



# **SCOPE REPORT FOR RESOURCE RECOVERY UNIT STANDARDS AND QUALIFICATIONS**

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## EXECUTIVE SUMMARY

This scoping report was commissioned by the NZ Extractive Industries Training Organisation on behalf of the resource recovery industry. The content has been derived from the Sector Advisory Group comprising two representatives each of four key industry associations: Recycling Operators of New Zealand, Scrap Metal Recyclers of New Zealand, WasteMINZ, and Zero Waste New Zealand.

Resource recovery has been selected as a non exclusive umbrella term for the whole industry sector. This selection is both recognition of the potential resource value of the waste stream and the changing nature of the service provided by this industry within New Zealand society. The resource recovery industry includes reuse, identification, reduction, collection, and resale of organic and inorganic commodities excluding water. The solid waste area deals with residual waste collection, processing, and disposal. Competency is required in generic and communication skills, transferable skills relating to despatch, health, safety, sorting, storage, machinery operation, marketing, management and planning; and in skills relating to specific commodities and resources including hazardous materials. All levels of employment from initial entry, to operations, supervision, management and planning are relevant. Unit standards for the competencies listed will be developed as prioritised by the Sector Advisory Group and will take into account their use in proposed qualifications in scrap metal recycling, solid waste, resource recovery operations, and resource recovery implementation.

The Sector Advisory Group has nominated key personnel to advise the unit standard writer on specific skills and knowledge areas. Lists of competencies have been grouped by common skills, and industry sub sectors with indications of level given where relevant.

In addition to industry personnel, advice may be sought from central and local government, Australian industry training sources, and related associations. Compliance with relevant legislation is specified in individual unit standards.

The training needs of the large number of immigrants employed in this industry needs to be taken into consideration. Competencies will take account of the global nature of resource recovery and industry initiatives to minimise waste.

Priorities for the sequence of development of unit standards have been determined to be of use to the maximum number of trainees.

## SCOPING REPORT

### Introduction

The Tertiary Education Commission granted the NZ Extractive Industries Training Organisation an extension of coverage to set standards for the areas of scrap metal recovery, resource recovery, waste management (excluding water), recycling and zero waste effective from 1 March 2004.

In early April 2004 the Zero Waste Academy convened a forum of key associations and individuals in Wellington to discuss the need for a comprehensive strategy for zero waste training, education, research and qualifications including NZQA accreditation. The commitment of Scrap Metals Recycling Association of NZ, Recycling Operators of New Zealand (RONZ) and Zero Waste Academy to support the EXITO application was confirmed at this forum. These three groups were invited to submit two representatives each to form a Waste Management Sector Advisory Group SAG to advise the EXITO. Subsequently the WasteMINZ has also determined to support the development of industry training under the leadership of EXITO. Accordingly WasteMINZ has become the fourth association and hence has two representatives appointed to the SAG.

At the initial meeting held on July 19<sup>th</sup> 2004 at EXITO, Christchurch this SAG was renamed the Resource Recovery Sector Advisory Group and it began to scope the areas specified in the gazetted coverage. The guidelines for scoping reports are summarised in Appendix 1.

### A Definition of the Scope

The most encompassing term to describe the area under investigation is Resource Recovery. This non exclusive umbrella term acknowledges the potential resource value of the waste stream and recognises the changing nature of the services provided within New Zealand. These services now include resource conservation, efficiency, recovery and reuse, alongside the traditional services related to sanitary disposal. The scope includes identification, collection, processing, and end use of both organic and inorganic materials that have completed a cycle of use; and the management, planning, reduction, and marketing services related to them. The recovery of organic commodities includes green waste, bio energy, putrescibles, fibres, and wood. The recovery of inorganic commodities includes ferrous metals, non ferrous metals, plastics, and glass. The project encompasses construction and demolition materials, landfill operations, and hazardous materials, but excludes wastewater and its treatment. Education about resource reduction, reuse, recovery, and recycling and the sustainable environment is to be included where it is required for the competence of people in the industry. The geographic differences in the end use of recycled commodities will need to be taken into account. The range of diverse skills required within the industry extends to all aspects of the New Zealand government's Waste Strategy (2002) "Towards Zero Waste and a Sustainable New Zealand".

## **Potential Points of Overlap within the Industry**

All sections of the industry require competence in protecting the health and safety of people and the environment, and in literacy, numeracy, and communication skills. Some sections will also require public relations skills. There will be overlaps in the identification of materials, driver licence (and endorsement) requirements, collection, receipt and delivery of goods, forklift operations, sorting of materials, developing an emergency plan, first aid certification, knowledge of compliance requirements, storage procedures, and approved handler training.

## **Links with Other Industries**

The area under consideration has links with the local government and customs sectors, and with the commercial road transport, civil construction, demolition, wastewater, and retailing industries. Existing unit standards registered by these industries and others will be utilised where appropriate.

## **Industry Entry**

### **Initial**

First aid, literacy, numeracy, protection of health and safety, and other generic skills give entry to this industry. It accepts school leavers and some members participate in the secondary schools Gateways programme. Other employment programmes that are used by this industry include those run by the Department of Corrections, Department of Social Welfare (WINZ), Workbridge, Workbase, and Enable. The community enterprise section of the industry trains people within the sector. There is a tendency in the industry to give opportunities to workers made redundant by enterprise closures and to employees' family members. Part time and volunteer modes of employment may act as pathways to enter the industry and are a dimension of the functional industry activity and hence management concern associated with council and community enterprises.

### **Operations**

Certificates required in some sections include first aid, and approved handlers. For some functions in the industry employees will require specific driver licences (e.g. goods service, endorsement F).

### **Management and Supervision**

Second hand dealer licences will soon become mandatory for all people who receive or sell metal at metal recovery enterprises. For those sections that export recovered materials, there are commodity export certificates and container security requirements.

## Pathways for Training

The different types of resources recovered in this industry require specific knowledge, handling, and processing therefore the training pathways tend to be vertical within each section. There is some transfer of identification, sorting, and plant operation skills between the collection, commodity recovery, and residual waste sections. Horizontal links across resource (or commodity) type specifically occur during collections, for example at the kerbside or in drop-off areas; and during sorting/processing facilities where multiple resource types maybe handled at a single location. Hence some Council, LATE, private and community enterprise sectors of this industry require training for employees to work in operational areas covering a range of recoverable commodities. Training in a number of commodity areas may lead to managing a resource recovery centre.

As resource recovery is an international industry, training in specific sections of the industry may lead to opportunities for employment overseas at both operational and management levels. Conversely as the New Zealand industry grows it is likely to continue to attract employees from emigrant communities.

General understanding of New Zealand and global resource recovery theory, and practice is recommended for all employees in the industry. Knowledge and attitudes will be consistent with industry initiatives such as BusinessCare, Fullcircle, Lifeafterwaste, REBRI, and the Packaging Accord.

