list-style-type: none"> • 36 committees • 5 international awards • Total 41
	Average number of citations per ESR published paper.	Average number of citations per ESR published paper as indicated by academic databases. Using Scopus without self-citation – 6.75 Using Scopus with self-citation – 8.44 Using Web of Science with self-citation – 11.24
	Proportion of published papers in the top 25 journals of international quality relevant to the scope of ESR per annum.	30 papers published in top 25 journals of international quality (31% of all ESR articles published).

CORE FUNDING PROJECTS

The proportion of projects allocated to short term (one year), medium term (two years) and long term (three or more years) was 39:48:13. We invested \$4.5 million in the 2012/13 financial year over a total of 23 projects in our four outcome areas as outlined in our Statement of Core Purpose.

Examples of projects that demonstrate our science capabilities and value to the sectors we serve include identifying a potential biocontrol agent for an invasive species with potential application for the Ministry for Primary Industries (MPI); and a project that is the first reported aerosol detection of veterinary pathogens in an occupational setting. Core funded research also resulted in operational diagnostic testing for mutations in cancer genes within a medical setting. We will receive royalties for this testing. Some of the food programme research on estimating the global burden of foodborne disease has been applied internationally.

OUTCOME 1: SAFEGUARD THE HEALTH OF NEW ZEALANDERS THROUGH IMPROVEMENTS IN THE MANAGEMENT OF HUMAN BIOSECURITY AND THREATS TO PUBLIC HEALTH

Project	Description	Achievement
Host immunity to meningococcus	Identify key bacterial, epithelial and immune system factors that may govern how the host reacts to <i>Neisseria meningitidis</i> infections.	Comparison of closely related <i>Neisseria</i> isolates from the members of the same household found phenotypic and genetic differences between isolates. This has potential impact on vaccine design and surveillance programmes both domestically and internationally.
Biomarkers of human disease: towards developing tests of clinical utility	Develop diagnostic and prognostic tests and bring them to service.	Implemented cancer mutation tests in conjunction with Capital and Coast District Health Board (CCDHB) Molecular Diagnostics Unit. Resultant BRAF V600 test brought to service and is fully operational with CCDHB.

OUTCOME 2: INCREASE THE EFFECTIVENESS OF FORENSIC SCIENCE SERVICES APPLIED TO SAFETY, SECURITY AND JUSTICE INVESTIGATIONS AND PROCESSES

Project	Description	Achievement
Future Crime Scene	Evaluation of new technologies for use at crime scenes in three key areas: 1) recording and showing the crime scene using new scanning technologies, 2) transmitting information from the crime scene in real time, and 3) using new devices for field testing at the crime scene.	Debut of 3D "virtual tour" software that revolutionises crime scene investigations. Development of mobile crime scene tools such as DNA testing laboratories for immediate analysis and databank searches, and remote aerial vehicles with thermal imaging cameras to map scenes and identify bodies, debris or weapons.
Forensic science for Customs	Implementation of a drug signature programme (DSP) and development of a prototype drug intelligence portal for collation of ESR drug data and its dissemination to NDIB, NZ Customs and Police.	Enhanced on-site capabilities that speed up the process of identifying what's legal and what's not. Trial prototype of Drug Intelligence Portal.

OUTCOME 3: ENHANCE PROTECTION OF NEW ZEALAND'S FOOD-BASED ECONOMY THROUGH THE MANAGEMENT OF FOOD SAFETY RISKS ASSOCIATED WITH TRADED GOODS

Project	Description	Achievement
Multiplex Ligation-dependent Probe Amplification (MLPA) foodborne pathogens	Improve the safety and quality of food in New Zealand, and assure market access for exported foods by providing high-quality, critical scientific advice and services.	Improved diagnosis of notified diseases in New Zealand, particularly those caused by <i>Campylobacter</i> and Shiga toxin-producing <i>Escherichia coli</i> (STEC). Development of a MLPA-based typing scheme (MBit) for <i>C. jejuni</i> and <i>C. coli</i> with international researchers. Cell and DNA storage methods, a website and a prototype database have been developed to complement the MBit assay.
New tools, new services from quantitative risk assessment	Develop ESR's quantitative risk modelling capability as an enhanced service for new and existing government and industry clients.	Supported cost-effectiveness analysis of control of <i>Campylobacter</i> in the New Zealand poultry meat food supply through the use of quantitative risk models. Expanded research and risk assessment on tikanga Māori related to shellfish consumption.

OUTCOME 4: IMPROVE THE SAFETY OF FRESHWATER AND GROUNDWATER RESOURCES FOR HUMAN USE AND THE SAFER USE OF BIOWASTES

Project	Description	Achievement
Groundwater targets for regional councils	Develop methodologies to enable a range of groundwater targets, proposed by regional councils, to be examined and the required steps to achieve those targets identified.	Model to assess effects on land use and denitrification on N loadings being used by Environment Canterbury. Vadose zone experiment and additional work on <i>E. coli</i> in groundwater has been requested.
Developing new paradigms for microbial water quality management	Develop a commercially applicable strategy for the direct evaluations of <i>Campylobacter</i> genotypes in water for both source attribution and risk assessments.	Implemented a new miniaturised method for enumerating <i>Campylobacter</i> from water samples and applied MLPA genotyping methodology to isolates from water for use by regional councils, water authorities and central government.

Key financial performance measures

	Year ended 30 June 2013	Target	Year ended 30 June 2012
Revenue, \$M	62.1	64.6	58.6
Operating margin, %	11.7	12.5	13.0
Return (NPAT*) on equity, %	3.3	2.8	6.5
Return (EBIT) on assets, %	2.9	3.0	4.6
Acid test, ratio	1.4	1.4	1.5
Equity ratio	66.4	71.1	65.2
Gearing	1.4	–	1.2
Interest cover	–	–	–
Annualised operating margin per FTE, \$'000s (including casual staff)	19.0	19.7	20.6

* Net profit (surplus) after taxation

STATEMENT OF RESPONSIBILITY

We certify that the Company has operated in accordance with the principles of the Crown Research Institutes Act 1992 and Companies Act 1993. The Company has also complied with all statutory environmental obligations.

We acknowledge responsibility for the preparation of these financial statements and for the judgements used therein.

Internal control procedures are considered to be sufficient to provide a reasonable assurance as to the integrity and reliability of the financial reports.

In our opinion these financial statements fairly reflect the financial position and operations of the Institute of Environmental Science and Research Limited (ESR) for the year ended 30 June 2013.



Dr Susan Macken

Chair



Tahu Potiki

Director

Report of the directors

The directors present the Annual Report and audited financial statements of the Institute of Environmental Science and Research (ESR) for the year ended 30 June 2013.

