



Careers in Waste Management

Current Job Trends and Future Growth

September 2017



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ECO Canada

ECO Canada develops programs that help individuals build meaningful environmental careers, provides employers with resources to find and keep the best environmental practitioners and informs educators and governments of employment trends to ensure the ongoing prosperity of Canada's growing environmental sector.

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Foreword

Waste management has an integral role to play in everyday Canadian life, for individuals and businesses. Growing emphasis on waste reduction, environmental protection and sustainability, in both the private and public realms, is driving a need for waste management services and expertise. Activities related to waste management are performed in most sectors of the economy and involve employees who are specialized in a variety of different roles and occupations.

The waste management sub-sector deals with handling both hazardous and non-hazardous waste and the development of legislation and/or guidelines, regulations and standards. Individuals who do this work develop environmental policy, regulate safety training and are involved in the collection, diversion and/or disposal of hazardous and non-hazardous waste.



Canadian Waste Management Labour Force

Size

Occupations in waste management make up a large portion of the environmental labour force in Canada.

ECO Canada estimates that 602,500 Canadian workers require waste management skills to some level, whether as a primary job requirement or only to a minor degree. An estimated 129,074 of them fill core waste management jobs, which require specialized waste management skills and training.

Figure 1: Waste Management Skills and Core Occupations in Canada*



Functions

The scope of waste management work is wide.

- » Waste management planning
- » Waste streams audits
- » Landfill design
- » Leachate control
- » Methane control systems
- » Design of collections systems
- » Management protocols
- » Waste handling
- » Programs for management of hazardous and non-hazardous wastes
- » Policies and procedures for waste management
- » Coordination of reduction and reuse programs
- » Life cycle assessment
- » The monitoring and reduction of environmental impacts directly related to waste management and disposal

*Source: ECO Canada Profile of Canadian Environmental Employment 2013, 2012-2014 Environmental Job Vacancy Database,

Occupations

Waste management labour force can be divided into 14 occupation categories based on National Occupational Classification (NOC) codes.

Figure 2: Waste Management Core Labour Force by Occupational Category



Source: 2012-2014 Environmental Job Vacancy Database. Employment numbers extrapolated using the 2011 National Household Survey.

Core Waste Management Workers in Key Industries

This report focuses on **six key waste management** industries defined by the North American Industrial Classification System (NAICS). These industries were chosen for their high proportion of core waste management occupations, and the majority of waste management employees in these industries spend most of their time focused on waste management.

Figure 3: Six Key Waste Management Industries



Size

Within the six key industries, ECO Canada estimates that 40,000 workers require waste management skills to some level, whether as a primary job requirement or only to a minor degree. An estimated 32,602 of them fill core waste management jobs, which require specialized waste management skills and training.

Figure 4: Waste Management Skills and Core Jobs in Key Industries



*Source: 2015 Survey of Waste Management Employers, n=100, extrapolation to 2011 National Household Survey.

Table 1: Estimates of the Total Waste Management Workforce in Canada for Key Industries

NAICS	Industry	All Waste Management Employees		
		Est. Total	Est. Total	Percentage of Workers
9139	Local, municipal and regional services	10,561	9,654	91%
418110	Recyclable materials wholesalers	7,582	6,448	85%
562	Waste management and remediation	17,239	14,384	83%
237/238	Engineering construction	1,605	803	50%
541620	Environmental consulting services	2,328	995	43%
541330	Engineering services	769	319	41%
TOTAL		40,084	32,603	81%

Source: 2015 Labour Force Survey (LFS), Statistic Canada and 2015 Survey of Waste Management Employers, n=100.