Transferable skills in the resource recovery industry include weighbridge, forklift, wheeled loader, and baling operations. These could be included in the core elective section of a National Certificate in Resource Recovery (Operations) with strands in Glass, Hazardous Commodities, Plastic, Paper, Reusable Goods, Construction and Demolition, Composting, and Organics. Each strand would include skills in identification, collection, sorting, processing, and transporting of the specific commodity.

This qualification would have links with a National Certificate in Scrap Metal Recycling.

It would also link with a National Certificate in Solid Waste (, or qualifications in Solid Waste Collection, Solid Waste Processing, and Solid Waste Disposal).

All the above qualifications would have links with a National Certification in Resource Recovery (Implementation) that would cover the knowledge and skills for implementing the New Zealand Waste Strategy – Towards Zero Waste and a Sustainable New Zealand.

## Key Stakeholders

Recycling Operators of NZ RONZ  
Ken Johns, Astron Plastics Ltd  
Miljenko Pavlinic, H G Leach & Co

Scrap Metals Recycling Assn of NZ  
John Jury, Sims Pacific Metals  
Trevor Munro, Metacorp NZ Ltd

WasteMINZ  
Shane Burke, Enviro Services Ltd  
Mike Huddleston, Onyx Group Ltd

Zero Waste New Zealand  
Jonathon Hannon, Zero Waste Academy  
Sheryl Stivens, Zero Waste Community Enterprise Network

NZ Extractive Industries Training Organisation  
Graham Burt

## Other Players

The Sector Advisory Group recommended key personnel to be contacted for advice on developing unit standards in specified areas. A list of these people is shown in Appendix 2. Additional advisors may be included as the project progresses.

## Potential Sources of Information

WasteMINZ Conference  
South Island Organic Recyclers Training Discussion Group  
Australian National Training Authority (ANTA)  
Territorial authorities  
Australian Working Group for Award Restructuring Groups 1-14  
Plastics Industry Sustainability Codes  
The Packaging Accord  
Ministry for the Environment National Environmental Standards  
New Zealand Water and Waste Association  
Workplaces selected for their observance of industry best practice  
Global training and development programmes.

Definitions of terms used in the industry will be based in the first instance on New Zealand terminology as found in Ministry for the Environment publications, NZ Standards and industry publications, and secondly on appropriate international documents, such as, the *Recycled Organics Dictionary and Thesaurus* published by the University of New South Wales. See Appendix 4.

## Legislation

Legislation relevant to this industry includes but is not limited to the following Acts (including subsequent amendments and enabled Regulations), and documents.

- Employment Relations Act 2000
- Hazardous Substances and New Organisms Act 1996
- Health and Safety in Employment Act 1992
- Local Government Acts 1974 and 2002
- Resource Management Act 1991
- Second Hand Dealers Act 2004
- New Zealand Waste Strategy (MfE)
- Land Transport Rules (LTNZ, previously LTSA)

## Matters Relating To Gender, Religion, Te Tiriti Etc

No specific issues were identified in the industry relating to gender, religion, or the Treaty of Waitangi. Many workplaces employ immigrants who need to have signage and procedures written in their native language.

## Overview of Human Resources, Education, & Training Needs for the Present and Future

No figures are currently available of numbers in employment in sectors or industry.

The only recognised qualification at present is the National Certificate in Road Transport of Waste and Recoverable Resources offered by NZ Road Transport and Logistics ITO.

All other training is provided on job and documented by the employer. Zero Waste partners provide training for resource recovery centre managers and environmental education for delivering school and business programmes. Those companies who have global links benefit from overseas training materials and sometimes courses are delivered in New Zealand.

The resource recovery industry engages with and underwrites a large part of the environmental activities of most other industries in the country. It also has to compete for and to retain skilled staff with all other New Zealand industries. This challenge is made more acute by the rapid

changes within and demands placed upon the industry as it grows beyond a narrow emphasis on collection and disposal to require a broader set of knowledge-rich specialities associated with the spectrum of resource recovery options and increasingly stringent environmental standards.

Increasing public awareness of the impact of waste socially, economically, and on the environment means an increasing number of employment opportunities are arising in the resource recovery industry. As a corollary to that, there is likely to be a reduction in the waste disposal sector.

There is a need to bring new entrants straight into the industry from school and this can be encouraged by using the New Apprenticeship Scheme.

The Sector Advisory Group expressed strong concern that it be involved in approving the accreditation of training providers. The current Accreditation and Moderation Action Plan requires that industry evaluate the provider's documentation for all levels. Industry involvement in an accreditation visit (required only for Levels 4 and above) may be waived when EXITO has been consulted during the development of the accreditation application.

Once the New Zealand qualifications and training have been instigated there will be opportunities to assist the small nations in the Pacific to develop resource recovery training.

### **Priorities for Unit Standard Development**

A survey of Sector Advisory Group members resulted in the following sequence for developing the unit standards:

- Generic resource recovery unit standards and those relating to safety
- Resource recovery centres and transfer stations
- Scrap metal recycling
- Organics
- Hazardous materials
- Construction and Demolition

Priority is to be given to unit standards that will be used by the most trainees and new entrants to the industry; and to those that will enable core qualifications to be developed for use.

## Qualifications

Qualifications are to be developed following the registration of unit standards. The qualifications contain relevant unit standards from the domain or subfield from which the qualification takes its title. But they may include unit standards from anywhere on the National Qualifications Framework. Qualifications at the same level may not overlap by more than 50%.

The Sector Advisory Group has determined that separate qualifications are required for Scrap Metal Recycling, Solid Waste, Zero Waste, and Resource Recovery. Each sector group will ascertain the number and level of qualifications it requires. For example, the Scrap Metal Recycling sector may require a Level 3 certificate for operators and a Level 4-5 certificate for managers. The level 3 certificate may have strands in Ferrous Metals and Non-ferrous Metals. Solid Waste may require a diploma for landfill management, and certificates for landfill operations, solid waste collection, and solid waste processing.

The qualifications may contain compulsory and elective sections. Where these are common to several industry groups a qualification may contain strands to cover each specialty area. For example, a National Certificate in Resource Recovery Operations may comprise a compulsory section of generic unit standards on safety, resource recovery theory, and resource recovery operations, and an elective section of unit standards in driver licensing, and strands in Glass, Plastics, and Paper Fibre. Candidates would need to complete the compulsory and elective sections and at least one strand. Where an industry group requires the qualification title to be less general, the domain name is used e.g. National Certificate in Organics Recycling. This could comprise a compulsory section of generic and organics unit standards and optional strands in Vermiculture and Bio energy. for specialists.

