



DIRTY AND DANGEROUS

Worker Safety and Health in
New York City's
Scofflaw Commercial
Waste Industry



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About the New York Committee for Occupational Safety and Health (NYCOSH)

NYCOSH is a membership organization of workers, unions, community-based organizations, workers' rights activists, and health and safety professionals. NYCOSH uses training, education, and advocacy to improve health and safety conditions in our workplaces, our communities, and our environment. Founded in 1979 on the principle that workplace injuries, illnesses and deaths are preventable, NYCOSH works to extend and defend every person's right to a safe and healthy workplace.

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DEDICATION

THIS NYCOSH REPORT is dedicated to the struggle of Memphis sanitation workers, whose 1968 strike was a crucial landmark in the civil rights and labor movements.

On February 1, 1968, two Memphis garbage collectors, Echol Cole and Robert Walker, were crushed to death by a malfunctioning truck. Twelve days later, frustrated by the city's lack of response to the workplace deaths and to a long pattern of neglect and abuse of its black employees, 1,300 black men from the Memphis Department of Public Works went on strike. Sanitation workers, led by garbage-collector-turned-union-organizer T. O. Jones, demanded better safety standards, a decent wage, and recognition of their union, Local 1733 of the American Federation of State, County, and Municipal Employees. Despite organizing city-wide boycotts, sit-ins, and daily marches, the workers were initially unable to secure concessions from city officials.

National civil rights leaders, including Roy Wilkins, Bayard Rustin, James Bevel, and Ralph Abernathy, came to Memphis to support the sanitation workers. Martin Luther King Jr. arrived on March 18 to address a crowd of about 25,000 – the largest indoor gathering the civil rights movement had ever seen. On March 29 over five thousand demonstrators, carrying signs which read "I Am A Man," participated in a march led by Dr. King. On April 3, 1968, nearly two months after the start of the strike, Dr. King returned to Memphis and delivered what would be his last public speech. The following evening King was assassinated on the second-floor balcony of the Lorraine Motel. In the wake of King's death, President Lyndon B. Johnson sent James Reynolds, undersecretary of labor, to Memphis to help resolve the strike. On April 16, the Memphis sanitation workers' strike ended when the city agreed to issue raises to African American employees and to recognize the union.

Excerpted from:

Digital Library of Georgia, Civil Rights Digital Library. 2013. http://crdl.usg.edu/events/memphis_sanitation_strike/?Welcome. Accessed March 22, 2016.

Stanford University, Martin Luther King, Jr. Research and Education Institute. No date. Memphis Sanitation Workers Strike (1968). http://kingencyclopedia.stanford.edu/encyclopedia/encyclopedia/enc_memphis_sanitation_workers_strike_1968/. Accessed March 22, 2016.

GLOSSARY

ANSI	American National Standards Institute
BBP	Bloodborne Pathogens
BIC	Business Integrity Commission
dB	Decibels
DOB	Department of Buildings
DSNY	New York City Department of Sanitation
EPA	Environmental Protection Agency
FLSA	Fair Labor Standards Act
FMCSA	Federal Motor Carrier Safety Administration
H ₂ S	Hydrogen sulfide
HPD	Hearing protective device
IBT	International Brotherhood of Teamsters
LIUNA	Laborers International Union of North America
MRF	Materials recovery facility
MSW	Municipal solid waste
NIHL	Noise-induced hearing loss
NIOSH	National Institute for Occupational Safety and Health
NYC	New York City
NYCOSH	New York Committee for Occupational Safety and Health
NYS DOL	New York State Department of Labor
OSHA	Occupational Safety and Health Act or Occupational Safety and Health Administration
PEL	Permissible exposure limit
PPE	Personal protective equipment
SWANA	Solid Waste Association of North America
ULSD	Ultra low sulfur diesel

EXECUTIVE SUMMARY

WORKERS WHO COLLECT, transport, sort, and transfer residential and commercial waste for recycling or disposal perform an essential public health service, often at great risk of injury, illness, or death. Waste collection work is one of the most dangerous jobs in the U.S. Waste workers are ten times more likely to be killed on the job than the average worker and two and a half times more likely to be injured than miners. Nationally, occupational fatalities in private sector solid waste collection are consistently higher than those in local government sanitation agencies; 85% of fatalities in the industry occur in the private sector.

Although organized crime no longer dominates New York City's private sector waste trade, some commercial waste operators continue to routinely violate legal requirements with impunity, particularly with regard to occupational safety and health and with regard to wage and hour issues. These licensed businesses fail to provide the safe working conditions, practices, training, equipment, and oversight that are required by law, that are recommended by industry associations, and that are technically and economically feasible. Through their ongoing inaction and noncompliance, these employers directly cause unnecessary and avoidable employee injury, illness, and death. The resulting injuries, illnesses, and fatalities are not inevitable; there are known and effective methods for preventing, eliminating, or reducing these hazards and exposures.

Many of these same employers continue to violate wage and hour legal requirements, engaging in various forms of wage theft by not providing payment or overtime for all hours worked, by paying individual workers varying rates of pay, and by pressuring employees to work through unpaid meal breaks.

This report includes 8 case studies that highlight recent egregious incidents in commercial waste operations in New York City that resulted in fatalities, chemical exposures, and an amputation. In each of these cases, the employer failed to implement required or recommended feasible and proactive measures to prevent, eliminate, or reduce the hazardous conditions that directly caused these workers' deaths or injuries.

NYC commercial waste employers continue to violate OSHA requirements and to ignore industry health and safety standards, free from significant consequence for their actions or inaction. Their workers and contractors, however, are not free from consequence. They continue to be unnecessarily and avoidably injured, maimed, and killed on the job due to the persistent indifference of these scofflaw employers.

The jurisdictional patchwork and lack of coordination among responsible governmental agencies means that although citations can be and are issued, illegal and hazardous conditions and practices continue. Organized crime in the commercial waste industry has been eradicated; disorganized crime persists.

NYCOSH found:

- Municipal solid waste collection, treatment, and disposal is dangerous work, with high rates of injuries and fatalities. Virtually all of these injuries and fatalities are preventable and avoidable.
- NYC's municipal solid waste (garbage) is split into two separate waste streams – residential and commercial. Residential waste is collected by the New York City Department of Sanitation (DSNY), with a unionized workforce. Commercial waste (wastes generated by commercial enterprises) is collected by for-profit licensed carters. Union density in this sector is low.

- Commercial waste collection, treatment, and disposal operations tend to be less safe when conducted by commercial operators than when conducted by local government agencies. In NYC, commercial waste collection, treatment, and disposal operations tend to be less safe when conducted by small commercial operators than when conducted by larger commercial operators.
- Commercial waste operators, particularly some small non-union commercial waste operators, routinely violate OSHA requirements and wage and hour laws.
- In virtually every workplace fatality identified by NYCOSH, OSHA found safety violations that contributed to the fatality.
- Commercial waste operations that routinely endanger workers may also endanger public health through the same unsafe equipment and activities.
- The hazards to worker health and to public health originating in the commercial waste industry are known hazards that can be prevented or controlled.
- Commercial waste operations that have a record of fatalities, serious injuries, or serious OSHA violations are allowed to continue in business and have their licenses and permits renewed free from significant consequence for their actions or inaction.

SUMMARY OF POLICY RECOMMENDATIONS FOR NEW YORK CITY

- Make protection of worker health and protection of the public health integral components of the ongoing oversight process and of any reform efforts.
- Initiate criminal prosecution of waste operators where evidence indicates that one or more fatalities was caused by purposeful disregard of a legal requirement or by employer action with plain indifference to employee safety.
- Establish an interagency working group to share information and coordinate actions on complaints, conditions, violations, and enforcement in the commercial waste sector.
- As a condition of licensing or franchising or other administrative restructuring, require applicants to:
 - Certify that they comply with applicable OSHA standards
 - Certify that they comply with applicable ANSI consensus standards
 - Certify that they comply with NYS DOL wage and hours laws, specifically with regard to hours of work, overtime, meal periods, and wage statements
 - Submit records of health and safety training provided to management and non-management employees.
- Require that all compacting waste collection vehicles be equipped with a neutral position interlock to prevent the vehicle transmission from engaging in drive during compacting operations.
- Remove riding steps and prohibit riding on the exterior of waste collection vehicles. Require that waste collection vehicles be equipped with sufficient legal seats and seat belts to accommodate the collection crew.
- Require employers to provide flushable toilets, hot and cold running water, soap, showers, and locker rooms at work locations where employees begin or end their shift.
- Conduct a public education campaign to encourage commercial and residential waste generators to practice source separation.
- Protect and improve the jobs and standard of living of waste trade workers. Affirm and protect the right of workers to join unions and the legal obligation of employers to engage in collective bargaining with unions.

SUMMARY OF REQUIREMENTS AND RECOMMENDED BEST PRACTICES FOR EMPLOYERS

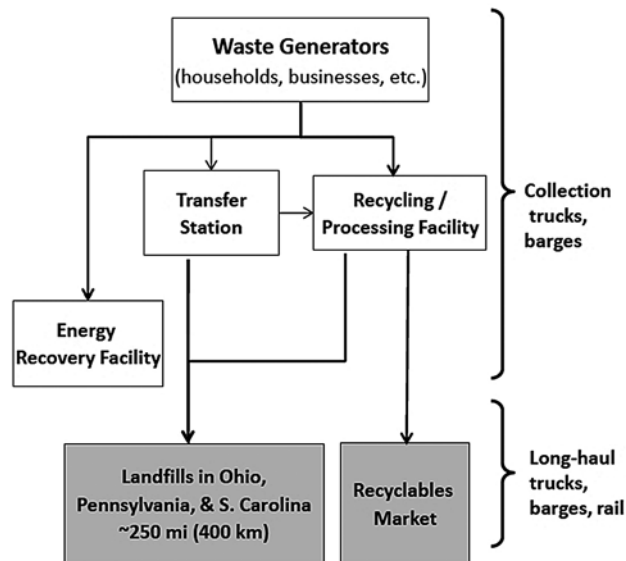
- Comply with wage and hour laws. Provide proper pay for hours worked, including overtime. Provide pay stubs with all required information. Provide required meal breaks.
- Conduct hazard assessments in workplaces. Identify and eliminate hazards, where feasible. Where hazard controls are not feasible or adequate, implement safe work procedures and provide appropriate personal protective equipment, at no cost to workers.
- Provide health and safety training to workers, in a language and at a literacy level they can understand.
- Establish exposure control plans for workers exposed to blood and other body fluids.
- Provide adequate local exhaust ventilation and general ventilation to protect workers against exposure to chemical and biological contaminants and to prevent odor and contaminant exfiltration to the exterior.
- Eliminate or reduce potential sources of noise by substituting quieter processes, parts, and equipment.
- Equip waste collection trucks with automatic neutral interlocks to prevent them from accidentally engaging the transmission in drive mode during compacting operations.
- Equip on- and off-road vehicles with closed-circuit television systems ("back-up cams") to monitor the blind spot behind the vehicle.
- Reduce diesel emissions by substituting a cleaner energy source, where feasible.
- Limit extended work shifts.
- Provide effective access to toilets, wash facilities, showers, and potable drinking water.

INTRODUCTION

HUMAN RESIDENTIAL and commercial activities generate large quantities of wastes. Workers who collect, transport, sort, and transfer these wastes for recycling or disposal perform an essential public health service, often at great risk of injury, illness, or death.

Municipal solid waste (MSW) consists of wet and dry solid waste, including putrescible waste,¹ generated by both residential and commercial sources. From 1881 until the middle of the twentieth century, the New York City Department of Sanitation (DSNY) was responsible for the collection and disposal of all MSW generated in the city.

In 1957, the collection and disposal of MSW generated by commercial sources was privatized, resulting in the emergence of two parallel but disparate industries. DSNY retained responsibility for residential waste while a chaotic, competitive for-profit private sector arose to handle the collection and disposal of commercial waste.² The Gambino and Genovese organized crime families rapidly came to dominate these enterprises and their trade associations and unions, and continued to do so for decades. The 1995 indictments of 17 individuals and 23 carting companies on enterprise corruption and criminal antitrust charges and the freezing of their assets by New York State marked the beginning of the end of mob domination of the industry. The Trade Waste Commission, established by New York City (NYC) in 1996 and replaced in 2001 by the Organized Crime Commission and then by the Business Integrity Commission (BIC) in 2002, completed the purge of organized crime from the city's commercial waste industry.



1 Putrescible waste means solid waste that contains organic matter, such as food waste, that decomposes relatively quickly.

2 Commercial solid waste means all types of solid wastes generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential and industrial wastes and regulated wastes such as medical waste and hazardous wastes like asbestos.