Occupations & Job Titles

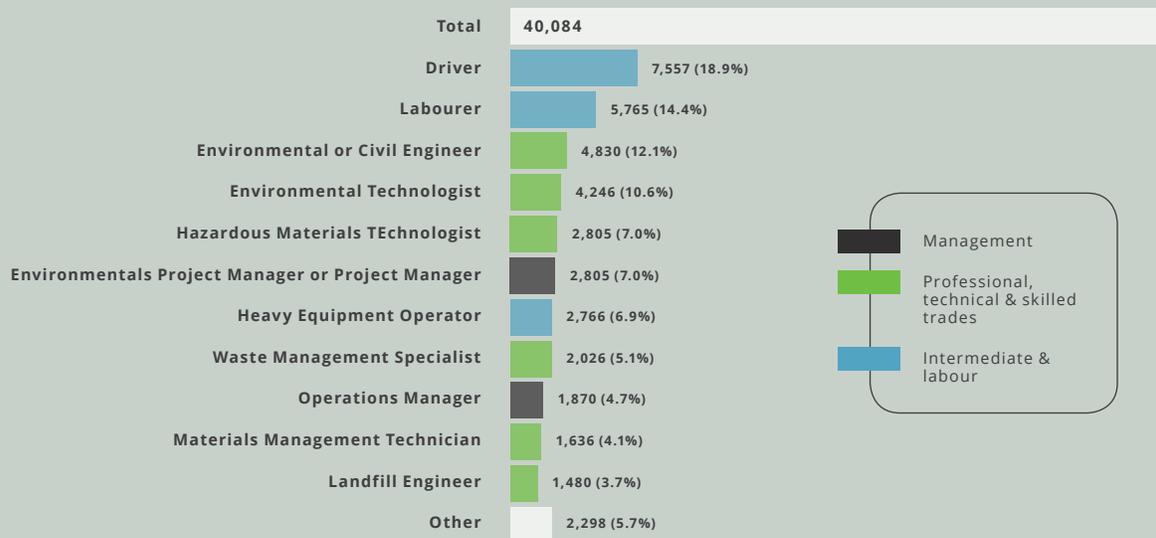
The jobs within waste management are broad and many are multi-disciplinary. Waste management workers may have vastly different skill sets and backgrounds. These workers can be divided into the following occupational categories:

- » **Management,**
- » **Professional, technical & skilled trades occupations, such as:**
 - » Engineers
 - » Technologists
 - » Specialists
- » **Intermediate & labour such as:**
 - » Drivers in waste management
 - » Labourers with waste management skills
 - » Heavy equipment operators

Job Titles

Waste management is a diverse subset of environmental employment, with a range of different job titles requiring varied levels of education and a broad range of skills. According to the employers surveyed, the most common job titles are driver and labourer.

Figure 5: Estimated Size of Waste Management Workforce in Key Industries by Common Job Title



Competencies & Skills

The competencies and skills that waste management employers seek reflect the diverse nature of waste management employment. One major skill requirement, common to all core waste management workers regardless of their background, is that **they must know the policies and regulations that affect waste management and must be able to apply and communicate them.** Other competencies and skills needed depend on the type of occupation.

Employers were asked to examine competencies relevant to waste management from the [National Occupational Standards \(NOS\) for Environmental Employment](#). The competencies most used by workers are also those for which employers suggested their employees require more professional development. The key competency categories follow.

Table 2: Top Competency Categories for Waste Management

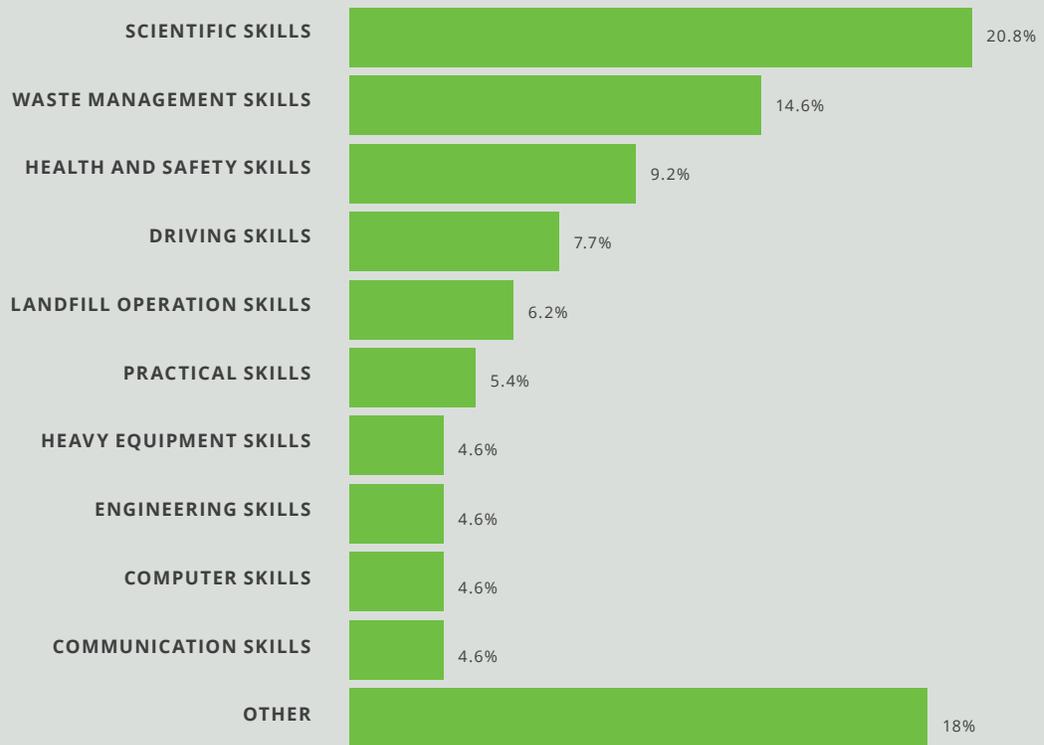
	Competency Category	Skills Used by Workers	Skills Where Workers Could Benefit from More PD
1	Interpreting, enforcing and complying with environmental regulations and environmental or sustainability standards.	86%	66%
2	Developing and implementing waste management plans and programs.	67%	30%
3	Monitoring waste application, disposal, reduction programs and activities	64%	48%
4	Collecting samples and data for environmental purposes.	56%	36%
5	Implementing pollution prevention, abatement & control (PAC) methods.	48%	34%
6	Developing environmental sampling, testing and monitoring programs.	47%	35%