## Functions Covered by Existing Unit Standards

These lists include unit standards relevant to the Resource Recovery, Zero Waste, Scrap Metal and Solid Waste industries that are currently registered on the National Qualifications Framework. The lists are not definitive, relevant unit standards are also contained in other domains such as Introductory Communication Skills, Number, Measurement, First Line Management, Human Resources, Interpersonal Communications, Goods Service, and Retail and Distribution Core Skills, Distribution, and Sales.

### Unit Standards Covering Generic Skills

Domain	Id	Title	Level	Credit
Occupational Health and Safety Practice	497	<i>Protect health and safety in the workplace</i>	1	1
	17593	<i>Apply safe work practices in the workplace</i>	2	4
	17602	<i>Apply hazard identification and risk assessment procedures</i>	3	4
Workplace Health and Safety Management	5607	<i>Implement workplace health and safety management requirements</i>	4	25
Core Health	6402	<i>Provide resuscitation level 2</i>	1	1
	6401	<i>Provide first aid</i>	2	1
	6400	<i>Manage first aid in emergency situations</i>	3	2
Non Specialist Security Functions	6534	<i>Maintain a secure work environment</i>	2	2
	8615	<i>Manage personal safety in the workplace</i>	3	2
Hand-Operated Fire-Fighting Equipment	9020	<i>Demonstrate knowledge of hand operated fire fighting equipment and demonstrate their use</i>	3	9
Workplace Fire and Emergency Response	3271	<i>Suppress fire with hand held extinguishers and fixed hose reels</i>	2	1
Environmental Education	18663	<i>DKO and apply sustainable environmental management practices in the work place</i>	2	4
Delivery Of Adult Education And Training	7103	<i>Determine adult training requirements of individuals</i>	4	4
	7108	<i>Deliver on-job training for adults</i>	4	8

Domain	Id	Title	Level	Credit
	7115	<i>Create and maintain a positive learning environment for adult learners</i>	4	4
Interpersonal communications	9707	<i>DKO workplace communications</i>	1	5
	1277	<i>Communicate in a specified workplace</i>	2	3
Communication Skills - Reading	2989	<i>Read and assess texts to gain knowledge</i>	2	4
Service Sector - Core Skills	56	<i>Attend to customer enquiries face to face and on the phone</i>	1	2
	57	<i>Provide customer service in given situations</i>	2	2
	62	<i>Maintain personal presentation in the workplace</i>	2	2
Communication Skills - Writing	3483	<i>Fill in a form</i>	1	4
	3490	<i>Write an incident report</i>	1	3
Powered Industrial Lift Trucks	10852	<i>Operate a powered industrial lift truck fitted with forks (forklift)</i>	3	3
	10852	<i>Operate a PILT fitted with attachments on a work site</i>	3	3
Crane Operation	16617	<i>Use a truck loader crane to lift and place loads</i>	3	6
Temporary Traffic Management	5627	<i>Operate as a traffic controller for low volume &amp; level 1 roads</i>	3	4
Materials Management	17241	<i>Demonstrate knowledge of storage and materials handling at a manufacturing or industrial site</i>	2	4
Goods Service	1753	<i>Load and unload a goods service vehicle</i>	2	4
	17459	<i>Demonstrate and apply knowledge of manual handling of goods</i>	1	2

**Examples of Unit Standards Relating to Resource Recovery Sector**

Domain	Id	Title	Level	Credit
Food And Related Product Processing - Cleaning	7718	<i>Clean and sterilise food or beverage containers using automated washing equipment</i>	2	2
Pulp and Paper Technology	17668	<i>Explain the fundamentals of the recycling of fibre for paper making</i>	2	6

**Examples of Unit Standards Relating to Scrap Metal Recovery Sector**

Domain	Id	Title	Level	Credit
Physics	8646	<i>Demonstrate knowledge of electro magnetics</i>	4	4
Steel Product Handling	14482	<i>Use flame cutting equipment to cut mild steel</i>	2	2

**Unit Standards in the Domains: Driver Licence Classes and Driver Licence Endorsements**

Id	Title	Level	Credit
16606	<i>Demonstrate knowledge and skills required for full class 2 driver licence</i>	2	2
16608	<i>Demonstrate knowledge and skills required for full class 4 driver licence</i>	2	2
17574	<i>Operate a heavy rigid motor vehicle for a full class 2 drivers licence</i>	3	7
17576	<i>Operate a heavy rigid motor vehicle for a full class 4 drivers licence</i>	3	7
18496	<i>Demonstrate knowledge and skills for driving a forklift on a road for endorsement F (forklifts)</i>	3	2
16702	<i>Demonstrate knowledge and skills for driving on a road for endorsement R (rollers)</i>	3	3
16703	<i>Demonstrate knowledge and skills or driving on a road for endorsement T (tracks)</i>	3	3
16701	<i>Demonstrate knowledge and skills or driving on a road for endorsement W (wheels)t</i>	3	3

**Unit Standards in the Domain: Transportation of Waste and Recoverable Resources**

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
17188	<i>Demonstrate knowledge of health and safety for transportation of waste and recoverable resources</i>	2	3
17226	<i>Identify and isolate hazardous materials from waste deposited at a transfer station</i>	2	4
17189	<i>Operate a front end loader vehicle for transportation of waste</i>	3	8
17190	<i>Operate a gantry vehicle for transportation of waste</i>	3	8
17191	<i>Operate a hookload vehicle for transportation of waste</i>	3	8
17231	<i>Operate a liquid waste vacuum tanker</i>	3	12
17192	<i>Operate a low entry vehicle for transportation of waste</i>	3	8
17193	<i>Operate a rearload vehicle for transportation of waste</i>	3	8
17194	<i>Operate a sideloader vehicle for transportation of waste</i>	3	8
17195	<i>Operate a Smartlift 10 vehicle for transportation of waste</i>	3	8
17196	<i>Operate a Smartlift 20 vehicle for transportation of waste</i>	3	10
17198	<i>Operate a transfer vehicle used for transportation of waste bales</i>	3	8
17199	<i>Transfer waste containers to and from hookload vehicles and platforms</i>	3	2
17197	<i>Transfer waste containers to and from Smartlift 20 vehicles and UKW railway turntable wagons</i>	3	4
17228	<i>Control top loading of waste at a transfer station</i>	4	8
17227	<i>Load waste into a rearload unit at a transfer station</i>	4	8
17159	<i>Process waste through a compactor at a transfer station</i>	4	12