THE FALL OF ORGANIZED CRIME, THE RISE OF DISORGANIZED CRIME

ALTHOUGH LARGE-SCALE organized criminal enterprise has been successfully eliminated, some licensed haulers of commercial waste and some operators of waste transfer stations³ and materials recycling facilities (MRFs)⁴ continue to routinely violate legal requirements with impunity, particularly with regard to occupational safety and health. These licensed “low-road” non-union⁵ businesses fail to provide the safe working conditions, practices, training, equipment, and oversight that are required by law,⁶ that are recommended by industry associations, and that are technically and economically feasible. Through their ongoing inaction and noncompliance, these employers directly cause unnecessary and avoidable employee injury, illness, and death. In addition, the same employers continue to violate wage and hour legal requirements, engaging in various forms of wage theft by not providing payment for all hours worked, by paying individual workers varying rates of pay, and by pressuring employees to work through unpaid meal breaks.

Although NYC residential and commercial waste operations are organizationally distinct, their core functions, processes, materials, and equipment remain virtually identical. Excluding construction and demolition and fill waste, commercial waste comprises 45% of NYC’s municipal solid waste while residential waste comprises 55%. (1) The composition of each waste stream is also similar: roughly 17% of residential waste and 25% of commercial waste consists of food scraps; 20% and 26%, respectively, is recyclable paper and cardboard; 15% and 14%, respectively, plastics; 5% and 4%, respectively, is glass; and 6% in each sector is comprised of metals. (11) Of equal significance, the inherent hazards as well as the equipment and work processes utilized are also similar in residential and commercial MSW operations, as well as in low-road and higher-road operations.

Yet despite these similarities, the health and safety performance of the waste management industry in NYC varies considerably. The contrasts between low-road and higher-road employers within the commercial waste sector, and between low-road employers in the commercial waste sector and DSNY in the residential waste sector, could not be more stark.

3 A transfer station is a processing facility where municipal solid waste is unloaded from collection vehicles and briefly held until it is reloaded onto larger, long-haul trucks, barges, or rail cars for shipment to landfills or other treatment or disposal facilities. Transfer station operations may include compaction or baling of the transferred material.

4 A materials recovery facility (MRF) is a solid waste processing facility where materials are sorted mechanically and/or manually from waste for the purpose of recycling. A “clean” or co-mingled MRF sorts recyclable commingled materials that have already been separated from MSW by the residential or commercial source but have not been separated from each other (for example, glass bottles and metal cans). A “dirty” or mixed-waste accepts MSW and then manually and mechanically separates out designated recyclable materials.

5 Research indicates that unionized work sites in the U.S. and in other industrialized nations tend to be safer work sites. Preliminary information based on interviews of unionized and non-unionized workers in the NYC solid waste industry suggests that waste operations where workers are represented by either of the two primary unions in the industry, the International Brotherhood of Teamsters (IBT) and the Laborers’ International Union of North America (LIUNA), are more likely to have more proactive and effective health and safety programs than either operations that are non-union or operations represented by non-affiliated “rogue” unions. However, a comparative assessment of occupational safety and health at unionized vs. non-unionized commercial waste operations in New York City is beyond the scope of this report.

6 Although failure to comply with legal occupational safety and health requirements is significant, compliance in and of itself may not always be sufficient to protect worker health. Because the enactment of legal standards for occupational safety and health is a lengthy process that is subject to considerable political constraint, existing legal requirements in some instances do not reflect current scientific knowledge. The Occupational Safety and Health Administration has acknowledged that some chemical exposure limits may not be adequately protective and recommends instead reliance upon more protective, non-mandatory professional benchmarks. (113)



"If my driver wants another helper, they going to take my money. My money isn't going to be the same. My money is going to go down. If there is more than one helper they drop the pay. If I am the only helper I get \$12.50. If there is a second helper I get \$8.50"
- Helper

FATALITY REPORT – STRUCK BY MOVING EQUIPMENT

Effrain Calderon, 47, picker

Died August 17, 2005, Jamaica, Queens, NY

Effrain Calderon, a Salvadoran immigrant, had been hired only 9 days earlier when he was killed on the job on August 17, 2005 at a Regal Recycling Company solid waste transfer station and materials recovery facility in Jamaica, Queens. He was employed as a picker, working the 6 AM to 4 PM shift, separating out metals from the mixed pile in the recycling plant. The operator of a Caterpillar 960F front end loader moving the separated metals raised the bucket of the wheel loader about 38" from the ground, hit Mr. Calderon with the raised bucket, and ran him over with the left front tire. The cause of death was blunt impact to the torso, head, and extremities.

An OSHA reconstruction of the conditions at the time of the incident found that the operator of the wheel loader would not have been able to see a 5'6" person from 17 feet away with the bottom of the bucket raised 38 inches above the ground. In addition, the front windshield and side window of the front end loader were cracked and damaged, distorting the view of the operator. They had been cracked for 3 weeks without the loader being repaired or taken out of service.

Mr. Calderon's death could have been prevented. The owner of Regal Recycling admitted to OSHA that the company did not have an operating machine training program. The operator of the wheel loader had been working for Regal for 4 years and had never been trained. Other workers interviewed by OSHA also said they had not been trained by Regal. Instead, they "watch and follow what the other employees are doing." (120)

Higher-road employers and DSNY make clear efforts to provide safe, or at least safer, workplaces. Mechanical ventilation is used to reduce inhalational exposures and to prevent fugitive emissions and odors from adversely impacting the surrounding community. Collection vehicles⁷ are maintained in safe condition. Workers receive both health and safety training and task-specific training. Appropriate personal protective equipment (PPE) is provided. Regular work hours, wage rates, overtime, and meal breaks are clearly defined. Workers have access to lockers, break rooms, bathrooms, and showers. Workers may be represented by unions that have negotiated collective bargaining agreements, including protective health and safety language.⁸ There is some measure of job security, a career path for advancement into more technically challenging and higher paid jobs and ultimately for a sustainable middle class existence over time. As one unionized waste worker testified to the New York City Council:

⁷ A collection vehicle is either a rear-, side-, or front-loading truck or trailer that is equipped for the loading, compacting, transporting, and unloading of waste material or a truck or trailer with tilt-frame, hoist-type, or other similar equipment for the receiving, transporting, and unloading of portable containers that hold waste material.

⁸ For example, collective bargaining agreements for LIUNA 108 provide that "in the event any employee contends that any work situation is unsafe, the employer will make all reasonable and necessary efforts to address the problem prior to requesting that the employee resume work." The collective bargaining agreement for IBT 813 provides that "the employer and the union shall conduct periodic inspections of all facilities ... in order to ensure that all such facilities are adequately maintained and provide sanitary working conditions."

"Eighteen years ago, I resided in the Mitchell Projects in Mott Haven. I was unemployed and was collecting welfare. Then I got a job at Waste Management and became a member of Laborers Local 108. When I started with the union I was making \$5.00 an hour. Today I am making \$23.00 an hour with benefits – benefits that provide me health care and a pension. Thanks to my union job, last year I was able to buy my first home in the Throgs Neck section of the Bronx. I used my union annuity fund to put down the deposit on this new home." (67)

Significantly different working conditions prevail for employees of low-road, non-union commercial waste haulers, transfer station operators, and MRF operators. In a recent small,¹⁰ non-scientific survey of non-union drivers and helpers¹¹ from five NYC commercial waste hauling companies:

- Respondents reported working from 9 to 19.5 hours per work shift.¹²
- 71% reported having been injured on the job; 48% more than once.
- 56% reported that they are in continual pain from work activities.
- 32% indicated that they *often* either do not get or are unable to use meal breaks; an additional 50% indicated that they *sometimes* do not get or are unable to use meal breaks.
- 93% reported that their employer provided no health and safety training.
- 21% indicated that their work vehicles are *often* in unsafe condition; 62% that their work vehicles are *sometimes* unsafe.
- 91% receive no hearing protective devices from their employers; 32% no gloves; 94% no respiratory protection; 44% no high visibility clothing.
- 84% reported that if they want personal protective equipment they have to purchase it on their own.
- 63% indicated that they are never or only sometimes paid all of the wages and overtime they have earned.
- 24% work a second job to make ends meet and 9% receive public assistance. (3)

"Another company just bought my company. We used to pick up 9 or 10 tons of garbage. That was fair. Now we are picking up 23 tons. That's like double work and they keep adding stuff. I can't stop to have a slice of pizza. I have to drive while I'm eating⁹ When I tell you I do 12 hours, I do 12 hours straight. I don't take a lunch break. I don't have time for that."

– **Driver**

9 In the industry, this is known as "dashboard dining."

10 n = 34.

11 A helper is a member of the crew of a waste collection vehicle whose primary task is to retrieve disposed waste from the customer's premises and to load it onto the collection vehicle.

12 These extended work hours result at least in part from collection route inefficiencies. Commercial waste collection vehicles are estimated to travel about twice as many miles per year as DSNY trucks to collect a similar amount of waste. (146)

HIGH HAZARD, HIGH RISK WORK

WASTE COLLECTION WORK is one of the most dangerous jobs in the U.S. Sanitation workers are ten times more likely to be killed on the job than the average worker. (135,137) Driver and helper fatality rates may be as high as 80 to 120 per 100,000 workers per year. (30) The executive director of the Solid Waste Association of North America (SWANA) noted in 2015:

We're... the fifth most dangerous occupation in the United States [with] still too many worker fatalities... Not only are people dying on the routes, but we have workers getting killed in transfer stations, landfills and recycling centers. And mechanics are getting killed in maintenance shops. (33)

Preliminary national data for 2014, the most recent year for which information is available, indicate 70 work-related fatalities (17). Drivers, helpers, sorters,¹³ heavy equipment operators,¹⁴ and mechanics comprise 25% of MSW workers, yet they suffer 36% of the fatalities. (78) Occupational fatalities in private sector solid waste collection are consistently higher than those in local government sanitation agencies; 85% of fatalities in the industry occur in the private sector. (78) Small hauling companies tend to have higher fatality and injury rates than larger companies or sanitation departments. (145)

In 2014, waste management and remediation workers were 2.6 times more likely to be injured on the job than mining, quarrying, and oil and gas extraction workers and 1.4 times more likely to be injured than either construction workers or manufacturing workers. Nationally from 2003 through 2011, collection truck drivers and helpers incurred 75% of the on-the-job injuries while comprising only 46% of the workforce. (78)

Because injuries, illnesses, and fatality data are frequently underreported (178) especially by small employers, it is likely that the above data do not reflect the full extent of occupational harm among MSW workers. (9)

The reliance on intensive manual labor in the waste collection process and the composition and characteristics of the wastes collected contribute to the health and safety risks encountered by workers in the industry. Waste collection vehicle drivers, helpers, front end loader and fork lift operators, sorters, mechanics, and other MSW collection, transfer station, and MRF personnel are exposed or potentially exposed to a broad array of chemical, biological, physical, safety, and ergonomic hazards, and to various stressors.¹⁵ Hazards and stressors may vary according to job title or work task. However, simultaneous exposure to multiple hazards is common.

Exposures to harmful chemicals can result from chemical products deliberately introduced into the work environment for use in maintenance and repair operations (for example, solvents, degreasers, hydrated lime); chemical substances inappropriately or illegally deposited

13 A sorter manually removes items from a mixed-materials waste stream for the purpose of upgrading or concentrating streams of similar recyclable materials. The operation may occur in conjunction with a conveyor belt or on a sorting area.

14 Heavy equipment means a mobile, power-driven vehicle such as a wheel loader, excavator, bulldozer, or backhoe that is used to carry, push, pull, lift, etc.

15 A stressor is an external event, situation, or condition that provokes stress in an organism. Stress in humans refers to the harmful physical and emotional responses that occur when interactions between persons and their environment are perceived as straining or exceeding their capabilities, resources, or needs and as threatening their well-being.

FATALITY REPORT – CRUSHED IN COMPACTOR

Luis Camarillo, 18, helper

Died March 16, 2013, Brooklyn NY

Luis Camarillo was only 18 years old and only 3 weeks into his new job when he was crushed to death by the compactor mechanism of a Chambers Paper Fibers Corporation waste collection truck. According to OSHA case files, Mr. Camarillo was working at the rear of the truck unloading waste paper. The hatch was partially open when he put his head and arm into the hatch to manually remove some final pieces of paper. The driver did not see Mr. Camarillo and began to pull out of the bay, closing the hatch at the same time. Mr. Camarillo was hit in the chest and then crushed by the truck's hydraulics system, killing him. (144)

Mr. Camarillo's death could have been avoided had the employer implemented basic safety precautions. The OSHA investigation determined that the employer did not have an operating policy or employee training program in place to ensure safe working practices and conditions. Helpers were not provided with or supervised to confirm the wearing of reflective vests. Drivers were not taught to maintain eye contact with helpers or to use a spotter or signal person. Drivers also had not been instructed that, before opening or closing the tailgate, confirmation was required that no workers were in the operational area.