Source: 2015 Survey of Waste Management Employers, n=100. Percentages for 'skills where workers could benefit from more PD' are based on total employer responses.

Employers also identified technical knowledge and skills that they believe their employees need to know more about. The top three were:

- Scientific skills that include environmental science, biology, geology and chemistry
- Skills in waste management
- Health and safety skills

Figure 6: Most Commonly Sought Technical Skills in Waste Management



Source: 2015 Survey of Waste Management Employers, n=100. Question asked employers to select up to three technical skills areas. Percentages calculated based on total valid responses.

For desirable soft skills, employers stressed the importance of communication, writing and public relations skills and being able to disseminate information in a manner that is easily digestible and meets the needs of stakeholders. Problem solving was also mentioned as an important skill that cross-cuts many different occupations. Other useful skills include: willingness to learn, customer service, government and politics, people skills, human resources, administration and management.

Career Pathways & Education

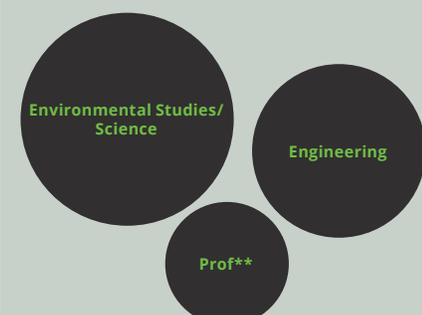
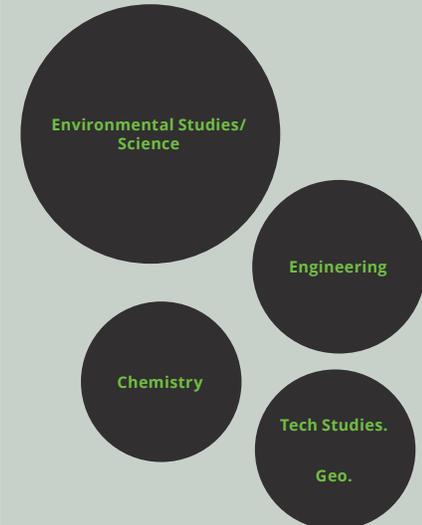
In-depth analysis of six key waste management industries in Canada reveals a diverse area of employment where professionals can draw on their practical experience and backgrounds to follow several non-linear career paths to become specialized in waste management.

Careers in waste management span all occupational segments, where movement from lower skilled occupations to more scientific/technical occupations is frequent but usually accompanied by more education.

- The most experienced positions can be found in management occupations and the most common educational backgrounds include environmental science, engineering, chemistry, as well as different technological, business, and communications backgrounds.
- Professional, technical & skilled trades workers typically require at least a college-level education or apprenticeship and are primarily educated in environmental studies/science and engineering; however, they also have backgrounds in other science-based areas such as chemistry and geology, as well as in technological studies .
- Intermediate or labour workers are primarily drivers, labourers, and heavy equipment operators who do not usually have any formal education but generally do have a valid driver's licence and on-the-job training that results in special certificates (e.g. Transportation of Dangerous Goods, WHMIS, Ground Disturbance Levels 1 and 2, among others).