The Auditor-General is the statutory auditor pursuant to section 21 of the Crown Research Institutes Act 1992. The Auditor-General has appointed PricewaterhouseCoopers to audit the financial statements and to express an opinion on them. Their report is on page 26 and 27.

Chris Barber has indicated his willingness to continue in the office as auditor on behalf of the Controller and Auditor-General. Details of the auditor's remuneration and expenses are disclosed in note 2 to the financial statements.

PRINCIPAL ACTIVITY

ESR is a Crown research institute that provides specialist scientific services and research, particularly to the health and justice sectors. Its 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 and contribute to the economic, environmental and social wellbeing of people and communities in New Zealand.

DIVIDENDS

No dividends have been declared or paid in respect of the 2013 financial year.

DIRECTORS' INDEMNITY

ESR has arranged for directors and officers insurance for any act or omission in their capacity as a director of the Company.

DIRECTORS' USE OF INFORMATION

No member of the Board of ESR, or any subsidiary, issued a notice requesting to use information received in their capacity as directors that would not otherwise have been available to them.

DONATIONS

No donations were made during the year.

BOARD COMPOSITION

Dr Judith Johnston retired from the Board on 30 June 2013. Dr Helen Darling was appointed to the Board on 1 July 2013.

REMUNERATION OF DIRECTORS

The directors who held office in the period of this report and their total remuneration and other benefits were as follows:

Dr Susan Macken	\$46,000
Ross Peat	\$28,750
Tahu Leslie Potiki	\$23,000
Professor Bill Denny	\$23,000
Dr Judith Johnston	\$23,000
Patricia Schnauer	\$23,000
Marion Cowden	\$23,000
	<hr/>
	\$189,750

DISCLOSURE OF INTERESTS BY DIRECTORS

As at 30 June 2013 the following directors had made the following general disclosures:

Dr Susan Macken (Chair)

Director, Tamaki Redevelopment Company
Independent Non-executive Director, Bank of New Zealand
Director, Fertility Associates
Managing Director, STG Ltd
Director, Blossom Bear Ltd
Non-executive Director, Treasury
Director, Ultimate Care Group

Ross Peat (Deputy Chair)

Director, Healthsoft Ltd
Director, Healthsoft Australia Ltd
Director, Kinopta Ltd
Director, YuVu Ltd
Director, KlickEx Trading Ltd
Director, KlickEx Pacific Ltd
Director, KlickEx Corporation Ltd
Member, University of Otago Business School Advisory Board
Trustee, Hi Tech Trust

Dr Judith Johnston

Director, Petone Medical Centre Ltd
Shareholder, Judith Johnston Limited
Clients of Judith Johnston Ltd:
Ministry of Education
Maritime New Zealand
State Services Commission
IRD Risk & Assurance Committee
PCO Risk & Audit Committee
Department of Internal Affairs
Commissioner, Tertiary Education Commission

Marion Cowden

Deputy Chair, Energy Efficiency and Conservation Authority (EECA)
Board Member, St John of God Hauora Trust
National Council Member, Student Job Search Aotearoa
Chair, Independent Expert Oversight Advisory Committee, World Health Organization (WHO)
Trustee, Neonatal Trust (New Zealand) Inc
Chair, Quail Ridge Country Club Ltd
Member, Audit and Risk Committee, Ministry for the Environment (MfE)
Chair, Daya Trust
Chair, Age Concern (Wellington)

Tahu Leslie Potiki

Director, Ngāi Tahu Tourism Ltd
Board Member, Southern District Health Board
Director, Māori Television Service
Elected Representative, Te Rūnanga o Ngāi Tahu
Trustee, Ngāi Tahu Charitable Trust
Director, Arataki Associates Ltd

Patricia Schnauer

Trustee, North Harbour Stadium Trust
Director, Millife Trustee Ltd
Director, Millaw Services Ltd

Professor Bill Denny

Director, Auckland Cancer Society Research Centre, University of Auckland
Head, Scientific Advisory Committee, Australian Cancer Research Foundation Drug Discovery Centre, Sydney
Member, Scientific Advisory Group, Australian Cooperative Research Centre for Cancer Therapeutics, Melbourne
Member, Ministry of Health/Health Research Council Steering Committee for Cancer Research Partnership
Member, Management Group, Maurice Wilkins Centre for Molecular Bioscience, University of Auckland
Member, Senior Management Team, Cancer Society, Auckland
Shareholder, Proacta Inc, San Diego
Shareholder, Pathway Therapeutics Ltd, San Francisco
Member, National Science Challenge Panel

DIRECTORS' INTERESTS

No director held any interest in the shares of ESR. ESR has funding contracts with the Marsden Fund and the Ministry of Business, Innovation and Employment, which are negotiated at arm's length with appropriate directors' interests being declared. Except for these contracts no material contracts involving directors' interests were entered into during, or subsequent to, the period covered by this report.

REMUNERATION

Total remuneration in respect of employees paid above \$100,000 was as follows:

Remuneration range	No. of staff
\$100,000 – \$109,999	11
\$110,000 – \$119,999	12
\$120,000 – \$129,999	2
\$130,000 – \$139,999	6
\$140,000 – \$149,999	2
\$150,000 – \$159,999	1
\$180,000 – \$189,999	1
\$200,000 – \$209,999	2
\$210,000 – \$219,999	2
\$250,000 – \$259,999	1
\$350,000 – \$359,999	1

EVENTS SUBSEQUENT TO BALANCE DATE

The directors are not aware of any matter or circumstance since the end of the financial year that has significantly affected, or may significantly affect, the operation of ESR.



Dr Susan Macken
Chair



Tahu Potiki
Director

Independent auditor's report

TO THE READERS OF THE INSTITUTE OF ENVIRONMENTAL SCIENCE AND RESEARCH LIMITED'S FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2013

The Auditor-General is the auditor of the Institute of Environmental Science and Research Limited (the 'Institute') and the Group, comprising the Institute and its dormant subsidiaries. The Auditor-General has appointed me, Chris Barber, using the staff and resources of PricewaterhouseCoopers, to carry out an audit of the financial statements of the Institute and Group on her behalf.

We have audited the financial statements of the Institute and Group on pages 28 to 52, that comprise the statement of financial position as at 30 June 2013, the statement of profit or loss and other comprehensive income, statement of changes in equity and statement of cash flows for the year ended on that date; and a summary of significant accounting policies and other explanatory information.