The OSHA investigation also determined that a previous investigation of a previous fatality at Chambers Paper Fibers five years earlier also found that the employer did not have operating procedures for employees to follow during the cleaning of the garbage hatch. (128)



in the waste stream (for example, chemical medical waste); and chemical byproducts generated by work operations (for example, carbon monoxide and diesel emissions). Workers entering dry wells¹⁶ in transfer stations are at risk of asphyxiation from hydrogen sulfide and other gases.

¹⁶ A dry well is an underground chamber, often containing stones or rubble, that collects drainage water and allows it to seep gradually into the soil.

CHEMICAL EXPOSURE REPORT – HYDRATED LIME

June 2012, Long Island City, NY

On June 20, 2012, OSHA received an anonymous employee complaint of “burning eyes due to chemicals being used” at the A & L Cesspool putrescible transfer station in Long Island City, New York. At this facility, among other operations, grease from cooking oils collected from restaurants throughout New York City is processed for recycling.

In response to the complaint, OSHA inspected the transfer station on June 26, 2012. OSHA found that bell mine hydrated lime, a mixture of calcium hydroxide and chrySTALLINE silica, is routinely used to treat contaminated water and to clean floors in the recycling area. In the separation room, spilled hydrated lime “was not cleaned up from the floor where employees walk and work.”

The product Safety Data Sheet (SDS) specifies a cautionary approach to spills:

Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA [high efficiency particulate air] filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

The SDS also indicates that engineering controls, including mechanical ventilation such as general ventilation and/or local exhaust ventilation, “may be required to control the primary or secondary risks associated with this product.” These risks include serious eye damage, respiratory irritation, skin irritation, and cancer (from inhalational exposure to chrySTALLINE silica).

Precautions for safe handling include appropriate personal protective equipment (PPE) such as respirators where ventilation is inadequate, and hand (chemical-resistant, impervious gloves), skin, eye, face, and body protection. “Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.” (40)

The employer provided half-face negative pressure respirators to workers who perform recycling and cleaning operations. However, the respirators were equipped with the wrong filter cartridges. In addition, the employer did not have a written respiratory protection program, did not train employees in proper use of respirators, and did not medically evaluate or fit-test workers to ensure they could wear respirators. In other words, workers appeared to be protected but were not protected.

In addition, OSHA found that employees did not receive hazard communication (chemical safety) training, that emergency exits were blocked and locked, that emergency exit signs were not maintained, that workers were not provided with eye and face protection when using power washers operating at 4,000 p.s.i., that required emergency eyewashes and safety showers were not available, and that oxygen cylinders were stored with acetylene cylinders, creating an explosion hazard. (127)

Exposures to harmful biological agents may occur via contact with infected blood or bodily fluids or contact with syringes or other medical or drug waste inappropriately or illegally deposited in the waste stream. Physical disturbance of or working in proximity to decomposing putrescible waste may expose workers to airborne microorganisms such as fungi (mold) and gram-negative bacteria, which may cause allergic and irritant responses, respiratory problems, and hypersensitivity reactions.

MSW workers are exposed to harmful physical agents such as noise and vibration from collection vehicles, heavy equipment, and sorting, compacting, and baling machinery. Workers may also be occupationally exposed to radioactive medical waste and to temperature extremes.

Drivers, helpers, and other workers are at risk of serious injury and death from being struck by or crushed by vehicles, front end loaders, compactors, baling machines, or collection carts and dumpsters.

Additional worker safety issues include hazardous walking/working surfaces, being caught in moving machinery such as conveyor belts, compactors, and balers that may lack machine guards, and falls from heights. Waste collection operations and maintenance and repair operations can expose workers to hazardous energy sources from trucks, containers, heavy equipment, conveyor belts, and balers. Energy in any form (mechanical, electrical, pneumatic, chemical, hydraulic, or thermal) is of concern when it can build to a level (potential energy) or when it is released in a quantity (kinetic energy) that could harm a worker.¹⁷ In collection trucks, one source of hazardous energy can be controlled by equipping the vehicle transmission with a neutral position interlock to prevent it from engaging in drive during compacting operations.

Drivers, helpers, and sorters are at high risk of musculoskeletal injuries. Risk factors include: exerting excessive force while lifting, pulling, pushing, twisting, or gripping a tool or object; performing the same motions repeatedly; working in an awkward position or fixed posture over time; exposure to vibration from equipment or from vehicle operation; direct contact pressure of hard edges (i.e., the edge of the conveyor belt) on soft tissues; working for long periods without adequate rest breaks (recovery time); working in cold environments; and stressors such as rapid work pace and lack of control over work conditions. Collection vehicles lack adjustable and supportive driver seats, and the seats are not equipped with vibration attenuation.

Workplace stressors include wage theft, lack of bathroom access, long hours, no meal breaks, traffic, and productivity pressures and route scheduling, low and uncertain pay, lack of promotional opportunities, and job insecurity.

The resulting injuries, illnesses, and fatalities are not inevitable; for the most part, neither are the hazards and exposures that cause them. There are known and effective methods for preventing, eliminating, or reducing these hazards and exposures. For example, decades ago Denmark was able to achieve zero fatalities among MSW collection drivers and helpers at a time when the American fatality rate was 46 per 100,000 workers. (137) Collection methods and technologies were similar in both nations, as was the composition of the waste stream. Prevention of fatalities in Denmark was attributable to occupational safety and health interventions, indicating that continuing elevated injury, illness, and fatality rates among MSW workers in the U.S are likely attributable to insufficient occupational safety and health intervention.

¹⁷ Effective prevention of worker exposure to hazardous energy requires identifying the energy source, de-energizing the equipment by isolating it from its energy source, dissipating any stored energy that could affect the equipment, and locking out the energy-isolating device (lockout/tagout).

HAZARD PREVENTION AND CONTROL HIERARCHY

WORK-RELATED INJURIES, illnesses, and fatalities result from worker exposure to hazards. Exposures can be prevented and hazards can be identified or anticipated. Chance events or unpredictable situations may be factors but are rarely the source of the harm. Controlling exposures to occupational hazards is the fundamental method of protecting workers. Primary emphasis should be placed on hazard prevention, as feasible, rather than on protective gear or modifying worker behavior.

The hierarchy of controls of hazards, emphasized by OSHA¹⁸ and NIOSH¹⁹ and referenced in OSHA standards, aids in determining how to implement feasible and effective hazard control measures. The first and most effective approach is to prevent, eliminate, or reduce the hazard at its source.²⁰ If this first approach is not technically feasible or is inadequately protective when implemented, the next most effective strategy is to use engineering controls such as local exhaust

ventilation²¹ or placing a barrier between the hazard and the employee. The goal is, in so far as is technically feasible, to design or redesign the work environment and the job itself to eliminate hazards or reduce exposure to hazards in order to minimize reliance on human behavior, which is subject to human error. The third strategy, following in order of decreasing effectiveness, is administrative controls such as adherence to established safe work practices or job rotation out of hazardous work areas to reduce the amount of time a worker is exposed. Finally, and least effectively, personal protective equipment (PPE) should be employed as a last resort if the other strategies are not technically feasible or have been implemented and still provide inadequate protection.

Following the hierarchy normally leads to the implementation of inherently safer systems where the risk of illness or injury has been eliminated or substantially reduced.

Both OSHA and NIOSH emphasize the desirability of utilizing

the hazard controls at the top of the hierarchy, where technically feasible, because they eliminate or reduce the hazard. Measures at the lower end of the hierarchy leave the hazard in place, and the potential for human error, which could compromise protection, is high.

Unsafe behaviors at work have less consequence if the hazard has been controlled. All human beings, even those who are highly-motivated and well-trained, make mistakes. One goal of occupational safety and health is to reduce the areas in which mistakes can be made and to diminish the human harm that may result from a mistake, i.e., to redesign work equipment, materials, and processes to decrease the opportunity for human error and to minimize health or safety consequences should error occur.

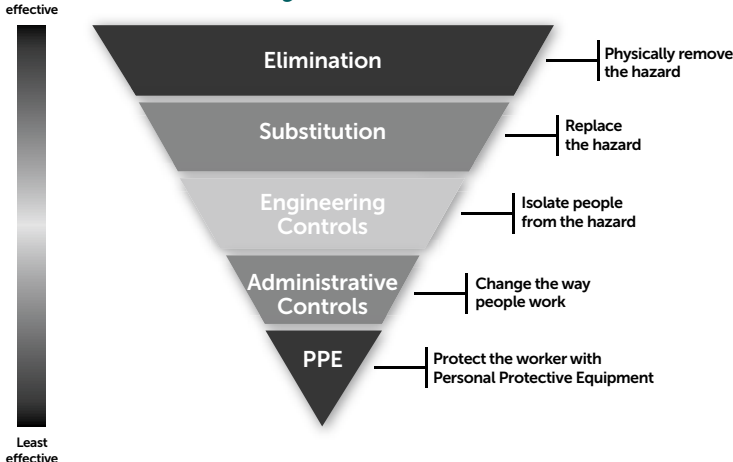
¹⁸ Occupational Safety and Health Administration, part of the U.S. Department of Labor.

¹⁹ National Institute for Occupational Safety and Health, part of the Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

²⁰ Reduce the hazard at its source means substituting a less hazardous substance, process, or type of equipment.

²¹ Local exhaust ventilation (LEV) is a specialized system of mechanical ventilation designed to capture, and contain or exhaust, a contaminant at the source, immediately upon generation, so as to prevent it from entering the worker's breathing zone or the general work environment.

Hierarchy of Controls



WASTE MANAGEMENT HIERARCHY

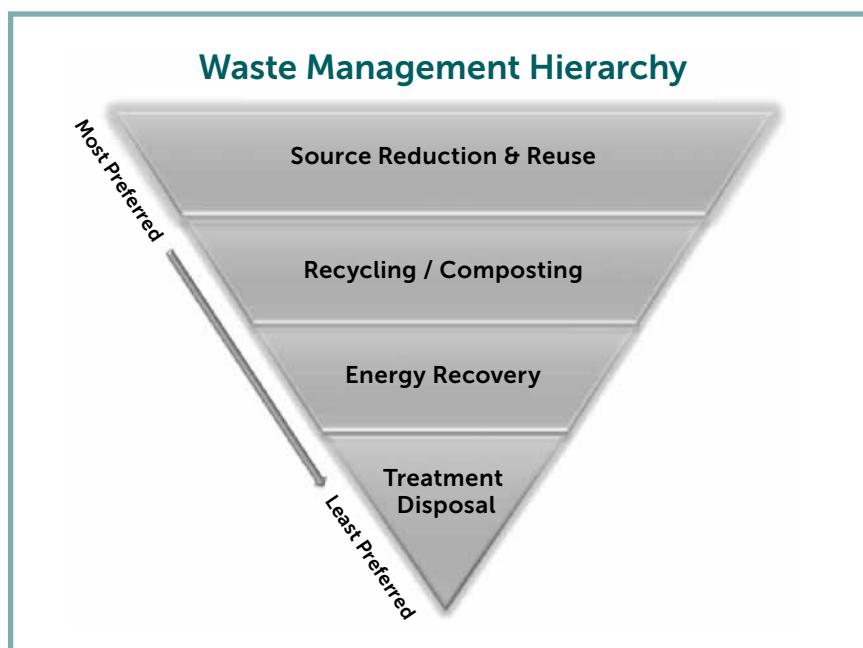
JUST AS THE HIERARCHY of controls of hazards provides a roadmap for effective methods of addressing workplace hazards, a similar solid waste management hierarchy, emphasized by EPA, offers guidance for effective protection of the environment throughout the solid waste management process. The purpose of the waste management hierarchy is to make waste management practices as environmentally benign as possible. (162) The two hierarchies are complementary.

The first and most effective step is source reduction, also known as waste prevention, which entails designing products that will ultimately generate less waste and be less toxic. This is the most protective environmental strategy and is analogous to hazard elimination and hazard reduction in the hierarchy of controls of hazards.

The next most effective step is recycling, which is the recovery of useful materials, such as paper, glass, plastic, and metals, from the waste stream, then sorting and processing the recyclable materials into raw materials, and finally remanufacturing the recycled raw materials into new products. Recycling also can include composting of food scraps and other organic materials.