Table 3: Educational Background for Waste Management Occupations by Skill Levels

	Common Job Titles	Educational Backgrounds*	Level Of Experience
Management	Corporate Environmental Specialist		More 
	Environmental Consulting Manager		
	Environmental Coordinator		
	Environmental Project Manager		
	Operations Manager		
	Recycling Coordinator		
	Director		
Professional, Technical & Skilled Trades	Biotechnologist		
	Chemical Engineer		
	Chemical Technologist		
	Civil Engineer		
	Environmental Engineer		
	Environmental Technologist		
	Geo-Technologist		
	Hazardous Material Technologist		
	Waste Management Specialist		
	Scientist		
	Safety Officer		
Intermediate & Labour	Driver		Less
	Heavy Equipment Operator		
	Labourer		
	Other		

Source: 2015 Survey of Waste Management Employers, n=100; In-depth interviews with Waste Management experts. *Size of circles represent the prevalence of a particular educational background relative to the others shown in each skill category.**Professional (Prof.) educational backgrounds include, but may not be limited to: communications, commerce, business, administration, management, and marketing.

Figure 7: Career Pathways in Waste Management

Stream 1: Management, Professional, Technical or Skilled Trades Positions

How to read this chart:

The horizontal lines show the experience typically needed to start on that position. Example: a person can start as a Hazardous Materials Technologist with less than 1 year experience. That same person can become a Waste Management Specialist after 8 or more years' experience.