OPINION ON THE FINANCIAL STATEMENTS

In our opinion, the financial statements of the Institute and Group on pages 28 to 52:

- comply with generally accepted accounting practice in New Zealand;
- comply with International Financial Reporting Standards; and
- give a true and fair view of the Institute and Group's:
 - financial position as at 30 June 2013; and
 - financial performance and cash flows for the year ended on that date.

OPINION ON OTHER LEGAL REQUIREMENTS

In accordance with the Financial Reporting Act 1993 we report that, in our opinion, proper accounting records have been kept by the Institute and Group as far as appears from an examination of those records.

Our audit was completed on 13 August 2013. This is the date at which our opinion is expressed.

The basis of our opinion is explained below. In addition, we outline the responsibilities of the Board of Directors and our responsibilities, and we explain our independence.

BASIS OF OPINION

We carried out our audit in accordance with the Auditor-General's Auditing Standards, which incorporate the International Standards on Auditing (New Zealand). Those standards require that we comply with ethical requirements and plan and carry out our audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

Material misstatements are differences or omissions of amounts and disclosures that in our judgement, are likely to influence readers' overall understanding of the financial statements. If we had found material misstatements that were not corrected, we would have referred to them in our opinion.

An audit involves carrying out procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on our judgement, including our assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments we consider internal control relevant to the entity's preparation of the financial statements that fairly reflect the matters to which they relate. We consider internal control in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.

An audit also involves evaluating:

- the appropriateness of accounting policies used and whether they have been consistently applied;
- the reasonableness of the significant accounting estimates and judgements made by the Board of Directors;
- the adequacy of all disclosures in the financial statements; and
- the overall presentation of the financial statements.

We did not examine every transaction, nor do we guarantee complete accuracy of the financial statements. Also we did not evaluate the security and controls over the electronic publication of the financial statements.

In accordance with the Financial Reporting Act 1993 we report that we have obtained all the information and explanations we have required. We believe we have obtained sufficient and appropriate audit evidence to provide a basis for our audit opinion.

RESPONSIBILITIES OF THE BOARD OF DIRECTORS

The Board of Directors is responsible for preparing financial statements that:

- comply with generally accepted accounting practice in New Zealand; and
- give a true and fair view of the Institute and Group's financial position, financial performance and cash flows.

The Board of Directors is also responsible for such internal control as it determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error. The Board of Directors is also responsible for the publication of financial statements, whether in printed or electronic form.

The Board of Directors' responsibilities arise from the Crown Research Institutes Act 1992 and the Financial Reporting Act 1993.

RESPONSIBILITIES OF THE AUDITOR

We are responsible for expressing an independent opinion on the financial statements and reporting that opinion to you based on our audit. Our responsibility arises from section 15 of the Public Audit Act 2001 and the Crown Research Institutes Act 1992.

INDEPENDENCE

When carrying out the audit, we followed the independence requirements of the Auditor-General, which incorporate the independence requirements of the External Reporting Board.

In addition to the audit, we have carried out assignments in the area of taxation compliance which are compatible with those independence requirements. Other than the audit and these assignments, we have no relationship with, or interests in, the Institute or any of its subsidiaries.



Chris Barber
On behalf of the Auditor-General
Wellington, New Zealand



PricewaterhouseCoopers

Matters relating to the electronic presentation of the audited financial statements

This audit report relates to the financial statements of the Company for the year ended 30 June 2013 included on the Company's website. The Company's Board of Directors is responsible for the maintenance and integrity of the Company's website. We have not been engaged to report on the integrity of the Company's website. We accept no responsibility for any changes that may have occurred to the financial statements since they were initially presented on the website.

The audit report refers only to the financial statements named above. It does not provide an opinion on any other information which may have been hyperlinked to or from the financial statements. If readers of this report are concerned with the inherent risks arising from electronic data communication they should refer to the published hard copy of the audited financial statements and the related audit report dated 30 August 2013 to confirm the information included in the audited financial statements presented on this website. Legislation in New Zealand governing the preparation and dissemination of financial information may differ from legislation in other jurisdictions.

Statement of profit or loss and other comprehensive income

FOR THE YEAR ENDED 30 JUNE 2013

	Note	Group actual year ended 30 June 2013 audited \$'000s	Group budget year ended 30 June 2013 unaudited \$'000s	Group actual year ended 30 June 2012 audited \$'000s
OPERATING REVENUE				
Revenue from rendering of services		53,892	56,672	51,071
Core funding		8,222	7,909	7,479
		62,114	64,581	58,550
OPERATING EXPENSES				
Scientific materials		(6,204)	(6,970)	(6,395)
Subcontracting expense		(6,065)	(6,372)	(5,016)
Employee benefit expense		(31,128)	(31,621)	(28,104)
Depreciation and amortisation expense	4/5	(5,598)	(6,317)	(4,993)
Other expenses	2	(11,435)	(11,858)	(11,429)
		(60,430)	(63,138)	(55,937)
OPERATING PROFIT				
		1,684	1,443	2,613
Finance income – interest income		166	162	271
Finance expense		(27)	(19)	(11)
NET FINANCE INCOME / (EXPENSE)		139	143	260
PROFIT BEFORE INCOME TAX EXPENSE				
		1,823	1,586	2,873
Income tax expense	3	(561)	(495)	(1,077)
Income tax expense due to change in tax legislation	3	–	–	580
PROFIT FOR THE PERIOD ATTRIBUTABLE TO THE INSTITUTE'S SHAREHOLDER				
		1,262	1,091	2,376
Other comprehensive income		–	–	–
TOTAL PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME FOR THE PERIOD ATTRIBUTABLE TO THE INSTITUTE'S SHAREHOLDER				
		1,262	1,091	2,376

The accompanying notes form an integral part of these financial statements.

Statement of changes in equity

FOR THE YEAR ENDED 30 JUNE 2013

	Group actual audited Share capital \$'000s	Group actual audited Retained earnings \$'000s	Group actual audited Total \$'000s
BALANCE AT 1 JULY 2011	8,494	26,986	35,480
Profit for the period	–	2,376	2,376
Other comprehensive income	–	–	–
TOTAL COMPREHENSIVE INCOME	–	2,376	2,376
TRANSACTIONS WITH OWNERS:			
Dividend	–	–	–
BALANCE AT 30 JUNE 2012	8,494	29,362	37,856
BALANCE AT 1 JULY 2012	8,494	29,362	37,856
Profit for the period	–	1,262	1,262
Other comprehensive income	–	–	–
TOTAL COMPREHENSIVE INCOME	–	1,262	1,262
TRANSACTIONS WITH OWNERS:			
Dividend	–	–	–
BALANCE AT 30 JUNE 2013	8,494	30,624	39,118

The accompanying notes form an integral part of these financial statements.