Treatment and disposal are at the bottom of the waste management hierarchy and are the least preferred options in terms of effective environmental protection. Prior to disposal, treatment can help reduce the volume and toxicity of waste. Treatment can be physical (e.g., shredding), chemical (e.g., incineration), or biological (e.g., anaerobic digestion). Landfills are the most common form of waste disposal. (176) Together treatment and disposal constitute the waste management equivalent of PPE, i.e., the last resort when other, better options are not workable, and the least effective because the hazard or the waste remains in place.

The two hierarchies are mutually beneficial. Elimination or reduction of chemical or biological contaminants in the waste stream protects MSW workers as well as the general environment. The use of local exhaust ventilation to protect workers in sorting operations can also significantly reduce the potential for release of fugitive emissions into the surrounding community. Noise reduction on heavy equipment and conveyor belts will benefit not only workers but also the adjacent neighborhood.



SPECIFIC HAZARDS AND CONTROLS

THIS SECTION EXPLORES in greater depth a number of the biological, chemical, safety, physical, ergonomic, and stressor hazards faced by workers in the MSW industry. Recommendations²² are provided for how employers can address hazards. This section covers only some of the many hazards in the industry: identifying or addressing all hazards is beyond the scope of this report.

Biological hazard – *Bloodborne pathogens*

Bloodborne pathogens are infectious microorganisms in human blood that can cause disease in humans. These pathogens²³ include hepatitis B and C, human immunodeficiency virus (HIV), and Ebola virus. Hypodermic needles and other potentially contaminated sharps such as scalpels, razors, and broken glass, as well as medical waste and blood-, urine-, and feces-contaminated materials, frequently enter the MSW waste stream, putting MSW workers at risk for exposure to bloodborne pathogens.

Eighty six percent of DSNY collection workers reported having exposure to human feces in the waste stream in the prior 12 months. (60) Exposure to needles and other medical waste such as blood and bandages was reported by 90% of MSW workers²⁴ in the state of Washington. Needles originated from uncontained disposal or ruptured sharps containers in the waste stream but also from residential use and recreational drug use. Seventy four percent of Washington MSW workers received no bloodborne pathogen training; 74% incurred cuts or scratches on the job; 32% had direct contact with blood on their clothing or shoes, 13% on their skin, and 5% on their face or eyes. Twenty one percent reported having been stuck or scratched by a waste hypodermic needle. (161)

Bloodborne pathogens – Requirements and best practices for employers

The OSHA Bloodborne Pathogens Standard²⁵ requires that any employer with one or more employees with occupational exposure must have a written Exposure Control Plan designed to eliminate or minimize employee exposure. OSHA defines occupational exposure as “reasonably anticipated skin, eye, mucous membrane, or parenteral²⁶ contact with blood or other potentially infectious materials²⁷ that may result from the performance of an employee’s duties.”

Assessing whether employees are exposed should be done on a “facility-by-facility, job-task-by-job-task basis, not generically across the industry.” (118) “If a sharp (e.g., syringe, lancet) is found in the waste stream, one must assume that it has been used to inject a medication or drug into a person and, by virtue of that action, is reasonably anticipated to have blood on it; therefore, it is a contaminated sharp. The waste hauler’s exposure determination would need to reflect this assessment in the employer’s written exposure control plan.” (119)

Because virtually all drivers, helpers, sorters, and many other MSW workers who work directly with the NYC waste stream can be reasonably anticipated to have contact with known or presumed bloodborne pathogens (BBP) in the course of their work, a written BBP exposure control plan is likely to be a legal requirement for commercial waste companies.

22 In this report, use of the word “must” refers to compliance with legal requirements; use of the word “should” refers to adherence to established principles of industrial hygiene and/or to recommendations and guidance from government agencies, professional and technical organizations, and industry associations.

23 Pathogens are any microorganisms capable of producing disease.

24 n = 940.

25 29 CFR 1910.1030.

26 Parenteral means entering the body by any means other than ingestion (swallowing).

27 Other potentially infectious materials (OPIM) means: human body fluids such as semen, vaginal secretions, cerebrospinal fluid, etc.; any body fluid that is visibly contaminated with blood; all body fluids in situations where it is difficult or impossible to differentiate between body fluids; and any human tissue or organ other than intact skin.

Each affected employer must identify all job classifications in which all or some employees have occupational exposure and must also identify all tasks and procedures in which occupational exposure occurs, without regard to the use of personal protective equipment.

Each affected employer must provide hand washing facilities which are readily accessible to employees. If providing hand washing facilities is not feasible (i.e., on a collection vehicle), the employer must provide an appropriate antiseptic hand cleanser and either clean cloth or paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands must be washed with soap and running water as soon as feasible.

Each affected employer must make available, at no cost to the employee, the hepatitis B vaccination series to all employees with occupational exposure and must provide post-exposure evaluation and follow-up to all employees who have an exposure incident.²⁸

Each affected employer must provide BBP training to each employee with occupational exposure, at no cost to the employee and during working hours. Training must occur at the time of initial assignment to tasks where occupational exposure may take place and then at least annually. Training materials appropriate in content and vocabulary to the educational level, literacy, and language of employees must be used.

The BBP training program must cover:

- The requirements of the BBP standard and an explanation the requirements;
- The epidemiology, symptoms, and modes of transmission of bloodborne diseases;
- An explanation of the employer's exposure control plan;
- An explanation of how to identify work tasks that may involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of methods to prevent or reduce exposure, including engineering controls, work practices, and PPE;
- Information on the types, selection, proper use, decontamination and disposal of PPE;
- Information on the hepatitis B vaccine, including information on its effectiveness, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
- Information on what actions to take and who to contact in an emergency involving blood or other potentially infectious materials;
- An explanation of the procedure to follow if an exposure incident occurs, including the reporting the incident, medical follow-up, and post-exposure evaluation and follow-up.

Biological Hazard – *Organic dust*

Organic dusts consist of microscopic dried particles of plants, animals, fungi, or bacteria that may become suspended in air and thus are available for inhalation. Inhalation of organic dusts and bioaerosols²⁹ has been associated with a variety of adverse health effects, including organic dust toxic syndrome and other respiratory conditions, allergic and irritant responses, and hypersensitivity reactions. Elevated concentrations of organic dusts have been identified and measured in solid waste collection, disposal, and recycling operations in Europe and

²⁸ Exposure incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

²⁹ A bioaerosol is an airborne mixture of viable and non-viable (living and dead) microorganisms from all varieties of living things. The mixture may include intact microorganisms as well as organism fragments and byproducts.

elsewhere, and associated health harm to solid waste workers has been well documented, as reported below. The British government, referring to MSW, notes “the hazard which probably presents the greatest health risk relates to biological materials, and particularly bioaerosol.” (26)

The issue of potential worker exposure to bioaerosols in MSW operations and facilities has not received comparable scientific or industry attention in the U.S.

High concentrations of bioaerosols, primarily fungi (mold), have been measured adjacent to the hoppers of waste collection trucks. The hands and clothing of workers involved in the manual collection of MSW were found to be contaminated with streptococci, enterobacter, and other microorganisms. (141) MSW workers have an increased risk of skin itching, and vomiting or diarrhea. (152) Lower gastrointestinal symptoms are common among waste handlers and are associated with exposure to fungi and endotoxin.³⁰ (52,155) Workers sorting large quantities of source-segregated waste in a recycling center were exposed to significantly elevated concentrations of endotoxin.³¹ (89)

Working in MRFs is associated with a range of respiratory diseases and symptoms in exposed workers, including dry cough, shortness of breath, asthma, organic dust toxic syndrome (ODTS), diarrhea, and gastrointestinal problems. The longer a worker is employed at a MRF, the more likely s/he is to experience these issues. (38) Workers at a waste sorting plant developed asthma, flu-like symptoms, eye and skin irritation, fatigue, and occasional nausea. Half became ill within seven months of starting work. (26) MSW workers exposed to organic dust were found to be 1.5 times more likely than other workers to develop an occupational disease, 2.6 times more likely to develop an allergic respiratory disease, 1.4 times more likely to develop other respiratory diseases, 6.0 times more likely to develop an infectious disease, and 2.8 times more likely to develop gastrointestinal issues. (141)

MSW workers exposed to elevated levels of endotoxin had increased risk for cough with phlegm, hoarse parched throat, chest tightness, gastrointestinal issues, mucosal and skin symptoms, work-related organic dust toxic syndrome, and chronic bronchitis, compared to workers with lower exposure. Recycling worker lung function decreased over the work shift, caused by exposure to organic dust; MSW collectors have poorer lung function than non-collectors. (39,50,150) MSW workers occupationally exposed to low levels of bacteria experienced increases in eye and nose irritation. Bronchitis increased significantly with increasing concentrations of microbial exposure. (42,44)

Drivers, handlers, sorters, heavy equipment operators, and facilities managers interviewed by NYCOSH indicated that none had been trained about organic dust hazards, recognition, prevention, or protection. In some operations, there is no access to soap and running water or to bathrooms. Neither locker rooms and change areas nor lunch rooms nor break areas are provided. Work clothes are not provided. Workers exit at the end of the work day wearing their dirty and potentially contaminated personal clothing. It is well documented that contamination of the home and illness in family members may derive from contaminated work clothing being worn or brought home from a variety of work settings. (25,56,138) Where mechanical ventilation is present, it is designed to exhaust potentially contaminated indoor air upwards toward ceiling mounted discharge units. This may have the unfortunate consequence of drawing bioaerols or other contaminants, if present, directly into the workers’ breathing zones. Local exhaust ventilation is not present.

³⁰ Endotoxins are cell walls of gram-negative bacteria. Gram-negative bacteria can cause many types of infections, including respiratory infections such as certain types of pneumonia.

³¹ Notably, measured concentrations of total dust were relatively low, indicating that total dust measurements may not be a surrogate for endotoxin, i.e., dust concentrations alone may not provide adequate information about the presence, absence, or concentration of endotoxin.

Organic dust – Requirements and best practices for employers

Protective work clothing should be provided to cover or to replace personal garments. Either laundry services should be provided or workers should be instructed to bag their dirty work clothes and wash them separately from other garments. Workers should be instructed not to leave the workplace wearing any outer clothing or equipment worn during the work shift.

Bathroom facilities, including soap, hot running water, single-use towels or air-drying machine, and showers should be provided. Workers should be encouraged to shower at the end of the work day.

Clean change rooms and lockers should be provided, preferably including separate storage facilities for protective work clothing and equipment and for street clothes.

Clean lunchrooms and/or break rooms should be provided. These areas should be in buildings or locations remote from potentially contaminated work areas. Alternatively they should be under positive pressure relative to potentially contaminated work areas in the same building. Employees should be instructed not to wear or bring potentially-contaminated protective work clothing or equipment into the lunchroom.

The technical feasibility of local exhaust ventilation should be determined.

Employers should train employees about the hazards of exposure to organic dusts. Training should cover health hazards, symptoms, protective measures, safe work practices, and the importance of rigorous personal hygiene. Training materials and methods appropriate in content and vocabulary to the educational level, literacy, and language of employees should be used.

Chemical hazard – Diesel exhaust

Diesel exhaust is emitted from a broad range of diesel engine vehicles. In the MSW industry, these include on-the-road vehicles such as rear-load collection trucks, grease tankers, and box trucks that collect shredded paper, as well as off-the-road equipment such as front end loaders and forklifts. Working outdoors in close proximity to vehicles may expose workers to diesel exhaust. Diesel exhaust may also be drawn into vehicle cabs through windows, doors or inefficient cab filters. MSW workers exposed on a frequent basis to diesel exhaust include drivers, helpers, front end loader operators, spotters,³² scale house³³ operators, and some pickers. In a 2015 survey of drivers and helpers, 78% reported being often or sometimes exposed to diesel emissions. (3)

NYC Local Law 38 of 2005 required all city-owned and operated diesel-powered vehicles to use ultra low sulfur diesel fuel (ULSD) and to be equipped with the best available exhaust after-treatment technology. The 2006 federal Clean Air Act mandated the use of ULSD fuel by on-road diesel equipment and required new heavy duty diesel trucks to come equipped with diesel particulate filters or other equipment to meet a particulate standard of 0.01grams per brake-horsepower-hour starting with the 2007 model year. (104)

NYC's commercial waste truck fleet consists of approximately 4,300 active vehicles equipped with heavy-duty diesel engines.³⁴ Trucks range in size from 16,000 pounds gross vehicle weight to greater than 60,000 pounds gross vehicle weight. The average age of the trucks is 16 years; 25% are 20 years old or older and some are over 30 years old. In 2013, only

³² Spotters direct the safe operation of mobile on- and off-road equipment, including waste collection trucks and front end loaders, to prevent injury to pedestrian employees or bystanders in transfer stations and MRFs. Spotters may be used when entering, unloading, and exiting facilities and during collection and compacting operations at some pickup points along the waste collection route.