**Examples of Unit Standards Relating to the Solid Waste Sector**

<b>Domain</b>	<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
Agricultural Resource Maintenance	17208	<i>Demonstrate knowledge of waste management in an agribusiness context</i>	4	5
Leather Manufacture	8266	<i>Operate equipment for tannery waste disposal systems</i>	3	10
Metal Surface Finishing	2358	<i>Operate and control waste treatment process in metal surface finishing operations</i>	3	10
Pulp Making	3528	<i>Manage wood chip and waste storage systems</i>	2	6
Civil Engineering - Waste Management	11431	<i>Design solid waste facilities</i>	6	12
	11428	<i>Design wastewater systems for public utilities</i>	6	10
Dairy Environmental Management	20014	<i>Carry out a waste treatment process in the dairy industry</i>	3	8
	17616	<i>Dispose of waste materials in the dairy industry</i>	3	6
	4303	<i>Explain environmental effects monitoring and waste treatment in the dairy industry</i>	3	12
Process And Materials Engineering	11379	<i>Manage pollution in process waste streams</i>	6	6
Te Ao Turoa	16079	<i>Apply tikanga Maori practices for food preparation, storage and waste disposal in te ao turoa</i>	3	6
Cleaning Skills	1580	<i>Empty street litter bins</i>	2	2

## Proposed New Unit Standards To Be Written

### Functions in Resource Recovery Theory (17)

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Classify recoverable resources and residual waste	2	core
Outline recovery options for organic and inorganic resources	2	core
Explain legal and other obligations for resource recovery	2	core
Explain introductory principles and processing options for organic resource recovery and recycling - prerequisite for operational and higher level theory standards	2-4	core
DKO an environmental management plan at a resource recovery site	2	core
Relate the principles of environmental protection to the resource recovery industry	3	core
Demonstrate knowledge of hygiene and fitness for resource recovery work	3	core
Demonstrate knowledge of the resource recovery and recycling industry in New Zealand	3	core
Compare NZ treatments, process options, outcomes for managing resources/wastes	5	core
Demonstrate understanding of key concepts, relevant policy and legislation that relates to resource recovery, recycling and waste management in New Zealand	5	core
Explain the introductory principals and processing options for recovering and recycling an inorganic commodity (prerequisite)	3	core/elective
Prepare a non hazardous recoverable resource for transport	2-3	elective
Explain market (export and/or NZ) requirements for a recoverable resource	4	elective
Demonstrate knowledge of, and apply, Solid Waste Analysis Protocol (SWAP) including develop and implement auditing methodologies in NZ	4-5	elective
Research and discuss NZ and international best practice in RR and recycling, Include history, networks, innovation, relevance of application to a NZ context	5	elective
DKO key public and private sector responsibilities, strategic drivers and opportunities for RR, recycling and waste in NZ include role of industry associations and NGO's	5	elective
Research/discuss/apply SWOT analysis to international legislation including; EPR, CDL, landfill/incinerator ban, green tax, levies, and incentives	5	elective

**Core Functions in Resource Recovery Operations (23)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Identify and sort mixed resources for recycling and recovery at a transfer station?	2	core
Identify and sort mixed business/commercial resources for collection	2	core
Operate a weighbridge for resource recovery or solid waste	2	core
Prepare a non hazardous recoverable resource for transport	2-3	core
Use scales to weigh bulk resources	2	core
Stockpile bulk commodities for resource recovery	3	core
Demonstrate knowledge of storage requirements for a recoverable resource	3	core
Load transport containers in the resource recovery industry	3	core
Operate an entry gate for resource recovery or solid waste	3	core
Operate, assist and supervise the public in a drop off area suitable for the commodity types expected in a general resource recovery operation.	3	core
Communicate and explain key information related to 'separation at source' (preparation at home prior to visiting the drop-off area) and utilisation of the drop-off area, essential for safe and efficient functioning of a resource recovery operation	3	core
Operate a small compactor and baling machine for resource recovery operations	2	core
Operate a large compactor and baling machine for resource recovery operations - Describe safety issues and mechanical function, and operate.	3	core
Operate a conveyor for resource recovery operations /Demonstrate an awareness of the mechanical function and associated issues associated with a sorting conveyor for resource recovery operations and safely and efficiently operate this plant	3	core
Supervise a resource sorting process, including awareness of design, mechanical operation, scheduling, the transitioning commodity types, safety issues and efficiency	5	core
Plan, develop and communicate a promotion and publicity strategy and associated resources appropriate to resource recovery, recycling or zero waste context.	5	core
Design and develop the physical structures and signage for the overall drop-off area including appropriate containers for specific commodity types.	5	core
Identify and segregate material for disposal to clean fill	3	elective
Demonstrate knowledge of kerbside collection processes, machinery systems and issues and participate safely and efficiently in this activity either as a driver or a runner / sorter.	3	elective

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of the issues associated with storage of a processed recovered resource and safely and efficiently store these materials	3	elective
Plan, train and manage staff operating a drop off area handling the commodity types expected in a general resource recovery operation.	5	elective
Organise, schedule and supervise a routine kerbside collection programme including the development and implement of a safety management plan.	5	specialist
Organise, schedule and supervise a special kerbside collection including the development and implement of a safety management plan.	5	specialist

**Functions/Roles in Zero Waste Implementation (23)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Apply zero waste principles in own workplace	2	core
Discuss key concepts in zero waste theory and practice	3	core
Identify options for zero waste in a specified place (domestic, workplace, community)	3	core
Research, plan, and facilitate a community resource recovery or event recycling project (for example school based) based on current best practice	4	core
Explain the issues and design of a resource recovery facility	5	core
Explain current strategies to achieve resource recovery. Includes the working relationship between industry and community, improving awareness, participation, motivation, and key information.	5	core
Relate domestic resource recovery strategies to a socio-economic, demographic and cultural context	5-6	core
Explain the development of concepts of sustainability, resource efficiency, and cleaner production in NZ businesses Including theory and practice, key organisations and development of best practice.	4	core
Explain development and maintenance requirements for resource efficiency and cleaner production Includes using in-house staff, key person training, developing databases, programme follow-up and growing long term working relationships.	4	core
Demonstrate knowledge of and develop a programme for measurement and monitoring of resource efficiency and cleaner production.	5	core
Analyse an industry process for the implementation of zero waste principles	4	elective
Analyse a community or institution for the implementation of zero waste principles	4	elective
Facilitate a community zero waste project	4	elective
Research and advise on domestic and institutional resource recovery and recycling options	5	elective
Advise on methods of implementing zero waste in a specified context Industry or community. Includes competition, awards programme and festival events.	5	elective

**Functions/Roles in Zero Waste Implementation continued**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Plan and implement a product development initiative for zero waste. One of - school, community, commerce, industry. Includes –key principals for technology and product development in NZ, case studies, support mechanisms and organisations	5	elective
Develop and implement a program to support and empower and zero waste within communities Includes understanding the role of informal and micro-enterprise sectors in recycling.	5	elective
Explain options and priorities for resource efficiency and cleaner production in industry. Includes general principals, partnering	5	optional
Explain strategies for engaging industry partners in resource efficiency and cleaner production programmes Includes sourcing, promoting, identifying and removing barriers	5	optional
Plan, organise and conduct a site visit for the development of a resource efficiency and cleaner production partnering programme. Includes recording, reporting key information, observation sheets, process diagrams and video walkthrough	5	optional
Explain how to tailor resource recovery programmes to specific NZ industries. Based on case studies and practical experience	5	specialist
Advise on resource recovery options for commercial and retail enterprises	5	specialist
Advise on resource recovery options for an industry	5	specialist