Statement of financial position

AS AT 30 JUNE 2013

	Note	Group actual 30 June 2013 audited \$'000s	Group budget 30 June 2013 unaudited \$'000s	Group actual 30 June 2012 audited \$'000s
NON-CURRENT ASSETS				
Property, plant and equipment	4	33,911	31,587	31,070
Intangible assets	5/6	8,207	10,480	6,500
		42,118	42,067	37,570
CURRENT ASSETS				
Cash and cash equivalents		2,136	3,368	7,232
Trade and other receivables	8	11,855	7,930	12,956
Derivative financial instruments		–	–	84
Income tax receivable	12	20	–	–
Inventories – scientific materials and consumables		725	1,353	1,238
		14,736	12,651	21,510
CURRENT LIABILITIES				
Trade and other payables	9	9,843	7,656	13,347
Employee benefits	10	2,713	2,579	2,739
Finance lease liabilities	11	309	–	217
Derivative financial instruments		58	–	–
Income tax payable	12	–	298	325
		12,923	10,533	16,628
NET CURRENT ASSETS / (LIABILITIES)		1,813	2,118	4,882
NON-CURRENT LIABILITIES				
Employee benefits	10	1,138	–	1,098
Finance lease liabilities	11	237	–	243
Deferred taxation	7	3,438	5,166	3,255
		4,813	5,166	4,596
NET ASSETS		39,118	39,019	37,856
EQUITY				
Share capital	14	8,494	8,494	8,494
Retained earnings		30,624	30,525	29,362
Total equity		39,118	39,019	37,856

The Board of Directors of the Institute of Environmental Science and Research Limited authorised these financial statements for issue on 13 August 2013.

On behalf of the Board:



Dr Susan Macken

Chair

Dated 13 August 2013



Tahu Potiki

Director

The accompanying notes form an integral part of these financial statements.

Statement of cash flows

FOR THE YEAR ENDED 30 JUNE 2013

Note	Group actual year ended 30 June 2013 audited \$'000s	Group budget year ended 30 June 2013 unaudited \$'000s	Group actual year ended 30 June 2012 audited \$'000s
CASH FLOWS FROM / (USED IN) OPERATING ACTIVITIES			
<i>Cash was provided from:</i>			
Customers	59,154	61,254	57,599
Interest received	202	162	280
	59,356	61,416	57,879
<i>Cash was applied to:</i>			
Suppliers and employees	(53,352)	(54,075)	(49,453)
Interest paid	(25)	(19)	(11)
Income tax paid	(723)	(346)	(708)
12			
	(54,100)	(54,440)	(50,172)
NET CASH INFLOW FROM OPERATING ACTIVITIES	(5,256)	6,976	7,707
15			
CASH FLOWS FROM / (USED IN) INVESTING ACTIVITIES			
<i>Cash was provided from:</i>			
Proceeds from sale of property, plant and equipment	–	1	19
	–	1	19
<i>Cash was applied to:</i>			
Purchase of property, plant and equipment	(6,766)	(5,932)	(4,118)
Purchase of intangible assets	(3,010)	(2,568)	(1,701)
Acquisition of business	(204)	–	(2,000)
	(9,980)	(8,500)	(7,819)
NET CASH OUTFLOW FROM INVESTING ACTIVITIES	(9,980)	(8,499)	(7,800)
CASH FLOWS FROM / (USED IN) FINANCING ACTIVITIES			
<i>Cash was provided from / (applied to):</i>			
Dividends paid	–	–	–
Repayment of finance lease liabilities	(372)	(172)	(176)
NET CASH (OUTFLOW) / INFLOW FROM FINANCING ACTIVITIES	(372)	(172)	(176)
NET (DECREASE) / INCREASE IN CASH HELD	(5,096)	(1,695)	(269)
Cash and cash equivalents at the beginning of the period	7,232	5,063	7,501
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD	2,136	3,368	7,232
COMPRISING:			
– cash at bank	2	–	14
– short term deposits	2,134	3,368	7,218
TOTAL CASH AND CASH EQUIVALENTS	2,136	3,368	7,232

The accompanying notes form an integral part of these financial statements.

1. STATEMENT OF SIGNIFICANT ACCOUNTING POLICIES

Reporting entity

These financial statements of the Institute of Environmental Science and Research Limited and its subsidiaries ("ESR" and the "Group") are for the year ended 30 June 2013.

ESR is a Crown entity incorporated and based in New Zealand. Its registered office is 34 Kenepuru Drive, Porirua.

ESR is a Crown research institute that provides specialist scientific services and research, particularly to the health and justice sectors.

These financial statements have been approved for issue by the Board on 13 August 2013.

Basis of preparation

The financial statements are Parent (ESR) 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 (NZ GAAP). They comply with New Zealand equivalents to 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).

Adoption status of relevant new financial reporting standards and interpretations

The Group has elected not to early adopt any of the new standards and amendments to existing standards which have been issued as at 30 June 2013 but not yet effective. It is not anticipated that standards not yet effective will significantly impact the financial statements of the Group.

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 and 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 and Employee Benefits.

Revenue

The Group uses the stage of completion method in accounting for its fixed price contracts to deliver scientific services. The use of 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 as at 30 June 2013 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 date, 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 profit or loss and other comprehensive income.

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 location and condition necessary for their intended use.

The carrying amounts of plant, property 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 profit or loss and other comprehensive income.

Realised gains and losses arising from the disposal of property, plant and equipment are recognised in the statement of profit or loss and other 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 profit or loss and other comprehensive income on a straight-line basis over the useful life of the asset (between 3 and 10 years).

Customer contracts

The intangible asset "customer contracts", represents the fair value of future revenue streams from customer contracts acquired under business combinations. 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 life, 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 period of expected future sales from the related project 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 amount may not be recoverable. An impairment loss is recognised for the amount by which the 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 settle. 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 they 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 profit or loss and other 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 profit or loss and other 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 profit or loss and other comprehensive income over the period of the borrowing using the effective interest rate method.

Borrowings are classified as current liabilities unless ESR has an unconditional right to defer the 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 the 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 profit or loss and other comprehensive income when the requirements under the grant agreement have been met. Any grants for which the requirements have not been completed are carried as liabilities until all conditions have been fulfilled.

Interest income

Interest income is recognised in the statement of profit or loss and other comprehensive income on a time proportion basis, using the effective interest rate method.

Vaccine revenue

ESR purchases vaccines on behalf of the Pharmaceutical Management Agency (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.

Amounts due for vaccine purchases are disclosed in trade and other payables whilst amounts due to vaccine sales are disclosed in trade and other receivables.