³³ Scale house is the vehicle point of entry to a transfer station or MRF, where incoming collection trucks are weighed to determine how much refuse is being delivered and where refuse is monitored for the possible presence of radioactive waste.

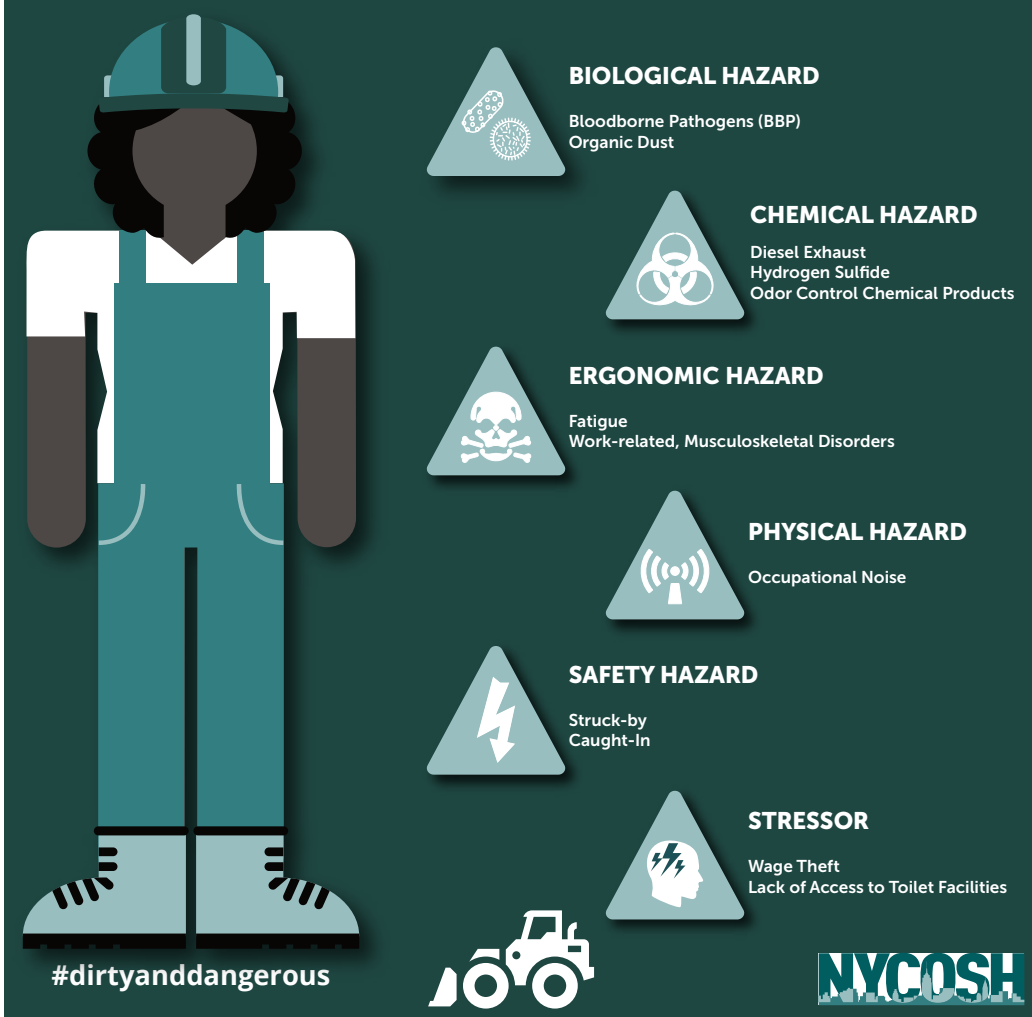
³⁴ Some industry insiders estimate that 2,000 or fewer of these collection vehicles are in active service.

10% of the fleet was new enough to meet the 2007 emissions criteria. (64) In contrast, by 2013 DSNY's entire fleet of approximately 2,500 collection vehicles had been replaced or retrofitted to meet EPA and Local Law 38 requirements, achieving a reported fleet-wide 85% reduction in particulate matter emissions and a greater than 50% reduction in NO_x ³⁵ emissions. (103)

Diesel exhaust is a complex mixture of the byproducts of the incomplete combustion of diesel fuel; it includes toxic gases such as carbon monoxide, sulfur oxides, nitrogen oxides, benzene, acrolein, formaldehyde and polycyclic aromatic hydrocarbons, as well as respirable

SPECIFIC HAZARDS FACED BY NYC'S COMMERCIAL WASTE WORKERS

There are 6 types of workplace hazards. The following were found by NYCOSH to have the most harm potential to NYC commercial waste workers.



³⁵ NO_x is an abbreviation for nitrogen oxides, a gaseous component of diesel emissions.

particulates³⁶ composed of elemental carbon to which additional chemicals have adsorbed (attached). The ultimate composition of the mixture depends on the type of the engine, engine speed and load, emission controls, fuel composition, and other factors.

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause cough, wheezing, tightness in the chest, headache, lightheadedness, nausea, and numbness and tingling in the extremities. It may cause people with allergies to become more sensitive to allergens. It can damage lung tissue, lower the body's resistance to respiratory infection, and worsen chronic lung diseases, such as emphysema and asthma. Prolonged exposure can increase the risk of cardiovascular, cardiopulmonary, and respiratory disease and lung cancer. The International Agency for Research on Cancer (IARC), part of the World Health Organization (WHO), has classified diesel engine exhaust as a human carcinogen (cancer-causing agent), based on sufficient evidence that exposure is associated with an increased risk for lung cancer. As with most cancers, it may take many years after initial exposure for diesel-related cancers to develop.

Diesel exhaust – Requirements and best practices for employers

The most effective method for preventing exposure to diesel emissions is to eliminate the use of diesel fuel. This can be accomplished by substituting a cleaner energy source, where feasible. Diesel-powered forklifts in many cases can be replaced by forklifts powered by propane or by rechargeable batteries. Diesel-powered trucks can be retrofitted to use ultra low sulfur diesel fuel. Per Local Law 145 of 2013 all heavy duty trade vehicles (greater than 16,000 pounds), whether pre- or post-2007 models, must meet the 2007 federal emissions standard for new vehicles by the year 2020. (93) After-treatment devices such as diesel exhaust filters and oxidation catalytic converters can be installed now.³⁷

If an alternative energy source or after-treatment device cannot be used, mechanical ventilation is the next most effective method for reducing worker exposure. Diesel exhaust in enclosed areas (such as idling, fueling, maintenance, and cleaning areas) should be controlled using both local exhaust ventilation and general ventilation. Local exhaust ventilation is the most effective ventilation system, where feasible. It removes diesel at or near the tailpipe, before it has an opportunity to enter the worker's breathing zone or the general work environment.

Some workers can be isolated from diesel exhaust. Diesel-powered vehicles should have sealed air-conditioned cabs and should be operated with windows closed. If appropriate and feasible, install exhaust extenders that re-direct the exhaust away from the driver or handlers.

Safe work practices can also reduce exposure to diesel exhaust. All diesel equipment should have regular maintenance and frequent tune-ups. The exhaust system should be checked for leaks. Vehicles should be fitted with emission control devices (air cleaners), such as collectors, scrubbers, and ceramic particle traps. Air cleaners should be checked regularly and replaced when they are dirty. Cracks in the vehicle should be fitted with weather stripping to prevent exhaust from seeping in. Idling should be minimized.

³⁶ Respirable particulates are airborne particles that are small enough that, when inhaled, are able to bypass the defense mechanisms of the upper respiratory system and deposit deep in the lungs, where they are more likely to cause health harm.

³⁷ DSNY fuels a portion of its fleet with compressed natural gas (CNG). However, commercial waste carters have little access to CNG and thus have minimal incentive to invest in cleaner alternative fuel vehicles. Because natural gas is a low-carbon, clean-burning fuel, a switch to natural gas could substantially reduce the emission of hydrocarbons, carbon monoxide, nitrous oxides, and greenhouse gases by waste collection vehicles. New York City could encourage investment in cleaner alternative fuel vehicles in the commercial waste industry by providing access to DSNY CNG fueling stations on a fee for service basis.



Rene Francisco Rivas

TRIPLE FATALITY REPORT - ASPHYXIATION

Shlomo Dahan, 49, plumbing contractor

Died June 29, 2009, Jamaica, Queens, NY

Harel Dahan, 23, plumbing contractor

Died June 29, 2009, Jamaica, Queens, NY

Rene Francisco Rivas, 52, recycling worker

Died June 29, 2009, Jamaica, Queens, NY

Shlomo Dahan, Harel Dahan, and Rene Francisco Rivas were killed in a single incident at the Regal Recycling Company plant in Jamaica, Queens, the site of another Regal worker fatality four years earlier. The Dahans were father and son plumbing contractors. Mr. Rivas was a six year employee at Regal.

Regal hired the S. Dahan Piping and Heating Corporation to clean out an 18 foot deep, 3 foot wide dry well, with about 4 feet of liquid at the bottom. They were using a vacuum truck to suck out water and debris. Because of the L shape configuration of the dry well, they experienced difficulty removing all of the waste. The Dahan crew borrowed a ladder from Regal Recycling and Harel Dahan instructed a Dahan employee, a Mr. Alvarez, to enter the hole to assess the situation. The worker went about half way down into the well when he became dizzy and exited the space. Harel Dahan decided to enter the space himself. He was overcome by hydrogen sulfide and fell unconscious to the bottom of the well. His father, Shlomo Dahan, then went down to rescue him and was also overcome. Rene Rivas, a Regal recycling worker, then attempted to rescue the Dahans and was also overcome. The official cause of death was determined to be asphyxiation due to overexposure to hydrogen sulfide vapor.

Firefighters who responded measured a hydrogen sulfide concentration of 200 parts per million (ppm) in the well,(148) a level that significantly exceeds federal requirements and recommendations. The National Institute for Occupational Safety and Health (NIOSH) IDLH (immediately dangerous to life and health) level for hydrogen sulfide is 100 ppm. Its recommended maximum (ceiling) exposure over a 10 minute period is 10 ppm. The legally enforceable OSHA permissible exposure limit (PEL) is 20 ppm averaged over an 8 hour period.

These deaths were entirely preventable. The dry well should have been designated by the employer as an OSHA permit-required confined space, triggering strict restrictions on entry and rigorous requirements for entry qualifications, procedures, and equipment. According to the OSHA inspection report, the Regal owner and his managers had full knowledge that dry well entry was an extremely hazardous procedure requiring specialized equipment and training. A Regal supervisor present at the time of the incident "admitted that he knew the space inside the dry well is dangerous. He stated the smell in the dry well was very bad and that means a lot of gas. He was aware that no one should go down inside the dry well; however, he never stopped anyone from entering the space. When asked why he allowed employees to enter the space he would not respond." The OSHA investigator also interviewed a different plumbing contractor who had bid on the job to clean the dry well. The contractor stated that Regal Recycling had asked that the contractor's employees enter the dry well to clean it. The contractor would not permit this, and as a result did not get the job. (125)

Chemical Hazard – Hydrogen sulfide

Hydrogen sulfide (H₂S, also known as sewer gas) is a colorless gas known for its pungent “rotten egg” odor³⁸ at low concentrations. It is extremely flammable and highly toxic. Hydrogen sulfide is a byproduct of the decomposition of organic material, such as putrescible commercial waste or sewage sludge. It occurs naturally in sewers, septic tanks, manure pits, well water, and dry wells. Because it is heavier than air and can travel along the ground, hydrogen sulfide tends to pool in low-lying, poorly ventilated spaces. Its presence or potential presence can make work in these spaces extremely dangerous. (114)

The health effects of exposure to hydrogen sulfide depend on the concentration of the gas and the frequency and duration of the exposure(s). However, adverse effects are seen even at low concentrations. Effects range from headache to dizziness to altered breathing and eye injury to unconsciousness and death. At high enough concentrations, which are not uncommon, it can quickly overcome unprepared workers, including rescue workers. Hydrogen sulfide caused 60 worker deaths between 2001 and 2010. (114) Three workers were killed by H₂S at a Queens, N.Y. recycling facility in 2009 while attempting to purge water and sludge from a dry well (see sidebar). Spaces such dry wells are likely to be confined spaces or permit-required confined spaces, per the OSHA Permit-Required Confined Space Standard (29 CFR 1910.146).

A confined space is defined as a space that has limited openings for entry or exit, is large enough for entering and working, and is not designed for continuous worker occupancy. Confined spaces include underground vaults, tanks, storage bins, manholes, pits, silos, underground utility vaults, and pipelines.