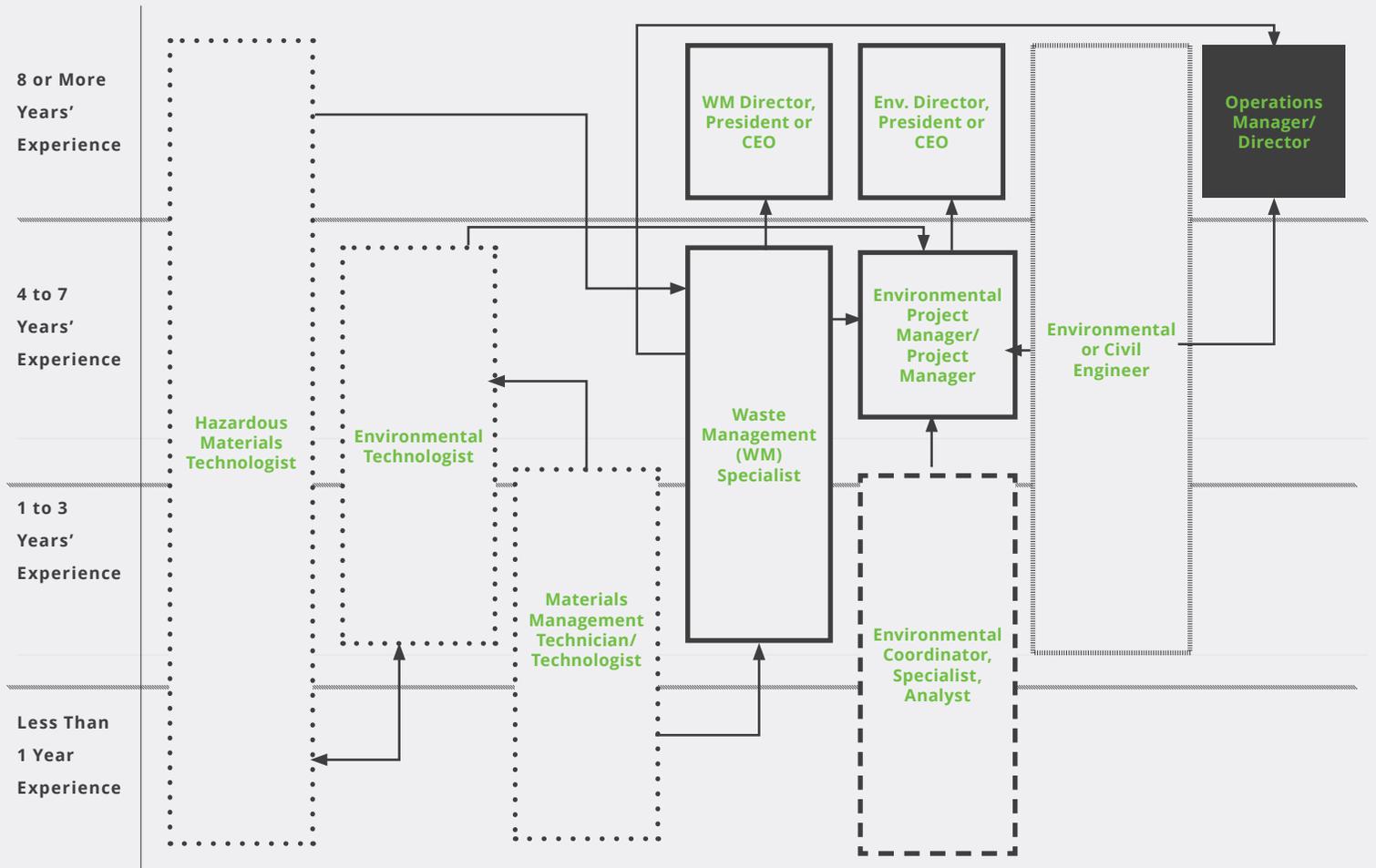
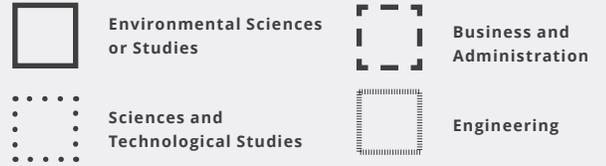
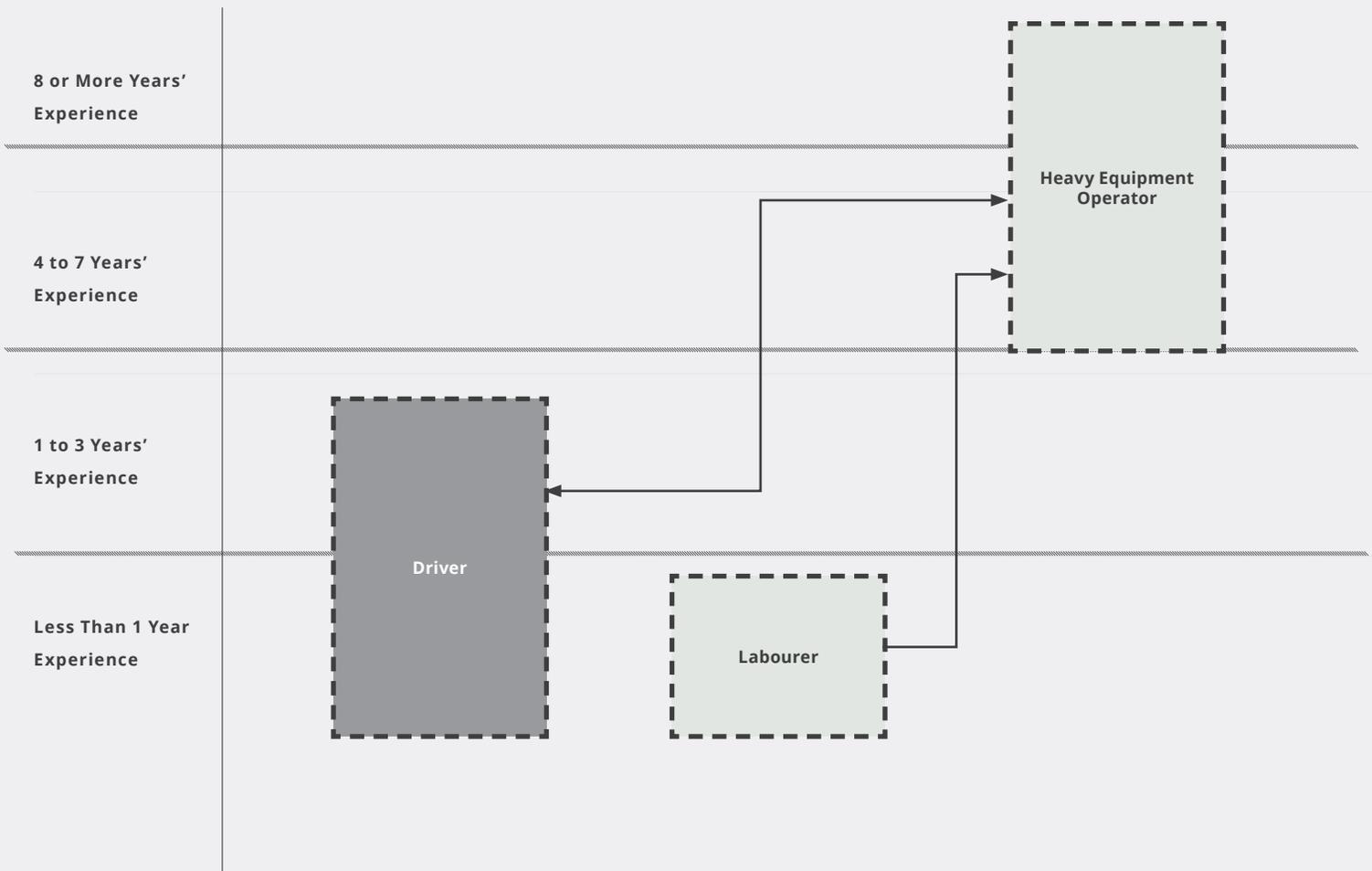