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 currencies 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 profit or loss and other 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 and at fair value through profit and loss. 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-date – the date on which the Group commits to purchase or sell the asset. 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 and derivatives.

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.

2. OTHER EXPENSES INCLUDE THE FOLLOWING SPECIFIC ITEMS:

	Note	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Fees paid to PricewaterhouseCoopers for:			
– the audit of the statutory financial statements		103	95
Total audit related fees paid to the auditors		103	95
– non audit related services – taxation compliance		14	24
– non audit related services – taxation advisory		–	15
– non audit related services – accounting advice		–	15
– non audit related services – finance function review		–	27
TOTAL FEES PAID TO AUDITORS		117	176
Defined contribution plan expense		612	180
Directors' fees	18	190	190
Bad debts written off		15	9
Communications (including phone, network, postage and courier)		846	822
IT systems maintenance and licence costs		1,537	1,110
Consultancy fees		1,393	1,712
Impairment of receivables (loans and advances)		57	–
Impairment of intangible assets		–	88
Foreign exchange losses		12	34
Fair value loss / (gain) on forward exchange contract		58	(84)
Loss on sale of fixed assets		–	20
Marketing and advertising		190	167
Office and administration		1,350	1,237
Occupancy		2,130	2,132
Rental and operating lease costs		659	824
Training and conferences		264	244
Travel (airfares and accommodation)		1,562	1,488
Restructuring expense		115	–
Business acquisition costs		–	88

Given the nature of ESR's principal business activities, research comprises part of ESR's everyday business operations. As such, expenses relating to research are not separately identified. The cost of research to ESR is distributed between the relevant expense items, for example employee benefits and scientific materials used.

Fees paid to auditors for taxation advisory work relate to advice on the interpretation and application of tax legislation and guidance.

3. TAXATION

	Note	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
The taxation charge has been calculated as follows:			
PROFIT BEFORE INCOME TAX EXPENSE		1,823	2,873
Prima facie taxation at 28%		510	804
<i>Plus taxation effect of:</i>			
Net prior years (over) / underestimation		(27)	200
Impact of change in tax legislation – building depreciation		–	(580)
Non-deductible / (assessable) items		78	73
TAX EXPENSE FOR THE YEAR		561	497
<i>The tax expense for the year is represented by:</i>			
Current taxation		330	1,282
Deferred taxation	7	231	(785)
		561	497

ESR conducted a review in the 2011/12 year to assess the division of its buildings between depreciable and non depreciable components for tax purposes. As a result of this review a credit of \$580,000 was recognised in tax expense in the year 30 June 2012.

4. PROPERTY, PLANT AND EQUIPMENT

Group	Freehold land \$'000s	Buildings and leasehold improvements \$'000s	IT equipment and software \$'000s	Plant, equipment and vehicles \$'000s	Assets under construction \$'000s	Total \$'000s
AT 1 JULY 2011						
Cost	476	24,367	8,519	25,948	272	59,582
Accumulated depreciation	–	(4,608)	(7,286)	(17,481)	–	(29,375)
NET BOOK VALUE AT THE BEGINNING OF THE YEAR	476	19,759	1,233	8,467	272	30,207
YEAR ENDED 30 JUNE 2012						
Net book value at the beginning of the year	476	19,759	1,233	8,467	272	30,207
Additions	–	371	1,397	2,307	854	4,929
Transfers:						
– from assets under construction	–	149	–	8	(157)	–
Disposals	–	(6)	–	(14)	–	(20)
Depreciation for the year	–	(552)	(1,018)	(2,476)	–	(4,046)
NET BOOK VALUE AT THE END OF THE YEAR	476	19,721	1,612	8,292	969	31,070
AT 30 JUNE 2012						
Cost	476	24,882	9,894	27,708	969	63,929
Accumulated depreciation	–	(5,161)	(8,282)	(19,416)	–	(32,859)
NET BOOK VALUE AT THE END OF THE YEAR	476	19,721	1,612	8,292	969	31,070
YEAR ENDED 30 JUNE 2013						
Net book value at the beginning of the year	476	19,721	1,612	8,292	969	31,070
Additions	–	149	762	1,479	4,746	7,136
Transfers from assets under construction	–	4,096	240	997	(5,333)	–
Depreciation for the year	–	(749)	(1,021)	(2,525)	–	(4,295)
NET BOOK VALUE AT THE END OF THE YEAR	476	23,217	1,593	8,243	382	33,911
AT 30 JUNE 2013						
Cost	476	29,128	7,456	30,097	382	67,539
Accumulated depreciation	–	(5,911)	(5,863)	(21,854)	–	(33,628)
NET BOOK VALUE AT THE END OF THE YEAR	476	23,217	1,593	8,243	382	33,911

IT equipment recognised under finance leases (where ESR is a lessee) included in the above table has the following values.

Group	30 June 2013 \$'000s	30 June 2012 \$'000s
Cost – capitalised finance lease assets	820	1,074
Accumulated depreciation	(317)	(693)
NET BOOK VALUE AT THE END OF THE YEAR	503	381

ESR does not have any property, plant and equipment used as security for liabilities.

Restriction on title

In relation to the transfer of land owned by the Company, shareholding ministers shall have regard to the principles of the Treaty of Waitangi in accordance with section 10 of the Crown Research Institutes Act 1992. Properties owned by the Company in Christchurch, Wellington and Auckland have caveats on the land as required by section 31 of the Crown Research Institutes Act 1992, which maintains the general provisions of the Public Works Act 1981. The Company complies with section 31 of the Crown Research Institutes Act 1992.

5. INTANGIBLE ASSETS

Group	Computer software – externally purchased \$'000s	Computer software – internally generated \$'000s	Customer contracts \$'000s	Assets under construction \$'000s	Total \$'000s
AT 1 JULY 2011					
Cost	2,224	2,183	–	3,711	8,118
Accumulated amortisation	(1,746)	(1,997)	–	–	(3,743)
NET BOOK VALUE AT THE END OF THE YEAR	478	186	–	3,711	4,375
YEAR ENDED 30 JUNE 2012					
Net book value at the beginning of the year	478	186	–	3,711	4,375
Additions	365	463	1,338	994	3,160
Transfers from assets under construction	522	379	–	(901)	–
Impairment losses	–	(88)	–	–	(88)
Amortisation for the year	(603)	(218)	(126)	–	(947)
NET BOOK VALUE AT THE END OF THE YEAR	762	722	1,212	3,804	6,500
AT 30 JUNE 2012					
Cost	3,108	2,908	1,338	3,804	11,158
Accumulated amortisation and impairment losses	(2,346)	(2,186)	(126)	–	(4,658)
NET BOOK VALUE AT THE END OF THE YEAR	762	722	1,212	3,804	6,500
YEAR ENDED 30 JUNE 2013					
Net book value at the beginning of the year	762	722	1,212	3,804	6,500
Additions	173	–	–	2,837	3,010
Transfers from assets under construction	1,669	3,712	–	(5,381)	–
Amortisation for the year	(607)	(469)	(227)	–	(1,303)
NET BOOK VALUE AT THE END OF THE YEAR	1,997	3,965	985	1,260	8,207
Cost	7,610	6,620	1,338	1,260	16,828
Accumulated amortisation and impairment losses	(5,613)	(2,655)	(353)	–	(8,621)
NET BOOK VALUE AT THE END OF THE YEAR	1,997	3,965	985	1,260	8,207

ESR does not have any intangible assets where title is restricted or used as security for liabilities.