A permit-required confined space is a confined space that may have additional dangers such as a hazardous atmosphere,³⁹ material which could engulf an entrant, a shape that could trap an entrant, or other serious physical hazards such as unguarded machines or exposed live wires.

Hydrogen sulfide – Requirements and best practices for employers

Per the OSHA Permit-Required Confined Space Standard, 29 CFR 1910.146, the employer must proactively evaluate the workplace to identify any permit-required confined spaces. If there are permit spaces, the employer must inform potentially-exposed employees by posting danger signs or by other effective means, of the existence, location, and danger of the permit spaces. If the employer decides that employees or contractors are not to enter permit spaces, the employer must take effective measures that prevent them from entering.

If the employer decides that employees or contractors will enter permit spaces, the employer must develop and implement a written permit confined space program that complies with the extensive and rigorous protective requirements of 29 CFR 1910.146. These include, but are not limited to: monitoring the air in the space from the outside before entering; ventilating the space continuously to remove (in this case) accumulated hydrogen sulfide; monitoring the air in the space continuously during entry; and ensuring that rescue procedures, personnel, and equipment are in place.

However, the safest way to clean out a confined space is to do it remotely, without entering, for example, with a vacuum truck, if feasible.

³⁸ The pungent “rotten egg” odor of hydrogen sulfide that is noticeable even at low concentrations does not provide a reliable warning of danger. Odor desensitization (olfactory fatigue, loss of sense of smell) occurs very rapidly and within a couple of minutes the gas cannot be smelled at all even though it is present. At high concentrations complete desensitization (olfactory paralysis) can occur instantly.

³⁹ Hazardous atmosphere means air that may expose employees to risk of death, incapacitation, impairment of ability to escape unaided, injury, or acute illness from one or more of the following: flammable gas, vapor, or mist; airborne combustible dust; oxygen deficiency or enrichment (not enough or too much oxygen); the presence of any airborne substance at or above its permissible exposure limit (PEL).

If employees are potentially exposed to hydrogen sulfide, for example from a dry well, the employer should train employees about hydrogen sulfide.⁴⁰ Training should include, at a minimum, identification of operations and locations where employees may be exposed to hydrogen sulfide either under normal conditions or in a foreseeable emergency; methods to detect the presence of H₂S in the work area; the symptoms and hazards of exposure to H₂S; and what steps employees can take to protect themselves from H₂S, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as engineering controls, safe work practices, emergency procedures, and personal protective equipment to be used.

Chemical hazard – *Odor control chemical products*

NYC requires putrescible solid waste transfer stations to utilize odor control chemical products and equipment:

§ Section 4-16: Design Requirements and Equipment (b) Ventilation, Dust and Odor Control. (3) Odor control equipment shall automatically neutralize odors in exhaust air as it is ventilated from the enclosed building. The odor control equipment shall include a permanent hard-piped high-pressure system, suspended above the facility's tipping floor with rings of mist nozzles strategically aimed at fans and exhaust vents. The odor-neutralizing agent shall be applied as a mist in the vicinity of exhaust points from the building. A scented masking agent is not an odor-neutralizing agent. (147)

A DSNY report calls for odor-neutralizing agents to be introduced "into exhaust air" as distinguished from in the "vicinity" of exhaust vents. (96) This distinction may be important, as 57% of non-union respondents in a small survey reported they often or sometimes suffer skin or respiratory irritation from exposure to misting agents in transfer stations. (3) Transfer station and MRF management personnel in several locations stated that odor-neutralizing agent mist nozzles were located above the tipping floor.⁴¹

NYCOSH identified two chemical products ("Product A" and "Product B") currently in active use for odor control, one at a transfer station and one at a MRF. Both products were labeled "odor counteractants" on their safety data sheets.⁴² NYCOSH did not determine whether these products are odor-neutralizing agents, as required, or are scent-masking agents. NYCOSH did conduct a preliminary review of several, but not all, of the chemical ingredients of these two products to determine whether their discharge into occupied work areas might raise exposure concerns.

Product A contains 5-10% ethoxylated nonyl phenol⁴³ and 1-5% acetic acid, 2-ethylhexyl ester,⁴⁴ among other ingredients.

40 Training should be provided if H₂S may originate from an environmental source such as a dry well; training must be provided if H₂S may originate from a chemical product or process as per the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

41 The tipping floor is the area of a waste processing facility where incoming vehicles unload MSW into a pit or onto a floor and where MSW is temporarily stored prior to further processing or transfer.

42 A safety data sheet (SDS) is a required written or digital document for each hazardous chemical product used or stored on site. It provides information on the properties of each chemical product; the physical, health, and environmental health hazards; legal limits; protective measures; and safety precautions for handling, storing, and transporting the chemical. The OSHA Hazard Communication Standard (29 CFR 1910.1200) requires that SDSs be accessible on site by all workers. Fluency in understanding SDSs is part of the required hazard communication training. Training materials and methods appropriate in content and vocabulary to the educational level, literacy, and language of employees must be used.

43 CAS 9016-45-9.

44 CAS 103-09-3.

Review of safety data sheets for ethoxylated nonyl phenol in concentrated form (i.e., 98-100%), from multiple manufacturers, indicated a number of safety and health precautions, including but not limited to:

- Possible risk of harm to the unborn child, possible risk of impaired fertility.
- Respiratory or skin sensitization: prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.
- Eye Contact: slightly irritating if washed within 25 minutes; chemical burns on prolonged (24 hour) contact.
- Inhalation of mist may irritate with chest pain and discomfort.
- Wash hands thoroughly after handling; wash contaminated clothing and other protective equipment before storage or reuse.
- Avoid release to the environment.

Review of safety data sheets for acetic acid, 2-ethylhexyl ester in concentrated form (i.e., 98 - 100%), from multiple manufacturers, also indicated a number of safety and health precautions, including but not limited to:

- Causes serious eye irritation; may cause respiratory irritation.
- Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
- Prolonged or repeated exposure can cause edema, drying, defatting and cracking of the skin, and dermatitis.
- Symptoms of overexposure include headache, dizziness, tiredness, nausea and vomiting.

Product B contains 45% acetone.⁴⁵ Review of safety data sheets for acetone in concentrated form (i.e., 98-100%), from multiple manufacturers, again indicated a number of safety and health precautions, including but not limited to:

- Use only outdoors or in a well-ventilated area.
- Inhalation acute exposure effects: Vapor harmful. May cause dizziness, headache, watering of eyes, irritation of respiratory tract, drowsiness, nausea, and numbness in fingers, arms and legs. Inhalation of high vapor concentrations can cause central nervous system depression and narcosis. May lead to unconsciousness.
- Skin contact acute exposure effects: May cause skin irritation. Liquid is absorbed readily and can transport other toxins into the body. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
- Eye contact acute exposure effects: This material is an eye irritant. Causes itching, burning, redness and tearing. May cause corneal injury.
- Chronic exposure effects: Reports have associated repeated and prolonged overexposure to solvents with neurological and other physiological damage. May cause weakness, fatigue, skin irritation, and numbness in hands and feet.

The product safety warnings listed above pertain to these chemicals in concentrated form. The hazards associated with these chemical products may be somewhat mitigated by their deployment in dilute rather than concentrated form. Nevertheless, these particular chemical

⁴⁵ CAS 67-64-1.

***“We may** run a few lights here and there. We may go on the wrong side of the street because there is always a stop that is on the opposite side of the street. Sometimes the driver doesn’t always want to go around the block, so he will go on the wrong side. To save time.”*
- **Helper**⁴⁸

ingredients still introduce avoidable health risk. Their deliberate airborne dispersion into occupied spaces where they are available for inhalation by unprotected workers on a regular and ongoing basis, and their exhaust into the external environment, is inappropriate, is likely to be unnecessary, and should be avoided.

Odor control chemical products – Requirements and best practices for employers

Odor-neutralizing agents should be deployed directly into the exhaust air stream so they do not have an opportunity to enter the general work environment.

The chemical composition of odor-neutralizing agents should be vetted by a qualified, competent health and safety professional before purchase and deployment. There should be a deliberate proactive effort to identify and use the safest, least toxic, effective products that are available, for the protection of both the workforce and the surrounding community.

Ergonomic hazard – Fatigue

Twenty to forty percent of commercial vehicle crashes are caused by occupational fatigue, resulting in over 15,000 fatalities annually and \$12 billion in lost productivity and property damage. Occupational fatigue is caused by working long hours, by working with intense physical or mental effort, by having inadequate access to rest or recovery time, or by working during some or all of the natural time for sleep (i.e., nights). Fatigue is characterized by a lack of energy and motivation. Fatigue is a natural response to physical and mental challenges; under ordinary circumstances, sufficient quality sleep can serve to replenish temporary physical and mental deficits. Fatigue can adversely impact a person’s physical or mental capabilities, with ramifications for workplace and public safety. Fatigue can also have a long term impact on worker health. (111)

NYC commercial waste collection drivers and helpers consistently work long hours without rest breaks or meal periods. In a recent small survey, 85% of non-union drivers and helpers reported that they often (as distinguished from sometimes or never) work long hours, ranging from 9 to 19.5 hours per shift⁴⁶ and up to 75 hours per week.⁴⁷ Eighty two percent often or sometimes do not get or are unable to take meal breaks; 54% often or sometimes fall asleep while working. (3)

A NIOSH meta analysis⁴⁹ of 52 studies found that working long hours was associated with a reduction in cognitive function and an increased rate of injury. The ninth to twelfth hours of work were associated with decreased alertness, increased fatigue, reduced cognitive function, declines in vigilance on task measures, and increased injuries. Comparison of 8- and 12-hour schedules during day and night shifts found that 12-hour night shifts were associated with increased physical fatigue and with increased tobacco and alcohol use. Heavy workloads during 12-hour shifts provoked increased discomfort and deterioration in performance as compared with shorter shifts. (75)

Federal Motor Carrier Safety Administration (FMCSA) data indicate a “strong and consistent” pattern of increase in crash odds with increases in driving time. The statistical likelihood of a crash is highest in the eleventh hour of driving; however, there is a consistent increase

⁴⁶ Mean = 11.75; median = 13.

⁴⁷ Mean = 49.38; median = 52.

⁴⁸ Some carting firms “engage in ... measures such as reverse moves, illegal right turns on red, and even the blatant disregard of one way street restrictions.” (100)

⁴⁹ A meta analysis is a method for systematically combining data from multiple studies to develop a single conclusion that is statistically stronger than the analysis of any single study, due to increased numbers of subjects, greater diversity among subjects, and/or accumulated effects and results.

after the fifth hour and through the eleventh hour. When rest breaks occurred during a trip, the odds of a crash were reduced. (164) FMCSA concludes that “long work hours, both daily and weekly, lead to reduced sleep and, in the absence of sufficient recovery time, chronic fatigue. Fatigued drivers have slowed reaction times and a reduced ability to assess situations quickly... Commercial motor vehicle drivers (like most other people) are unable to assess their own fatigue levels accurately and are, therefore, often unaware that their performance has degraded.” (165)

Fatigue – Requirements and best practices for employers

Employers who engage in interstate commerce must comply with the requirements of the Federal Motor Carrier Safety Administration, which limits commercial non-passenger driving to a maximum of 11 hours after 10 consecutive hours off duty.⁵⁰ (166) Employers who do not engage in interstate commerce should consider FMCSA hours of service limits as guidelines and should ensure that neither work assignments nor actual work hours exceed FMSCA limits.

Employers must pay overtime to employees who work in excess of 40 hours in a payroll week. Overtime payment must be paid at a rate of one and one-half times the regular, “straight-time” hourly rate of pay. Employers must pay employees the regular “straight-time” hourly rate of pay if they work through meal periods; if they work through meal periods after they have already worked 40 hours in a payroll week, they must be paid at the overtime rate.

“You have a route that you know you can’t get done following the law.”

– **Union organizer,
former commercial
waste worker**

⁵⁰ Off duty means to not be performing or being responsible for performing any work in the capacity, employ, or service of a motor carrier or other employer, and to be at liberty to leave the vehicle or work premises to pursue activities of one’s own choosing.

FATALITY REPORT – EXCESSIVE HEAT

Aldero Cosme, sorter, 64

Died July 19, 2013, Brooklyn NY

Aldo Cosme was a sorter at the Cooper Tank Recycling transfer station on Maspeth Avenue in Brooklyn. During a week-long National Weather Service heat advisory, he collapsed and died on the job from heat illness. The outdoor temperature on that day was over 90 degrees, with a heat index of over 100 degrees. An OSHA investigation determined that Mr. Cosme had been exposed to excess heat in the transfer station caused by a combination of elevated outdoor temperatures and heat generated by transfer station equipment.