**Functions/Roles in Scrap Metal Recycling (26)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of health, safety and environmental protection for scrap metal recycling	3	core
Identify and separate ferrous metals for scrap metal recycling	3	core
Identify and sort non ferrous metals for scrap metal recycling	3	core
Prepare scrap metal for recycling using lpg gas cutting equipment	3	core
Operate metal shredder for scrap recycling	3	core
Operate a baler for scrap metal recycling	3	core
Stockpile commodities at a scrap metal recycling facility	3	core
Respond to a spill incident at a scrap metal recycling facility	3	core
Weigh and price scrap metals at a recycling facility	3	core
Load a container with scrap metals to be reprocessed	3	core
Deliver metal for scrap metal recycling	3	elective
Prepare motor vehicles for scrap metal recycling	3	elective
Prepare white ware for scrap metal recycling	3	elective
Use a drop ball for scrap metal recycling	3	elective
Operate grapples at a scrap metal recycling facility	3	elective
Operate magnets at a scrap metal recycling facility	3	elective
Operate shears for scrap metal recycling	3	elective
Operate a guillotine for scrap metal recycling	3	elective
Operate an eddy current separator for scrap metal recycling	3	elective
Operate a wire shredder for scrap metal recycling	3	elective
Flatten motor vehicles for scrap metal recycling	3	elective
Bale motor vehicles for scrap metal recycling	3	elective
Operate a granulator for scrap copper recycling	3	specialist
Reprocess scrap metals by sweating	3	specialist
Demonstrate knowledge of export requirements for scrap metal recycling	5	specialist
Develop a site emergency plan for a scrap metal recycling facility	5	specialist

**Functions/Roles in Plastics Recovery (14)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of health, safety and environmental protection in the plastics recovery industry	3	core
Demonstrate knowledge of plastic types (codes and terminology) and contaminants	2	core
Identify and sort grades of plastic for reprocessing	2	core
Operate a guillotine for plastics recovery	3	core
Operate a plastics shredder for resource recovery	2	core
Detect Contamination and separate metals in plastic reprocessing operations	3	core
Identify and sort grades of plastic for recovery and export	2	elective
Operate a granulator for plastics recovery	3	elective
Operate an extruder for plastics recovery	3	elective
Change products in a plastic recovery process	3	elective
Operate bag stitching machine for resource recovery	2	elective
Monitor plant and processes for plastics recycling	4	elective
Demonstrate knowledge of export requirements for recovered plastics	5	specialist
Determine market requirements for plastics reprocessing and price commodities	5	specialist

**Functions/Roles in Paper Fibre Recycling and Recovery (5)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Dko health, safety, and environmental requirements for the recovery of paper and cardboard	2-3	core
Identify and sort paper and cardboard for recycling	2	core
Classify paper and cardboard for recycling	4	specialist
Monitor plant and processes for paper and cardboard recycling	4	elective
Determine market requirements and price commodities for paper and cardboard recovery and recycling	5	specialist

**Functions/Roles in Glass Recycling and Recovery (6)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Dko health, safety, and environmental requirements for the recovery of glass	3	core
Identify and sort glass for recycling as cullet	2	core
Identify and sort bottles for washing and reuse	2	core
Wash glass containers for reuse	2	elective
Demonstrate and awareness of machinery options and end uses associated with glass crushing, screening and grading for recycling. Safety and efficiently operate this plant.	4	specialist
Demonstrate an understanding of the markets and market / processing requirements for cullet, bottle and other reuse options.	5	specialist

**Functions/Roles in Reusable Goods (8)**

Areas where it is expected generic unit standards will apply include: cash management and reporting, communication, merchandise presentation, and conflict resolution. **This requires further follow up with specialist textile experts**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Receive, load for transport, repair, prepare, and price reusable goods	3	core
Demonstrate understanding of and negotiate prices for reusable goods Based on the types, condition, applications and associated issues	3	core
Demonstrate working knowledge of regulations for, and rights and responsibilities of, buyers and sellers of second hand goods	3	core
Plan/design, construct, and manage display areas for second hand goods	3	core
Demonstrate core knowledge of waste exchanges and source second hand goods and recovered resources for reuse and resale	3	core
Appraise and sort recovered textiles for resale, shredding, rags and other end uses.	3	specialist
Demonstrate an awareness of the machinery and processes relevant to textile recovery and reuse and associated safety issues and efficiently operate this plant.	3	specialist
Develop and implement a safety plan for testing and preparing second hand goods for resale. Includes standing instructions, labelling, disassembly/resource recovery	5	specialist

**Functions/Roles in Resource Recovery Education (12)**

Generic educational standards include: disability, H&S, cultural issues, learning, groups, contracts, financial management, teachers aid programmes.

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Plan and conduct site visits for resource recovery education Includes – a variety of resource recovery contexts, safety briefing, educational tours	4	core
Demonstrate an understanding of sources relevant to resource recovery, recycling and zero waste education - Includes access/download (and direct others in doing the same) physical and online educational information and resources	3	core
Prepare and communicate educational resources which explain the function and purpose of resource recovery sites and operations	4	core
Adapt and deliver teaching modules for resource recovery, recycling and zero waste in a primary school context - translate from a generic NZ context to a local setting	5	elective
Adapt and deliver teaching modules for resource recovery, recycling and zero waste in a secondary school context - translate from a generic NZ context to a local setting	5	elective
Adapt and deliver teaching modules for resource recovery, recycling and zero waste in a adult learning context - translate from a generic NZ context to a local setting	5	elective
Plan, prepare, and implement learning and demonstration activities based upon resource recovery, recycling and zero waste concepts in a primary school context.	5	elective
Plan, prepare, and implement learning and demonstration activities based upon resource recovery, recycling and zero waste concepts in a secondary school context.	5	elective
Plan, prepare, and implement learning and demonstration activities based upon resource recovery, recycling and zero waste concepts in an adult learning context.	5	elective
Train and supervise support staff working in resource recovery, recycling and zero waste environmental education programmes	5	specialist
Analyse requirements to support a resource recovery programme in an educational institution - Includes understanding of school management, policies, regulations and curriculum for a working relationship to support the school in its overarching function.	5	specialist
Apply and maintain a specific resource recovery programme in an educational institution e.g. Enviroschools, EERST, WasteBusters or other recognised programme	5	specialist

### Functions/Roles in Organic Resources Recovery (28)

The following functions link to the Australian organic recycling competency standards in Commercial Composting certificates II, III, IV, and the Diploma. In the NZ context we would probably have a Level 3 certificate for operators, a Level 4 for Supervisors, and a Level 5 for managers and technical specialists.