Assets under construction relates to the development of a new operational system. Individual laboratories are being implemented in a phased approach over the next eight months with the final laboratory expecting to go live in February 2014.

6. BUSINESS COMBINATIONS

On 1 December 2011, ESR acquired the business and net assets of the National Radiation Laboratory (NRL). NRL performs radiation monitoring services for local and international customers. The acquisition is expected to increase ESR's commercially generated revenue, provide additional profits to ESR and reduce cost through economies of scale. The excess consideration paid over the fair value of net tangible assets acquired of \$1,338,000 is attributable to the acquired customer base and the expectation of future profits from these contracts.

30 June 2012

\$'000s

Total purchase consideration	– cash paid	2,000
	– additional consideration payable	204
		2,204

RECOGNISED AMOUNTS OF IDENTIFIABLE NET ASSETS ACQUIRED AND LIABILITIES ASSUMED

Property, plant and equipment	811
Accounts receivable	181
Revenue in advance	(295)
Inventories	371
Employment benefit liabilities	(202)
Net identifiable assets	866
Customer contracts and other identifiable intangible assets	1,338
TOTAL	2,204

Acquisition related costs

Acquisition related costs totalling nil (2012:\$88,000) have been charged to administration expenses and are included in the Statement of Comprehensive Income.

Revenue and profit contribution

The acquired business has contributed revenues of \$3,182,000 since 1 December 2011. The business also contributed a profit before income tax of \$401,000 in the same period. If the acquisition had occurred on 1 July 2011 consolidated revenue and consolidated profit before income tax for the year ended 30 June 2012 would have been \$60,079,000 and \$3,157,000 respectively.

There were no business combinations in the current period.

7. DEFERRED TAXATION

Deferred tax assets and liabilities are attributed to the following:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Balance at the beginning of the year	(3,255)	(4,040)
Transfer from current tax	48	–
Statement of profit or loss and other comprehensive income charge	(231)	785
BALANCE AT THE END OF THE YEAR	(3,438)	(3,255)

	Accelerated tax depreciation \$'000s	Employee benefits and provisions \$'000s	Total \$'000s
YEAR ENDED 30 JUNE 2012			
Balance at the beginning of the year	(4,898)	858	(4,040)
Over provision in prior year	–	14	14
Impact of change in tax legislation – building depreciation	580	–	580
Charged / (credited) to statement of profit or loss and other comprehensive income	(34)	225	191
BALANCE AT THE END OF THE YEAR	(4,352)	1,097	(3,255)

YEAR ENDED 30 JUNE 2013			
Balance at the beginning of the year	(4,352)	1,097	(3,255)
Over provision in prior year	27	–	27
Transfer from current tax	111	(63)	48
Charged / (credited) to statement of profit or loss and other comprehensive income	(268)	10	(258)
BALANCE AT THE END OF THE YEAR	(4,482)	1,044	(3,438)

There are no unrecognised deferred tax assets or liabilities.

Deferred tax liabilities expected to be settled within 12 months total \$696,000 (2012: \$226,000).

8. TRADE AND OTHER RECEIVABLES

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Trade debtors	10,944	11,809
Provision for doubtful debts	(77)	(20)
	10,867	11,789
Prepayments	988	1,167
	11,855	12,956

As at 30 June 2013, trade receivables of \$567,000 (2012: \$516,000) were past due but not impaired. These relate to a number of customers for whom there is no recent history of default. The ageing analysis of these trade receivables is as follows:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Past due 1 – 30 days	220	268
Past due 31 – 60 days	115	151
Past due > 61 days	232	97
	567	516

9. TRADE AND OTHER PAYABLES

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Accrued expenses	1,005	817
Payroll and GST accruals	1,466	1,184
Revenue in advance	787	1,732
Trade payables	6,585	9,614
	9,843	13,347

10. EMPLOYEE BENEFITS

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Annual leave accrual	2,357	2,418
Service leave accrual	338	302
Other	18	19
CURRENT LIABILITIES	2,713	2,739
Service leave accrual	864	888
Retirement leave accrual	268	198
Other	6	12
NON-CURRENT LIABILITIES	1,138	1,098

11. FINANCE LEASE LIABILITIES

Future minimum lease payments are as follows:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Not later than one year	316	222
Later than one year and not later than five years	247	258
Later than five years	–	–
TOTAL MINIMUM LEASE PAYMENTS	563	480
Future finance charges on finance leases	(17)	(20)
PRESENT VALUE OF FINANCE LEASE LIABILITIES	546	460

The finance leases relate to IT equipment. Upon termination of the initial lease period, ESR can either choose to extend the term further, or return the leased assets to the lessor. There is no option to purchase the leased assets upon termination of the lease.

The present value of finance lease liabilities are as follows:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Not later than one year	309	217
Later than one year and not later than five years	237	243
Later than five years	–	–
	546	460

12. INCOME TAX (RECEIVABLE) / PAYABLE

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Balance at the beginning of the year	325	(249)
Current year charge	330	1,068
Prior period adjustment	48	214
Provisional taxation payments	(723)	(708)
BALANCE AT THE END OF THE YEAR	(20)	325

13. BORROWINGS

ESR holds a multi-option credit facility with Westpac Banking Corporation for \$6,000,000 (2012: \$6,000,000), which is provided subject to ESR meeting an equity ratio covenant specified by the bank. The facility expires in March 2016. The facility has been used during the year to cover working capital movements (30 June 2012: nil). All amounts have been repaid by balance date.

There were no breaches of the equity ratio covenant during the year.

14. EQUITY

SHARE CAPITAL

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
8,494,000 ORDINARY \$1 SHARES (ISSUED AND FULLY PAID)	8,494	8,494

All ordinary shares rank equally with one vote attached to each fully paid ordinary share.