OSHA called Mr. Cosme's death "a needless and preventable loss of life." The agency noted that Cooper Tank Recycling did not train employees to recognize, prevent, or treat heat-related illness. The employer did not have a general heat stress management program to protect workers. Specifically, it did not take measures to reduce temperatures in the work area and did not implement a work-rest regimen to prevent heat illness. Other elements of a heat stress management program include developing procedures to be followed in heat-related emergency situations, ensuring that workers can drink a cup of water every 15 or 20 minutes, providing a cool, climate-controlled area where heat-affected workers can take breaks or recover when signs and symptoms of heat-related illness are recognized, and ensuring that first aid will be administered immediately when symptoms of heat-related illness are recognized. (130)

During OSHA's investigation of Mr. Cosme's work-related death, the agency also found that Cooper Tank Recycling workers were exposed to falls of 20 to 40 feet due to missing guardrails and openings in walls. Workers were also exposed to electrocution hazards "from an ungrounded electrical outlet and power cord" and to "lacerations and amputations from unguarded grinders." (71)

Ergonomic hazard – Work-related musculoskeletal disorders

Ergonomics is the scientific study of people at work. The goal of ergonomics is to reduce stress and eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks. This is accomplished by designing tasks, work spaces, controls, displays, tools, lighting, and equipment to fit the employee's physical capabilities and limitations. (82) Musculoskeletal disorders (MSDs) are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and supporting structures of the upper and lower limbs, neck, and lower back. MSDs are caused or exacerbated by sudden exertion or by prolonged exposure to physical factors such as repetition, heavy lifting, force, vibration, or awkward posture. (82)

Drivers, helpers, sorters, and heavy equipment operators in MSW work are at significantly elevated risk of musculoskeletal injuries due to the nature of their work.

Ergonomic risk factors during waste collection include lifting, twisting, reaching, dumping and tossing heavy bags, bins, and containers' and repeatedly climbing in and out and on and off vehicles. Manual sorting activities at transfer stations and MRFs entail repetitious lifting, reaching, and twisting motions. The collection tasks of drivers and helpers in particular are characterized by a high frequency of heavy lifting and forceful movement of loaded carts and containers on a regular basis over extended work shifts. Collection crews lift, on average, over

13,000 pounds per worker per day. (145) Some NYC commercial waste drivers and helpers who work for low-road employers report lifting almost double that amount over hundreds of collection stops per shift. Non-union drivers and helpers participating in a small survey reported they work between 25 and 625 distinct collection locations per work shift.⁵¹ (3)

Collection tasks routinely and repetitively require work above shoulder level, heavy lifting, frequent exertion of force, static contractions, and extreme joint positions, all of which are risk factors for musculoskeletal disorders of the neck, shoulders, arms, and lower back. During lifting as well as pushing and pulling, the spine is subjected to both compression⁵² and shear⁵³ forces. Throwing of waste bags generated the highest risk of spinal injury. (141) Among Danish waste collection workers, the most commonly musculoskeletal injuries occurred in the back (14.9%), knee (12.3%), hand (12.3%) and foot (11.4%). (51)

Musculoskeletal disorders are the most common work-related injuries in the American solid waste industry. (135) DSNY workers reported regular engagement in strenuous physical activities, including heavy lifting, bending, twisting and reaching, and operating heavy equipment. Half reported work-related back pain for one week or longer in the prior year; 26% reported lost work time of at least 7 work days because of back pain; 70% reported discomfort in their hands, wrists, or fingers for a week or longer in the prior year. Forty nine percent were always or often physically exhausted after work; 60% loaded 11 or more tons per day. (60) Among MSW workers nationally, virtually all parts of the body were involved in musculoskeletal injuries, including the back (20%), hand (12%), shoulder (10%), knee (8%), leg (6%), ankle (6%), arm (5.5%), groin/hip (4%), foot, (3.5%), wrist (3.5%), and neck (3%). Lifting of heavy objects was the leading cause of injuries. "This can be attributed to the fact that most waste containers are manually loaded by workers; in addition, mechanically loaded containers occasionally have to be pushed or pulled through some distance to be loaded because waste hauling vehicles may not be in close proximity to where the waste containers are located... As a result of the magnitude of the force exerted on different parts of the body... it is no surprise that sprains and strains (particularly of the back) constituted the most common type of injury experienced by solid waste workers." (135)

Ninety one percent of non-union drivers and helpers participating in a small survey reported they often perform heavy lifting; 83% that they often push or pull heavy loads; 79% that they often twist and turn the torso; 76% that they often reach above their shoulders or below their knees; 86% that they perform repetitive motions; and 55% that they have strained, pulled, or dislocated a muscle or joint. (3)

Sorters are also exposed to significant ergonomic risk factors. They manually separate recyclables from waste streams on rapidly moving conveyor belts. They stand throughout their work shift, perform rapid repetitive motions, and use twisting, reaching, and other awkward postures putting themselves at risk of back and upper limb injury. (61),

Work-related musculoskeletal disorders – Requirements and best practices for employers

Solid waste work is heavily reliant on intensive manual labor, with exposure to a variety of ergonomic risk factors that over time can cause a range of musculoskeletal injuries. Addressing ergonomic risk factors in solid waste work requires changes to improve the fit between the demands of work tasks, processes, and equipment, on the one hand, and the physical

⁵¹ Mean = 241; median = 200.

⁵² Compression is a squeezing or pressing force that acts along the vertical axis of the spine to unnaturally flatten the disks and vertebrae.

⁵³ Shear is a force that acts perpendicular to the vertical axis of the spine creating the tendency of disks and vertebrae to slide horizontally away from their normal axis. If the shear forces are great enough, ligament and disk tears may result as well as shear fractures of the vertebrae.

capabilities and limitations the work force, on the other hand. The two primary approaches for prevention or reduction of musculoskeletal injury are engineering controls and administrative controls. Engineering controls can include “rearranging, modifying, redesigning, providing or replacing tools, equipment, workstations, packaging, parts, processes, products, or materials. Administrative improvements, such as job rotation, can help reduce workers’ exposures to risk factors by limiting the amount of time workers spend on ‘problem jobs.’ However, these measures may still expose workers to risk factors that can lead to injuries. For these reasons, the most effective way to eliminate ‘problem jobs’ is to change them. This can be done by putting into place the appropriate engineering improvements and modifying work practices accordingly.” (76)

Employers should, at a minimum, comply with the ergonomic guidelines of the American National Standards Institute (ANSI) for waste transfer stations and for MRFs. (5, 8) These ANSI standards address work station design features that take into account “bio-mechanical (ergonomic) considerations” such as conveyor belt working height above the standing surface, conveyor belt width, and conveyor belt speed limits (“average burden flow rate”). The standards call on employers to “evaluate and manage safety-related issues” through a safety program. The safety program should include, but is not limited to:

- A **hazard assessment** in which the employer conducts a review of the various equipment, systems, processes, and functions within the facility and the hazards associated with them, including sampling or measurements, where appropriate, to the type of hazard, as well as the persons who may potentially encounter these hazards;
- An **evaluation** of the means and methods of controlling the hazards identified in the hazard assessment, including information such as industry and regulatory requirements, instructions for the operation, inspection and maintenance of equipment, literature, surveys and professional consultations appropriate to the hazards that are identified;
- A **written program**, based upon the hazard assessment and evaluation, to include procedures for the operation, inspection and maintenance of equipment, prohibited practices, record keeping, training requirements and normative references to documents, such as operating manuals, that are relied upon and may be required as part of that program;
- A **program**, including training, for the implementation of the written program; and Periodic **reviews** and program revisions as necessary to ensure the effectiveness of the safety program.

The ANSI guidelines for solid waste worker ergonomics training include:

- Employers shall provide training to ensure that employees are sufficiently informed about potential ergonomic risk factors to which they may be exposed so that the employees may be able to participate in their own protection.
- Training shall be provided to all affected employees and their immediate supervisors.
- Training shall include at a minimum:
 - Employer’s ergonomics/medical management program;
 - Awareness of potential risks;
 - Recognizing and reporting causes, symptoms;
 - Prevention and treatment;
 - Tools: care, use and handling techniques;

- Guards and safety equipment;
- Body mechanics, lifting techniques and devices;
- Work methods/procedures;
- Sorting station features; and
- Job/task rotation.

The ANSI standards, although aimed at waste transfer stations and MRFs, should be used by waste hauling companies as templates to evaluate and address ergonomic risk factors in the collection process and to guide an ergonomics training program for drivers and helpers.

Physical hazard – Occupational noise

Noise-induced hearing loss (NIHL) is an irreversible but entirely preventable sensorineural⁵⁴ condition in which decreasing auditory acuity results from exposure to elevated levels of unwanted sound (i.e., noise). NIHL differs from age-associated hearing loss (presbycusis), which is a naturally-occurring phenomenon that often can be medically corrected or mitigated. NIHL is caused by permanent damage to nerve cells of the inner ear; it cannot be corrected by surgery or other medical treatment or with a hearing aid. It can severely compromise the ability to hear and understand speech and to participate in interpersonal communication, and can provoke psychological and social isolation. Additional health impacts of occupational exposure to elevated levels of noise include headache, fatigue, physical and psychological stress, and cardiovascular impairment. Both noise-induced hearing loss and the elevated sound levels that cause it can reduce productivity, interfere with communication and concentration, and contribute to workplace accidents and injuries by making it difficult to hear warning signals. (115)

MSW workers are exposed to elevated noise levels from collection vehicles, compactors, front end loaders, conveyor belts, shredders,⁵⁵ and sorting equipment. During NYCOSH site visits to transfer stations and MRFs, conversation with a person two to three feet away was often impossible without shouting, a reliable indication that noise in the work environment is approaching or surpassing the OSHA 8 hour permissible exposure limit (PEL) of 90 decibels (dB).⁵⁶ When noise exposures exceed the PEL, OSHA requires that employees wear hearing protection and that employers implement feasible engineering or administrative controls to reduce noise exposures. When noise exposures exceed 85 dB, OSHA requires employers to make hearing protection and audiometric testing available. Occupational noise levels measured by researchers in three MRFs were found to be 83 dB, 94 dB, and 88 dB in pre-sorting (receiving) operations and 84 dB, 97 dB, and 85 dB in sorting operations, respectively. (61) One major source of occupational noise in technologically sophisticated MRFs is the use of compressed air in optical sorting units. The noise generated by compressed air is caused by turbulence that results from the introduction of high-velocity air streams into relatively still surrounding air. Additional turbulence is created as the compressed air blows against recycling materials and parts or sections of the machinery. (85)

Both the U.S. Environmental Protection Agency and the World Health Organization have determined that onset of noise induced hearing loss may begin to occur at sound intensity levels of 70 dB. (169,185) The sound intensity level at which OSHA requirements for hearing protection

⁵⁴ Sensorineural hearing loss is associated with disease-induced change in structures within the inner ear or in the acoustic nerve, often caused by noise damage. A sensorineural hearing loss results when there is dysfunction in either the perception or the interpretation of sound waves.

⁵⁵ Shredders are mechanical devices used for size reduction of MSW, i.e., to break up solid waste and recoverable materials into smaller pieces.

⁵⁶ Decibels are logarithmic units of measurement of the intensity of sound. An increase of 3 decibels represents a doubling of sound level intensity (87 dB is twice as loud as 84 dB); a decrease of 3 decibels represents a halving of sound level intensity (87 dB is half as loud as 90 dB). An increase of 10 decibels represents a 10 times increase; 20 decibels a 100 times increase; 30 decibels a 1,000 times increase.

are triggered is 85 dB. Of non-union drivers and helpers responding to a small, non-scientific survey, 91% reported that their employers do not offer hearing protection to workers. (3)

Occupational noise – Requirements and best practices for employers

Employers must comply with the requirements of the OSHA Occupational Noise Exposure Standard, 29 CFR 1910.95. When the OSHA permissible exposure limits (PELs)⁵⁷ for noise are exceeded, “feasible administrative or engineering controls shall be utilized” to reduce noise levels.

This means following the hierarchy of controls of hazards to eliminate or reduce potential sources of noise by substituting quieter processes, parts, and equipment. For example, compressed air noise might be effectively controlled by reducing the air velocity to as low as practical while maintaining performance requirements and/or by treating all open-ended discharge lines and ports, including standard air jets and nozzles, with commercially-available “quiet-design” nozzles or pneumatic silencers. (85)

If engineering and administrative control measures cannot reduce sound levels to within the PELs, the employer must provide personal protective equipment in the form of hearing protective devices (HPDs), such as earplugs or ear muffs, to reduce worker noise exposures to within the PELs.