Figure 7.1 Career Pathways in Waste Management

Stream 2: Intermediate or Labour Positions

How to read this chart:

1. The horizontal lines show the experience typically needed to start on that position.
2. Moving from Stream 2 to Stream 1 typically takes higher education/training.



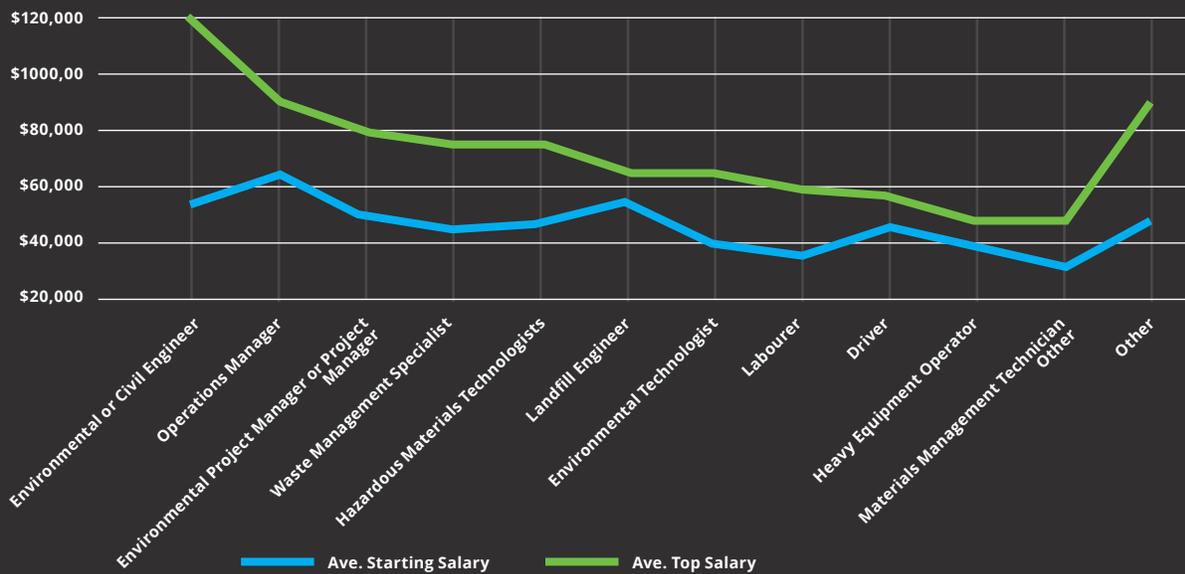
Earnings

When choosing a career in waste management, a person can expect an average starting salary of \$45,290 and an average top salary of \$73,168 (2015 dollars). The average starting and top salaries for waste management employees are similar across key industries, but vary significantly depending on occupation.

The occupations with the highest average salaries are those that belong to the management skill category or to professional, technical or skilled trades. These are also the occupations that tend to have the highest variation between starting and top salary. Environmental or civil engineers, for instance, could see as much as a 54% increase in their salary over time as they become more experienced.

Occupations within the intermediate or labour skill category, such as driver or heavy equipment operator, tend to have lower average starting and top salaries. Also, the variation between the starting and the top salaries is more modest. For example, drivers may only see a 24% increase in their salary over time.

Figure 8: Starting and Top Salaries (averaged across key industries)



Source: 2015 Survey of Waste Management Employers, N=100. Job titles with less than 4 responses were excluded from this table.