No dividends were proposed or declared for the 30 June 2013 year (2012: nil).

15. RECONCILIATION OF PROFIT / (LOSS) AFTER TAXATION TO CASH FLOWS FROM OPERATING ACTIVITIES

Note	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
PROFIT FOR THE YEAR AFTER TAXATION	1,262	2,376
NON-CASH ITEMS:		
Depreciation and amortisation expense	4/5 5,597	4,993
Impairment of intangible assets	5 –	88
Bad debts written off	2 15	9
Fair value loss on financial assets at fair value through profit and loss	2 57	–
Deferred tax charged to the income statement	7 231	(785)
Foreign exchange losses	2 12	34
Fair value loss / (gain) on derivatives	2 58	(84)
	5,970	4,255
IMPACT OF CHANGES IN INVESTING ACTIVITIES:		
Loss on sale of assets	2 –	20
	–	20
FINANCING		
Finance charge on leases	16	11
	16	11
CHANGES IN WORKING CAPITAL:		
Decrease / (increase) in trade and other receivables	1,243	(2,575)
(Decrease) / increase in income tax payable	(347)	574
Decrease / (increase) in inventories	517	(237)
Increase in employment benefits	14	694
Increase in financial liabilities	86	–
(Decrease) / increase in trade and other payables	(3,505)	2,589
	(1,992)	1,045
NET CASH INFLOW / (OUTFLOW) FROM OPERATING ACTIVITIES	5,256	7,707

16. INVESTMENTS

SUBSIDIARY COMPANIES

ESR has two wholly owned, non-trading, subsidiary companies:

NAME	BALANCE DATE	COUNTRY OF INCORPORATION
ESR Limited	30 June	New Zealand
The Institute of Environmental Science and Research Limited	30 June	Australia

All subsidiaries have remained non-trading during the period.

At balance date the investment in these subsidiaries had a nil carrying value.

17. COMMITMENTS

CAPITAL COMMITMENTS

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Property, plant and equipment	565	3,286
TOTAL CAPITAL COMMITMENTS	565	3,286

Included in the above table as at 30 June 2013 is an amount of \$112,000 (30 June 2012: \$2,915,000) which relates to the re-development of the Mount Albert Science Centre (MASC).

OPERATING LEASE COMMITMENTS

The future aggregate minimum lease payments under non-cancellable operating leases are as follows:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Not later than one year	569	646
Later than one year and not later than five years	917	1,704
Later than five years	–	–
TOTAL OPERATING COMMITMENTS	1,486	2,350

ESR leases land, a building, equipment and vehicles. There is a renewal option in respect of the land and building lease. There are no renewal options or options to purchase in respect of vehicles held under operating leases.

ESR has a number of standard operational agreements for the purchase of materials and consumables that have both fixed and variable components, some of which extend beyond one year.

18. RELATED PARTY TRANSACTIONS AND KEY MANAGEMENT PERSONNEL

RELATED PARTY TRANSACTIONS

ESR is a wholly owned entity of the Crown. ESR enters into transactions with other Crown entities and Government departments. Related parties include the subsidiary entities disclosed in note 16. There have been no transactions with these related parties in the year ended 30 June 2013 (30 June 2012: nil).

The following transactions were carried out with related parties:

- There are close family members of key management personnel employed by ESR. The terms and conditions of those arrangements are no more favourable than those ESR would have adopted if there were no relationship with key management personnel.
- Fees paid to directors during the year were \$190,000 (30 June 2012: \$190,000), with no balances outstanding at balance date (30 June 2012: nil).

No provision has been required, nor any expense recognised, for impairment of receivables from related parties.

KEY MANAGEMENT PERSONNEL COMPENSATION

Key management personnel comprise the chief executive officer, members of the Senior Leadership Team and the directors. Key management personnel compensation is disclosed below.

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Salaries and other short-term employee benefits	1,650	1,803
Termination benefits	86	272
Other long-term employee benefits	32	56
Directors' fees	190	190
TOTAL KEY MANAGEMENT PERSONNEL COMPENSATION	1,958	2,321

19. FINANCIAL INSTRUMENTS BY CATEGORY

	Loans and receivables \$'000s	Fair value through profit or loss \$'000s	Total \$'000s
30 JUNE 2012			
ASSETS AS PER BALANCE SHEET			
Trade and other receivables excluding prepayments	11,789	–	11,789
Derivative	–	84	84
Cash and cash equivalents	7,232	–	7,232
TOTAL	19,021	84	19,105

	Financial liabilities at amortised cost \$'000s	Fair value through profit or loss \$'000s	Total \$'000s
Liabilities as per balance sheet			
Finance lease liabilities	460	–	460
Trade and other payables	11,615	–	11,615
TOTAL	12,075	–	12,075

	Loans and receivables \$'000s	Fair value through profit or loss \$'000s	Total \$'000s
30 JUNE 2013			
ASSETS AS PER BALANCE SHEET			
Trade and other receivables excluding prepayments	10,867	–	10,867
Cash and cash equivalents	2,136	–	2,136
TOTAL	13,003	–	13,003

	Financial liabilities at amortised cost \$'000s	Fair value through profit or loss \$'000s	Total \$'000s
LIABILITIES AS PER BALANCE SHEET			
Finance lease liabilities	546	–	546
Derivative	–	58	58
Trade and other payables	9,056	–	9,056
TOTAL	9,602	58	9,660

20. FINANCIAL RISK MANAGEMENT

ESR's activities are exposed to a variety of financial risks: market risk, credit risk, liquidity risk, cash flow risk and fair value interest rate risk. ESR's overall risk management programme focusses on the unpredictability of financial markets and seeks to minimise potential adverse effects on ESR's financial performance. The policies approved and financial instruments being utilised at balance date are outlined below.

A) MARKET RISK

In accordance with its Treasury Management Policy, ESR uses derivative financial instruments to economically hedge its exposure to foreign exchange risks from its operational, financing and investment activities. These derivatives are classified at fair value through profit or loss, and gains and losses are recognised in the statement of profit or loss and other comprehensive income.

i) Foreign exchange risk

Foreign exchange risk occurs as a result of transactions denominated in a currency other than ESR's functional currency of New Zealand dollars. Currencies commonly transacted in, and giving rise to foreign exchange risk include the United States dollar, Australian dollar and the Pound sterling. ESR is subject to foreign currency risk through its trade receivables and trade payables balances.

Where a material foreign currency balance is entered into (exposures equivalent to greater than New Zealand dollar \$100,000), ESR is required by the Treasury Management Policy to hedge its exposure to the currency through the use of forward exchange contracts.