Generic multi sector skills and functions include : Vehicle and machinery servicing, general machinery operations (front end loader, excavator, forklift, trucks) weighbridge operations, soil and growing media properties, communication systems, plant nutrition, soil sampling/analysis, recruit personnel, train, lead and manage staff and work teams, prepare and operate within a budget framework, monitor and report on financial performance.

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of and implement health, safety, and environmental requirements for the recovery of organic materials Includes, contaminants, site emergency, property/structures maintenance, monitoring	3	core
Identify materials, production processes, and products in organic recycling operations	2	core
Induct visitors to a site safety plan and conduct educational site tours	3	core
Load, transport, and store organic materials.	3	core
Conduct sampling operations to collect and record quality control and production data	3	core
Set up and operate a irrigation system	3	core
Dispatch materials and compost products	3	core
Provide and communicate compost product information and related services to customers	2	core
Assess, receive, and sort raw materials (from the public) for organic recycling	2	elective
Operate an organics shredder for resource recovery	3	elective
Operate a screening plant in a organic recycling operation	3	elective
Operate an in vessel composting plant	3	elective
Prepare and manage aerobic composting windrows Monitor moisture, odour, leachate and (other issues)	3	elective
Operate windrow turning machinery	3	elective
Operate compost bagging processes and machinery	3	elective
Plan and schedule production of an organic recycling operation Develop and implement contingency planning and undertake a process audit in an organic recycling context	5	specialist

**Functions/Roles in Organic Resources Recovery continued**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Supervise and monitor health, safety, and environmental requirements for the recovery of organic materials (including effective work practices, on site emergencies –specific fire emergencies, maintenance of property and structures, maintain and monitor environmental work practices)	4	core
Develop composting recipes and manage batching and amendment procedures for an organic recycling operation. (Includes a range of inputs)	5	elective
Prepare value added compost products	3	elective
Monitor, review, and implement quality and environmental assurance procedures for an organic composting facility Includes – odour & nuisance management, compliance, production related data, analysis, and response.	5	specialist
Source and classify raw materials for organic recycling	5	specialist
Amend and prepare biosolids and sludges for treatment and use in organic recycling.	3	specialist
Provide and communicate compost product information and related services in a marketing context – Includes: complaints, conflict resolution, specialist advice	5	specialist
Demonstrate knowledge of the properties, applications and issues relating to the products from a organic recycling operation Includes – home gardening, sports-turf and agricultural / horticultural setting.	5	specialist
Develop product performance criteria, plan and communicate a marketing strategy and information.	5	specialist
Plan and develop an organic recycling production site Includes drop-off, processing, storage and sales areas.	5	specialist
Manage a research process relating to organic recycling e.g. a growth trial	5	specialist
Develop and implement contingency planning and undertake a process audit in an organic recycling context	5	specialist

**Specialist Bio-energy standards (3)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of grading requirements of organic materials used for bio-energy.	3	specialist
Operate systems for grading organic materials destined for bio-energy operations.	3	specialist
Supervise and manage a facility for processing organic materials for bio-energy	5	specialist

**Vermiculture standards (12)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of the biology of relevant worm species and their environmental requirements in a vermicomposting operation.	3	core
Demonstrate knowledge of domestic composting using worm farms Includes range of commercial and home made units that can be used to achieve this	3	core
Demonstrate knowledge of sourcing, preparing and feeding out organic material in vermicomposting operation	4	core
Explain, establish, and maintain worm beds – range of different types	4	core
Explain and demonstrate methodologies for separation of vermicast and its preparation for sale	4	core
Explain and demonstrate methodologies for separation, preparation, and packaging of worms and worm capsules for sale	4	core
Discuss issues and explain and demonstrate appropriate operational responses relevant to a vermicomposting operation. (heat, moisture, predators etc)	4	core
Explain properties, applications, and issues and prepare and communicate a marketing strategy for vermicompost products (worm tea, vermicast, worms)	4	core
Demonstrate knowledge of and safely operate and maintain specialist equipment used in a commercial vermicomposting operation	4	core
Demonstrate knowledge of and prepare value added products from a vermicomposting operation	3	elective
Plan, manage and report on the site and operation of a vermicomposting operation.	4	elective
Prepare teaching resources and conduct a demonstration of domestic worm farming for a small group	4	elective

**Functions/Roles in Recovery of Hazardous Commodities and Special Waste (18)**

Generic functions include: contracts, promotion, and networking

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Identify hazardous commodities and special waste for recycling or disposal	2	core
Demonstrate core knowledge of New Zealand legislation relating to recovery of hazardous commodities - Include HSNO, LTSA Rule 45001, NZS:5433, local bylaws.	2-3	core
Receive and contain hazardous materials at a collection site	2	core
Collect and contain hazardous materials for recovery	2	core
Explain safe methods for collecting and storing hazardous commodities. Includes theory, practice, risks, separation, packaging, labelling, domestic, private transport, drop-off, transfer station, agrichemicals	3	core
Explain safe methods for the collection and storage of special waste Includes, theory, best practice, container, labelling, preparation for transport	3	core
Demonstrate safe methods for collecting hazardous commodities - Containment, separation, preparation for transport. package label, unused agrichemicals	3	core
Operate an tyre shredder for solid waste disposal	2	elective
Explain recycling options for hazardous commodities and special waste	3	elective
Raise awareness of and promote a recovery and recycling programme for a hazardous commodity or special waste	5	elective
Demonstrate knowledge of waste oil collection and recycling operations Includes motor oil, food oil, grey water	3	special
Demonstrate knowledge of the handling and disassembly of electronic goods for resource recovery and recycling. Includes theory, issues and best practice	3	special
Demonstrate knowledge of sludge and biosolids collection and disposal	3	special
Demonstrate knowledge of legislative requirements for the recovery of hazardous commodities and special waste - regional, NZ, international, HSNO, Basel convention	5	special
Establish a temporary hazardous waste facility for public collection Includes plan, organise, manage and monitor, e.g. Hazmobile event	5	special
Design a commercial facility for collection and storage of hazardous waste	5	special
Manage a commercial facility for collection and storage of hazardous and special wastes	5	special
Demonstrate knowledge treatment methods for hazardous wastes – includes solidification, thermal, oxidation, neutralisation, reduction.	5	special

**Functions /Roles in Construction and Demolition (C&D) Waste Minimisation (11)**

There are some existing unit standards for demolition operations, so those that follow are developed to fill gaps and complete coverage from a resource recovery perspective

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Identify, de-nail, stack and prepare recyclable timber for transport	2	core
Demonstrate introductory knowledge of legislation relevant to construction and demolition waste.	2-3	core
Demonstrate knowledge of the recovery of construction and demolition resources	3	core
Demonstrate knowledge of health, safety and environmental requirements relating to the minimisation of construction and demolition waste	3	core
Remove, store, and prepare recyclable fixtures and fittings for transport	3	core
Recover aggregate from construction and demolition materials using a crusher	3	elective
Identify and sort construction and demolition waste	2	elective
Select and manage machinery systems in a demolition context	5	elective
Assess resources and recommend recovery strategies to minimise construction and demolition waste	4	specialist
Plan, implement, and monitor construction site waste minimisation and recycling	5	specialist
Develop tenders for contracts to minimise and recycle construction and demolition waste - Includes registration of interest, contract documents.	5	specialist

**Functions/Roles in Solid Waste Collection (5)**

These functions relate to collection and not to driving the refuse trucks. Generic units include manual handling.