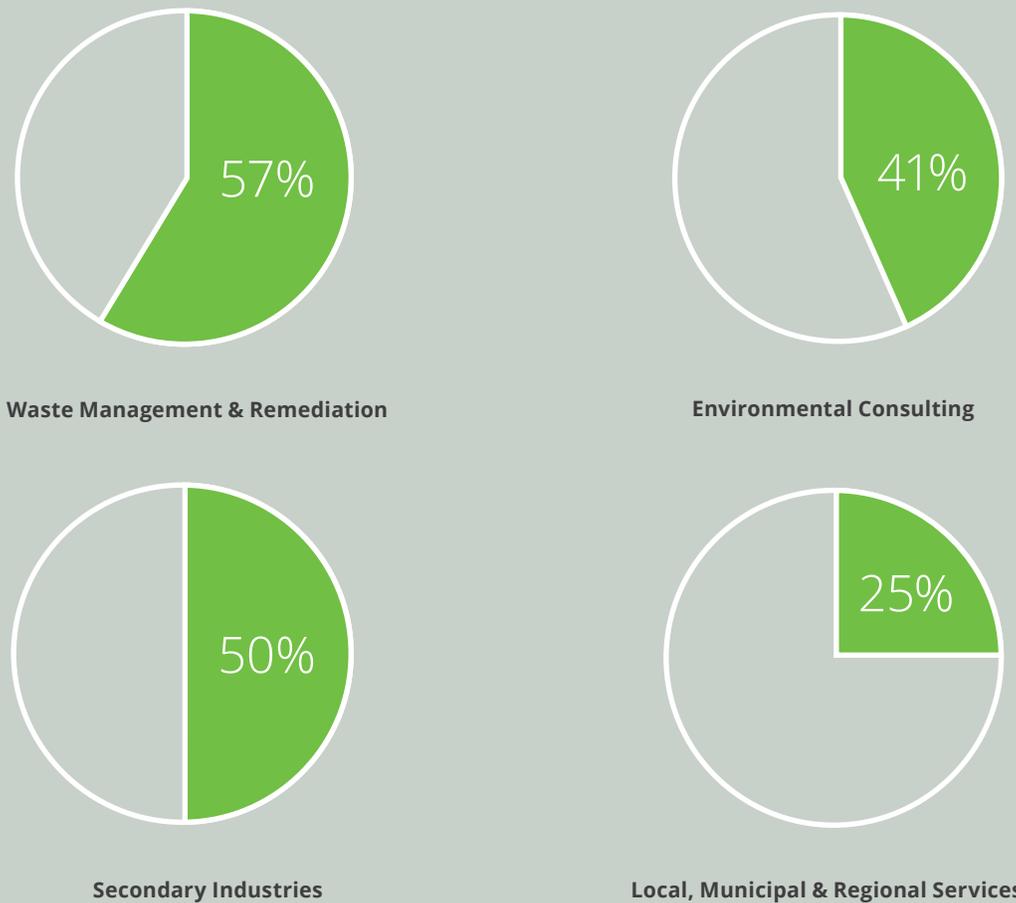
Hiring & Retention

There is reason to believe that demand for waste management employees may exceed the current supply.

16% of employers surveyed report having unfilled positions in waste management. The secondary industries (i.e., recyclable materials wholesalers, engineering construction, engineering services) are the most in need of workers, with a quarter of these employers reporting unfilled positions. Part of the reason for this may be the high number of “intermediate or labour occupations” which often have high turnover in the secondary industries.

45% of employers claim to have experienced difficulties in recruiting qualified staff. The most common recruitment difficulty cited is a lack of qualified candidates.