ESR held one forward exchange contract of US \$1,034,000 at 30 June 2013 (30 June 2012: US \$922,000).

The carrying amounts of the Group's trade and other receivables denominated in foreign currencies are:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Australian dollar	149	276
Euro	263	67
United States dollar	285	425
Other	13	3
	710	771

The carrying amounts of the Group's trade and other payables denominated in foreign currencies are:

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
Australian dollar	40	49
Pound sterling	10	–
United States dollar	36	3
Other	4	6
	90	58

ii) Interest rate risk

As at reporting date, ESR is subject to interest rate risk through the holding of cash and cash equivalents. ESR uses a mixture of call and short-term deposit investment accounts to hold excess funds. Available interest rates are monitored to ensure the best return on cash.

When ESR is required to draw down its credit facilities, interest rate risk is managed through entering into a predetermined mixture of floating and fixed rate borrowings, depending on the level of borrowings entered into. ESR does not have any borrowings as at 30 June 2013 (30 June 2012: nil).

iii) Market risk sensitivity analysis

ESR is exposed to market risk through the holding of the following financial instruments: cash, trade receivables and trade payables. ESR management has analysed the below sensitivities in market risk factors over a 12 month period:

- proportional foreign exchange rate movement of -10% (depreciation of New Zealand dollar) and +10% (appreciation of New Zealand dollar) against the foreign currencies; and
- a parallel shift of +1% / -1% in market interest rates in New Zealand.

If these movements were to occur (all other variables held constant), the impact on ESR's reported profit before income tax expense and equity at balance date is:

- foreign currency \$62,000 (30 June 2012: \$71,000)
- interest rate \$21,000 (30 June 2012: \$72,000)

B) CREDIT RISK

Credit risk refers to the risk that a counterparty will default on its contractual obligations, resulting in financial loss to ESR. The financial instruments that expose ESR to credit risk are principally cash and cash equivalents, and trade receivables.

Bank balances and short-term investments (comprising cash and cash equivalents) are held with New Zealand registered banks in accordance with ESR's Treasury Management Policy. The majority of high value trade receivables comprise government entities and therefore the potential risk of default is low. ESR has a Contracts Policy which requires assessment of credit worthiness of potential clients, where the value of the contract is material as defined in the policy.

A provision for doubtful debts is maintained in respect of trade receivables and this is reassessed on a regular basis. No collateral is held by ESR in respect of cash and cash equivalents, and trade receivables as at 30 June 2013 (30 June 2012: nil).

The carrying amount of financial assets recognised in the statement of financial position best represents ESR's maximum exposure to credit risk at the reporting date.

As at 30 June 2013 the trade receivables balance included \$8,527,000 (30 June 2012: \$9,365,000) owed by entities within, or owned by, the New Zealand Government. It is not believed that there is any material risk of loss with these receivables.

C) LIQUIDITY RISK

Prudent liquidity risk management implies the availability of funding through adequate levels of committed credit facilities. Liquidity risk is monitored through the forecasting of cash flows, and ensuring that the committed credit lines in place remain adequate for requirements.

Contractual undiscounted maturity analysis of financial liabilities is presented below:

GROUP

	30 June 2013					30 June 2012				
	Carrying value \$'000s	Less than 1 year \$'000s	1–2 years \$'000s	2–5 years \$'000s	Greater than 5 years \$'000s	Carrying value \$'000s	Less than 1 year \$'000s	1–2 years \$'000s	2–5 years \$'000s	Greater than 5 years \$'000s
Trade payables	9,056	9,056	–	–	–	10,431	10,431	–	–	–
Finance lease liabilities	546	309	205	32	–	460	217	171	72	–
	9,602	9,365	205	32	–	10,891	10,648	171	72	–

D) FAIR VALUES

The carrying value of financial assets and liabilities recorded in the financial statements approximate their fair values.

Fair value is generally based on the contracted amount payable / receivable of financial assets and financial liabilities, being the amount for which the financial instrument is to be exchanged. Fair value includes the impact of any assessed impairment of the financial instruments – please refer to the statement of significant accounting policies for details of each financial instrument and their recognition criteria.

E) CAPITAL RISK MANAGEMENT

ESR's objectives when managing capital are to maintain financial stability, achieve sustainable growth and to realise its strategic goals and targets, all within the risk appetite of its shareholder and management.

In line with Government requirements, ESR monitors its capital structure through the return on equity and gearing ratios. Government provides ESR with guideline targets with the expectation that an appropriate average return is achieved over time, rather than requiring that ESR meet the specified targets annually. At reporting date, the Government-provided guideline targets are 9 percent for the return on equity, and 30 percent for the gearing ratio (2012: same).

Each year ESR internally sets return on equity and gearing ratio targets, bearing in mind the overall results expected by Government. The ratios are reported in the Statement of Corporate Intent.

The return on equity and gearing ratios as at 30 June 2013 and 30 June 2012 were as follows, along with the relevant annual targets set by ESR.

	Group 30 June 2013 \$'000s	Group 30 June 2012 \$'000s
RETURN ON EQUITY RATIO		
Profit / (loss) for the year	1,262	2,376
Average equity	38,487	36,668
ACTUAL RATIO	3.3%	6.5%
TARGET RATIO	8.0%	8.0%
GEARING RATIO		
NET DEBT		
Finance lease liabilities – current	309	217
Finance lease liabilities – non current	237	243
	546	460
EQUITY	39,118	37,856
ACTUAL RATIO	1.4%	1.2%
TARGET RATIO	0.0%	0.0%

21. CONTINGENT LIABILITIES

The directors are satisfied that there are no claims outstanding that would have a material impact on ESR's financial position, as at 30 June 2013 (30 June 2012: nil).

22. SUBSEQUENT EVENTS

There were no events subsequent to reporting date that require disclosure in the financial statements.

Directory

ESR BOARD OF DIRECTORS (AS AT 30 JUNE 2013)

Dr Susan Macken – Chair
Ross Peat – Deputy Chair
Marion Cowden
Professor Bill Denny
Dr Judith Johnston
Tahu Leslie Potiki
Patricia Schnauer

ESR STRATEGIC LEADERSHIP TEAM

Graham Smith – Chief Executive
Dr Keith Bedford – General Manager, Forensic
Esther Livingston – General Manager, Human Resources
Amanda Malu – General Manager, External Relations and Marketing
Stephen Pyne – Chief Information Officer
Dr Fiona Thomson-Carter – General Manager, Environmental Health
Nigel Thomson – General Manager, Business Services

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Chris Barber of PricewaterhouseCoopers on behalf of the Auditor-General

BANKER

ANZ Bank New Zealand Limited

SOLICITOR

Buddle Findlay

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