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Demonstrate knowledge of health, safety, and environmental controls for solid waste collection	2	core
Explain health and personal fitness requirements for solid waste collectors	3	core
Collect standard domestic waste and kerbside recyclables	2	core
Deal with illegal dumping of solid waste	3	core
Plan & supervise commercial collection of resources and residual waste Includes bins and vehicles selection and optimisation of vehicle routes.	5	specialist

**Functions/Roles in Solid Waste Processing and Disposal (20)**

<i>Function or Role</i>	<i>Notional Level</i>	<i>Category</i>
Sort and contain residual solid waste for disposal	2	core
Demonstrate knowledge of disposal methods for residual waste	3	core
Demonstrate knowledge of landfill operations	2-3	core
Maintain and operate stormwater system at a landfill	3	core
Identify and isolate unacceptable solid waste	3	core
Demonstrate knowledge of landfill cell construction methods	3	core
Control pests at a landfill	2	elective
Maintain and operate ancillary facilities at a landfill (wheelwash, dust control)	2	elective
Operate a wheeled compactor at a landfill	3	elective
Operate a water tanker at a landfill site	3	elective
Spread daily covers at a landfill	3	elective
Maintain and operate a landfill leachate system	3	elective
Maintain a landfill gas extraction system	3	elective
Determine procedures for disposal of special waste	4	elective
Control waste disposal at a landfill tiphead	4	elective
Monitor environmental requirements at a landfill	4	elective
Control site traffic at a landfill (includes a cleanfill)	4	elective
Accept and reject solid waste for disposal – Includes screening C&D etc	4	elective
Manage landfill operations	4-5	specialist
Identify illegal solid waste disposal items and explain how to mitigate their effects on a landfill	4	specialist

## APPENDICES

### Appendix 1 What is a Scoping Report?

An initial investigation into the working parameters required before undertaking work related to the setting of standards and qualifications.

These parameters encompass identifying the key stakeholders of the standards and qualifications, and determining broad guidelines for the structure, organisation, and application of the standards and qualifications.

The information in a Scope Report provides a guide to the type of process required to analyse the area for which the standards and qualifications are to be developed.

### Outcomes of a Scope Report

A scope report can include any of the following:

- a definition of the project area, and the project boundaries – a ‘map’
- potential points of overlap within the industry
- potential points of overlap with other industries
- links with other areas or industries – pathways for training
- key stakeholders and players
- purpose and key functions/roles in the area under investigation
- notional levels of competency required within the project
- core, optional, and specialist areas
- sources of information
- matters relating to gender, religion, Te Tiriti etc
- overview of human resources, education, and training needs for the present and future
- priorities for unit standard development.

The Scoping Report will give an overview of the project, allowing the development of a plan which will result in the detail required to develop standards and qualifications.

## Appendix 2 Industry Contacts

This list is to be extended as advised by members of the Resource Recovery Sector Advisory Group

<i>Topic</i>	<i>Organisation</i>	<i>Contact Person</i>
Zero Waste	Zero Waste NZ Trust	Don Reisterer
Zero Waste Resource Efficiency	Business Care	Neil Absolom
ZeroWaste	Responsible Recovery	Graeme Norton
Zero Waste Resource Efficiency	Tong and Associates	Richard Tong
Zero Waste	Wipeoutwaste	Dominic Salmon
Zero Waste	WasteNot	Sunshine Yates Bruce Middleton
Zero Waste	CBEC	Cliff Colquhoun
Zero Waste	Xtreme Waste Raglan	Ric Thorpe
Zero Waste	Cleanstream	Gary Kelk
Zero Waste RR Education	Envision New Zealand Ltd	Julie Dickinson
R R Operations	Streetsmart	Graham Christian Geoff Hemm
R R Operations Resource efficiency	Fonterra	Spring Humphreys
R R Operations	Responsible Recovery	Bruce Emerson
RR Operations	Enviropaints	Peter Reid
Paper Recovery RR Education	Full Circle	Louisa Palmer
Paper Recovery	Paper Reclaim	Peter Thorne
Paper Recovery	Wellington Sorting & Baling	Steve Donnelly
Paper Recovery RR Operations	Albrites	Tim Coombes
Paper Recovery Glass Recycling Reusable Goods, RR Education	Recovered Materials Foundation	Richard Lloyd
Glass Recycling	Visy Glass	Peter
Reusable Goods	Xtreme Waste, Raglan	Susa Kupa
Reusable Goods	Mana Community Enterprises	Phil Hancock
Reusable Goods -Textiles	Various commercial operations and community groups such as Presbyterian support etc	???????
Reusable Goods RR Education	Recovered Materials Foundation	Sarah Gordon

<i>Topic</i>	<i>Organisation</i>	<i>Contact Person</i>
Whiteware Recycling	Fisher and Paykel NZ Ltd	George Gray
Plastics Recycling	Pacific Plastics Recyclers, Otaki	Jim Rimmer
Plastics Recycling	Rotoform Plastics	Gant Brumby
RR Education	UNITEC	Jeff Seadon
RR Education	Auckland Regional Council	Sandi Thomas
RR Education	WasteBusters Trust	Anita Coghill
RR Education	EERST	Bruce Trask Marty Hoffart
RR Education	Enviroschools	Julie Dennis
Organic RR	Perry Environmental Power organics	Kim Willoughby
Organic RR	Materials Processing Ltd	Peter Fredricson Lisa de Haan
Organic RR	Living Earth Ltd	George Fetjie
Organic RR	NZ Composting	Brendan Mahlia
Organic RR	Andar / Rotocom	Richard Borrie Steve Kroening
Organic RR	VCU	Paul Brown
Organic RR	Hot Rot	George Pottinger
Organic RR	WormsRus	Colin McPike
Organic RR anaerobic digestion),	University of Canterbury	Ian Mason
Organic RR Biosolids	MfE	Chris Purchas
Organic RR	IW Kaikoura	John Ransley
Organic RR	MfE /NZWWA	Charles Wilmot
Organic RR	Christchurch City Council	Tony Moore
Organic RR	Danielle Kennedy	North Shore CC
Organic RR	Jon Roscoe	Waitakere City
Organic RR	Living Earth	David Perkins Rod Gibbons
Hazardous Waste	Auckland Regional Council	Patricia Blutner
Hazardous Waste	Taranaki Regional Council	Maureen O'Rourke
Hazardous Waste	Tredi New Zealand	Boyne Drummond
Hazardous Waste	Nuplex Environmental	Manus Pretorius
Hazardous Waste	R&S McGregor	Ray McGregor
Hazardous & Special	Environment Canterbury	Darren Patterson