Figure 9: Proportion of Employers Citing Hiring Difficulties by Key Industry

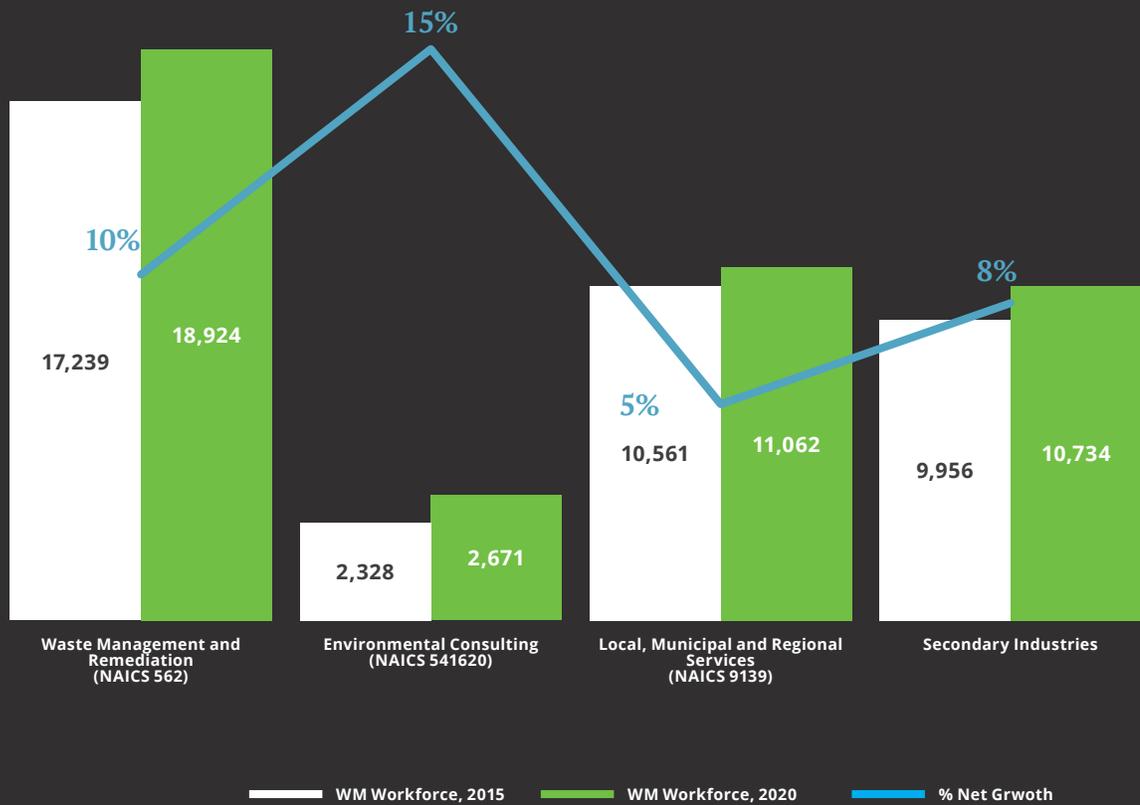


Source: 2015 Survey of Waste Management Employers, N=100.

The future employment outlook for waste management is bright. It is estimated, based on 2015 survey data, that there will be a 10% total net growth in waste management employment for key industries by the year 2020. This could mean over 4,000 new jobs in waste management.

The greatest number of new jobs are expected to be in the waste management and remediation industry (1,865 positions). Environmental consulting will have the fewest new waste management positions (only 343 of them), but total net employment growth will be the highest of all key industries, at 15%.

Figure 10: Forecasted New Growth of the Waste Management Workforce in Key Industries by 2020



Source: 2015 Survey of Waste Management Employers, n=100.

Trends

Waste Management experts give a unique insider point-of-view on some of the trends affecting employment. Public concern over pollution and health, increasingly stringent legislative requirements, renewed focus on workplace safety and more focus on municipal “greening” are factors driving growth in employment for waste management.

Several factors may affect the future demand for waste management professionals in Canada. Public concern over pollution, climate change, workplace safety and public health have supported the creation of new waste regulations that, in turn, create more demand for waste management.

The greatest driver of employment growth has been environmental policy and regulation. Being informed about legislation at all levels of government is an essential part of doing business. Changes in technology also drive employment; however, the demands are sector/industry specific (e.g. changes to the transport of oil or composting methods).

Figure 11: Trends Influencing Employment in Waste Management

Trend		Type of Trend
↗	Public concern over climate change, pollution and health	Structural; Long-term
↗	Ligislative requirements on types and size of pollutants being monitored	Future; Long-term
↗	Increasingly stingent regulation of workplace safety	Structural; Long-term
↗	Increasing municipal focus on green cities	New; Long-term
→	Economic growth	Cyclical
→	Resource extraction industry	Cyclical
↘	Technological developments	Structural; Long-term

Source: In-depth interviews with waste management experts.

Experts noted three additional important trends that are affecting waste management employment, which include:

- **Municipal Focus on Green Cities.** A new driver of waste management employment may be linked to an increasing emphasis from municipalities to “green their cities.” This may include the implementation of recycling and/or composting programs.
- **Economic Trends and the Resource Extraction Industry.** Economic trends play a role in the demand for waste management workers. When economic conditions are positive, industries expand, creating more demand for workers. Experts suggest that waste management is linked with the oil and gas and mining industries. There are many establishments that manage the solid waste generated during resource extraction. As the oil and gas and mining industries ebb and flow, so will, to some measurable extent, waste management employment.
- **Technological Developments.** Changes in technology will also impact the demand for certain occupations and the skill sets that employers ask for. Automation and mechanization have reduced the need for some staff; however, higher-level skill sets may be required for positions related to developments in information technology.





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