<i>Topic</i>	<i>Organisation</i>	<i>Contact Person</i>
Hazardous & Special	Hill Laboratories	Graham Corban
Hazardous & Special	R&S McGregor Ltd	Ray McGregor
Hazardous & Special	TREDI NZ Ltd	Boyne Drummond
Hazardous & Special	Enviropaints	Peter Reid
Hazardous & Special	URS	Rachael Larkin
Hazardous & Special	Molten Media	Dean Johnson
Hazardous & Special	Farm plastics project	Sandi Scarrow
Batteries	Waste Resource Trust	Anna McCallum
Computer recyclers	The ARK	Cory Dyer
Electronic waste	MfE	Simon Wilkinson
Oils	Salters Cartage	Ron Salter Dave Laing
Tyres	MfE	Alison Handley
C&D	Ward Demolition	
C&D	Materials Processing Ltd	Peter Fredrickson
C&D	Hamilton District Council REBRI Group	Sven Hanne
C&D	SKM REBRI Group	Pene Burns
C&D	BRANZ REBRI Group	Roman Jaques
C&D	North Shore City Council REBRI Group	Kevin Crutchley
C&D	Jurgen Contracting	Aaron Jurgen
Solid Waste Processing	H G Leach	Miljenko Pavlinic Eric Parkins
Solid Waste Processing	Waste Management NZ Ltd	Chris Northey
Solid Waste Processing	Redvale Landfill	Chris Wills
Solid Waste Collection	WAM	Grant Anderson
Solid Waste Collection	MetroWaste	Bruce Dean

### Appendix 3 Glossary

Bio-energy	Energy derived from renewable natural resources – solid (wood chips), gaseous (ethanol, biodiesel).
Biogas	A mixture of methane and carbon dioxide gases produced when anaerobic bacteria break down organic waste. Most commonly used to refer to gas produced at landfills and during waste water treatment.
Biosolids	A by-product of sewage collection and treatment that is reused as a soil conditioner.
BusinessCare	A programme of assessment and assistance to businesses to reduce materials, energy, emissions and waste.
CDL	Container Deposit Legislation
Cleaner production	Practices that reduce adverse environmental impacts by improving resource efficiency and reducing waste.
Cleanfill	Waste disposal site that accepts only inert wastes such as soil, concrete, and bricks.
Collection	A system of gathering, transporting and storing recyclable materials from diffuse sources for export from or processing at a centralised facility.
Compost	An organic product that has undergone controlled biological transformation to achieve pasteurisation and a specified level of maturity.
Construction and Demolition waste	Materials in the waste stream that arise from construction, refurbishment, or demolition processes. Often abbreviated as C&D waste.
Disposal	Final stage in the management of the waste stream.
Domestic waste	Component of the waste stream derived from households.
Extended Producer Responsibility	Places the onus on businesses to seek and implement opportunities for resource conservation and pollution prevention throughout the product's lifecycle including disposal. Abbreviated to EPR.
Fullcircle	Resource efficiency initiative of Carter Holt Harvey including paper collection and recycling, bio fuel energy, cleaner consumption, sustainable plantations, recycling of pre-consumer waste, and fibre recycling.
Green waste	Garden waste.
Hazardous waste	Materials that are flammable, explosive, oxidising, corrosive, toxic, ecotoxic, radioactive or infectious. Examples include unused agrichemicals, solvents, cleaning fluids, and medical waste.
Kerbside Recycling	Formalised kerbside collection system whereby the generator separates recyclables from waste and places them in containers for separate collection.
Landfill	An area used for the controlled disposal of solid waste.

Lifeafterwaste	A programme to close the loop on waste by changing the way people and institutions act resulting in a resource efficient and sustainable New Zealand.
Organic waste	Includes garden and kitchen waste, food process wastes, animal manures, and sewage sludge.
Packaging Accord	New Zealand Packaging Accord 2004-2009. A voluntary industry and government initiative to make more sustainable use of packaging.
Putrescible	Component of the waste stream liable to become putrid. Usually applies to food and animal products.
REBRI	Resource Efficiency in the Building and Related Industries. Collaborative initiative involving MfE Auckland councils, industry, and BRANZ to promote and assist resource efficiency in building and related industries. Extended nationwide in 2003 to reduce C&D waste at landfills and cleanfills.
Recycle	Process for converting recovered materials, that would otherwise be disposed of as wastes, into useful materials or products
Residual waste	The part of the waste stream that remains after recyclable materials have been removed.
Resource recovery	Process that extracts material or energy from the waste stream.
Resource recovery centre	Facility where goods and recyclable materials are received, processed, repaired, dismantled, and/or resold.
Sewage sludge	A by-product of sewage collection and treatment processes.
Screening	Process of passing material through a screen to remove objects and improve the consistency and quality of the end product. Examples of use include composting, and scrap metals.
Sludges	Semi-liquid waste produced as a by-product of an industrial process.
Solid waste	All waste generated as a solid or converted to a solid for disposal. It includes paper, plastic, glass, metal, electronic goods, furnishings, garden and other organic wastes.
Special waste	Wastes that cause particular management and/or disposal problems and need special care. Examples include used oil, tyres, end-of-life vehicles, batteries, and electronic goods
Stormwater	Results from rainwater runoff that is channelled through drains from roads and urban properties into waterways and the sea.
Trade waste	Liquid wastes generated by business and disposed of through the sewerage system. It includes a range of hazardous material resulting from industrial and manufacturing processes.

Transfer station	Facility that receives materials from the waste stream for resource recovery, treatment or disposal. On-site processed may include segregation, consolidation, or compaction for bulk transport.
Used oil	Oil contaminated through use with substances that can be hazardous to human health and the environment.
Vermicast	Solid organic material resulting from the biological transformation of compostable organic materials in a controlled vermiculture process.
Vermiculture	System of stabilising organic materials under controlled conditions by specific worm species and microorganisms using windrows, stackable trays, batch-flow, or continuous flow systems. Also known as worm farming.
Waste minimisation	Refers inclusively to all activities aimed at preventing, reducing, re-using, or recycling waste.
Waste stream	Flow of materials from a point of generation to ultimate disposal. Components may be diverted from this stream for resource recovery.
Zero Waste	A whole-system approach to addressing society's unsustainable resource flows. Encompasses the goal of maximum resource efficiency by targeting waste elimination through eco / sustainable design and production, extended producer, consumer and community responsibility and excellence in resource recovery and recycling technology and operations.

**Appendix 4 Suggestion for Proposed Qualifications**