When worker noise exposure equals or exceeds 85 dBA averaged over 8 hours, the employer must implement a hearing conservation program, including a noise monitoring program, notification to workers of their exposures, making audiometric testing and results available, and providing hearing protective devices. Employers must train affected workers annually. Training must cover: the effects of noise on hearing; the purpose, proper use, and advantages and disadvantages of HPDs; the purpose of audiometric testing and an explanation of test procedures and results; and worker rights under the occupational noise exposure standard. The employer must use training materials and methods appropriate in content and vocabulary to the educational level, literacy, and language of employees. A copy of the standard must be posted in the workplace.

Employers must also comply with NYC Local Law 113 of 2005 which requires that a refuse collection vehicle must not be louder than 80 dBA, when operating in compacting mode but not engaged in compacting an actual load, measured at a distance of 35 feet from the vehicle. Between 11 PM and 7 AM, if the vehicle is operating with 50 feet of a residential property the sound level generated by both collection and compacting activities must not exceed 80 dBA measured at a distance of 35 feet from the vehicle. (63)

Safety hazard – Caught-in

This report defines caught-in incidents as injuries and fatalities that result from a worker being squeezed, caught, crushed, pinched, or compressed between two or more objects, or between parts of an object. This includes individuals who get caught or crushed in operating equipment, between other mashing objects, or between two or more moving objects. MSW drivers and helpers are exposed to caught-in hazards from collection vehicle hoppers and compactors. Workers in waste transfer stations and MRFs are exposed to caught-in hazards from conveyor belts, shredders, compactors, and balers.⁵⁸ In 2013, a waste worker was crushed to death in the compactor of a waste collection truck in Brooklyn. In a recent small survey, 41% of non-union drivers and helpers reported they are sometimes caught in sorting, crushing, or other types of machinery. (3)

57 90 dBA averaged over 8 hours; 92 dBA averaged over 6 hours; 95 dBA averaged over 4 hours; etc.

58 A baler is a machine used to compress materials, with or without binding, to a dense form in a uniform shape and size that will support handling and transportation as a self-contained unit.

AMPUTATION REPORT – CRUSHED BY INSECURE CONTAINER

John Doe, helper (name disguised to protect against retaliation)

Injured winter 2015

John Doe, a helper for 2 years with a licensed New York City commercial waste collection company, suffered a partial finger amputation while working his usual route. He had worked a typical 15 hour shift from 9 PM on Sunday until noon on Monday. His next shift began at 8 PM Monday. At 8:30 AM on Tuesday, twelve and a half hours into his shift, he was attaching the customer's 2 yard container of refuse, which can weigh 1500 pounds or more, to the rear of the collection vehicle.

A typical container looks like this first photo right.

Note the projecting trunnion bar which is used to attach the container to the truck so that its contents can be dumped into the hopper and then compacted.

During normal operation, the container is attached to the rear of the truck with a cable. A winch pulls the container toward the truck so that its trunnion bar drops into the holding brackets. Safety bars are then locked in place to hold the trunnion bar in position. As the winch raises the container, the container pivots on the trunnion bar and the garbage is transferred from the container to the compacting unit. (184)

At this particular refuse pickup point on John Doe's route, the container which the waste collection company provided to the customer looked like this looked like this second photo from the top.

Note that the end of the trunnion bar (circled) had either broken off or been illegally modified. Note also that the container reportedly was provided in this condition to the customer by the collection company. In this photo, NYCOSH has obscured the Business Integrity Commission number stenciled on the container so that neither John Doe's employer nor John Doe can be identified.

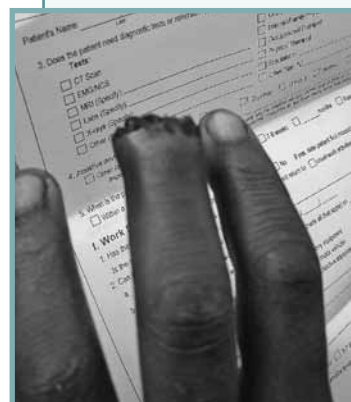
John Doe states that either the customer or the worker can report defective or damaged waste containers to the collection company; however, in his experience, worker reports are not taken seriously by the employer.

When Mr. Doe attempted to position the container on the rear of the truck to discharge its contents into the hopper, the defective trunnion bar could not be secured in place and the container slipped, almost completely amputating John Doe's finger, third photo right.

John Doe immediately asked to be taken to a hospital emergency room. Instead, so that additional time would not be lost from the waste collection route, he was dropped off at a nearby nursing home (i.e., a facility that provides residential care for the aged or chronically ill). When John Doe finally made it to a hospital emergency room, the partially severed tip of his finger had to be surgically amputated.

The employer tried to discourage John Doe from filing a workers compensation claim; nevertheless, he obtained an attorney and the case is pending. NYCOSH filed a Freedom of Information (FOIA) request with OSHA to determine whether the employer had reported the partial finger amputation and hospital visit to the agency, as required. OSHA responded that it has no record of any such notification or incident. (133)

Months later, John Doe is not yet back at work. Here is what his finger looks like, bottom photo right.



***“There is no
seat belts for the
person in the middle.
Sometimes no seat
for the person
in the middle.
Sometimes the seat
belts don’t work.”
- Helper***

Any machine part, function, or process which may cause injury must be safeguarded. A machine guard is a protective shield, device, or procedure that prevents body contact with moving parts of a machine or other equipment. Dangerous moving parts may be present at the point of operation, where work is performed on the material; in the power transmission apparatus, including flywheels, pulleys, belts, couplings, cams, chains, cranks, and gears; and in all other parts of the machine which move while the machine is operational.

Caught-in – Requirements and best practices for employers

Some compactors, shredders, and balers may be confined spaces. Employers must comply with the requirements of the OSHA Permit-Required Confined Space Standard, 29 CFR 1910.146. In addition, employers must comply with the requirements of the OSHA Control of Hazardous Energy Standard (lockout/tagout), 29 CFR 1910.147.

All exposed moving parts of conveyor belts, other than the belts themselves, must have machine guards, per the OSHA Machine Guarding/General requirements for all Machines Standard, 29 CFR 1910.212. Continuously accessible conveyor belts should be equipped with emergency stop cables that extend the entire length of the conveyor belt to allow access to the cable from any point along the belt.

NIOSH recommends that compactors and balers be equipped with point-of-operation guards to prevent workers from reaching into an operating machine. All machines should be equipped with safety interlock devices such as a sustained manual pressure control⁵⁹ that will immediately stop if the controls of the interlock device are released. Compacting and baling equipment and any attached conveyors should be interconnected so that a single lockable device can be used to de-energize and isolate the power to both machines. In addition, all emergency stop devices should be interconnected so that the activation of any emergency stop will shut down both the conveyor and the compactor or baler. The employer should provide machine guard training for workers that covers the hazards associated with particular machines; the function and operation machine guards and the specific hazards they protect against; how and under what circumstances safeguards can be removed, and by whom; and what to do if a safeguard is damaged or missing. Training should also cover standard operations for dealing with jams in conveyor belts and other equipment. (74)

Safety hazard – Struck-by

“Possibly the most dangerous piece of equipment is the collection truck.” (28)

This report defines struck-by incidents as injuries and fatalities that result from the forcible contact between a worker and equipment, a vehicle, a material, a surface, or an object. The contact or impact may be caused either by uncontrolled movement of the object or by involuntary movement of the worker.⁶⁰

In Massachusetts in 2009, a helper was killed when he fell off the riding step⁶¹ on the rear of his moving refuse collection truck. He was part of a three-person work crew assigned to a collection truck with two seats inside the truck’s cab.⁶² Although he was using the grab bar,⁶³

59 A sustained-manual-pressure control is a control device that requires continuous pressure by the operator to allow the machine or equipment to operate.

60 DSNY vehicles were involved in 2,412 collisions in fiscal year 2014. (91) Comparable data are not available for commercial waste vehicle collisions; however, it is reasonable to expect that they were involved in a similar or greater number of collisions.

61 A riding step is a platform mounted on the outside of the vehicle body of a collection truck for the helper to stand on while the truck is moving at very slow speed for very short distances between collection points.

62 In the industry, the cab of a truck with an inadequate number of seats or seat belts is known as the “dog house.”

63 A grab bar, or handhold, is an attachment on the outside of the vehicle body of a collection truck for the helper to grasp while using the riding step.

he fell from the back of the truck when it hit a pot hole while travelling at about 30 miles per hour. The helper died after hitting his head on the asphalt. (68) NYC waste collection workers interviewed by NYCOSH reported that grab bars and riding steps on their trucks are in varying states of disrepair. They routinely ride on the outside of their trucks in order to save time and because some trucks lack seats and/or seatbelts. They stated that drivers often speed because of productivity pressures. They also provided anecdotal, unconfirmed accounts of helpers on riding steps being struck by adjacent vehicles and of helpers falling off while the truck is in motion. In a recent small survey, 83% of drivers and helpers from five non-union NYC commercial waste hauling companies reported that their vehicles are often or sometimes in unsafe condition; 69% reported that they are often or sometimes struck by vehicles, equipment, materials, or falling debris. (3)

The NYC worker fatalities and the amputation that are highlighted in case studies in this report include instances of struck-by a falling container and a falling dumpster, struck-by a stationary object while attempting to gain control over a runaway collection truck, and struck-by the raised bucket of a front end loader. In each of these cases, the employer failed to implement required or recommended feasible and proactive measures to prevent, eliminate, or reduce the hazardous conditions that directly caused these workers' deaths.

Struck-by – Requirements and best practices for employers

Current OSHA regulations do not specifically address MSW collection vehicles. However, American National Standards Institute (ANSI) consensus standard Z245.1-2012 states that an automatic neutral position interlock "shall be required on all vehicles equipped with an automatic transmission, if the throttle is advanced by means of an external control located outside the cab of the vehicle." (7)

FATALITY REPORT – RUN OVER BY WASTE COLLECTION TRUCK

Thomas Guzzardo, driver, 52
Died Dec. 11, 2009, Brooklyn NY

On December 11, 2008, Thomas Guzzardo, 52, a driver for Chambers Paper Fibers Corp. was crushed to death between his runaway waste collection truck and a parked van. His rear-loading compacting garbage truck was parked at the customer's premises in Brooklyn while customer employees loaded and compacted waste cardboard boxes in the truck hopper at the rear. Mr. Guzzardo was exiting the cab of the truck when the transmission unexpectedly engaged and the truck began to move forward under power. He apparently attempted to stop the truck but was killed as the truck struck another vehicle before he could reenter the cab. According to his family, Mr. Guzzardo had been a driver for 26 years and had an unblemished safety record.

The OSHA investigation found the truck was not equipped with a neutral position interlock on the automatic transmission to prevent the transmission from going into the drive position while the throttle was automatically advanced during compacting operations. The truck's automatic transmission is placed in the neutral position during compacting operations and the power take off (PTO) automatically increases the RPM of the truck's engine to pump hydraulic pressure and cycle the packer panel (blade). Materials loaded into the truck's hopper are pulled upwards into the body of the truck to complete the cycle. Without a neutral position interlock the truck could accidentally engage the drive position and start moving.

In this case, [employer] failure to provide a neutral interlock caused an employee to be crushed when the automatic transmission engaged drive while the employee was standing next to the cab of the truck. (Note: this type of vehicle does not have a 'park' position.) The operator stayed with the truck as it veered into a parked van. The operator was crushed against the van before he fell to the ground. The truck continued down the street bouncing off parked cars until it was finally stopped by a chain of nine cars all parked on the side of the street. (122)

Speaking to a reporter, Mr. Guzzardo's daughter, Jennifer, 25, said that he had told family members two weeks before his death that his truck had been "lurching out of gear." She said that Chambers Paper Fibers must have known the truck was defective because "nobody wanted to drive that truck because they knew it had problems." (24)

The employer, Chambers Paper Fibers, failed to notify OSHA within 8 hours of the fatality, as required by law. (122)

Virtually all rear-loading collection trucks in the NYC commercial waste industry rev the truck engine when engaged in compacting operations. Per ANSI, these trucks should be equipped with automatic neutral interlocks to prevent them from accidentally engaging the transmission in drive mode during compacting operations. Further, even though no OSHA standard specifically requires automatic neutral interlocks, employers must provide them.

OSHA has issued citations for the absence of interlocks under the general duty clause,⁶⁴ section 5(a) of the Occupational Safety and Health Act of 1970. (122)

ANSI standard Z245.1-2012 also directs the employer to ensure that “no persons ride on steps when the vehicle is exceeding 10 mph, nor when the distance traveled exceeds 0.2 mile” between stops. This means that the employer is responsible for equipping each truck with a seat and a seat belt for the driver and all helpers. The employer must instruct and ensure that all helpers are seated and buckled in when the vehicle travels faster than 10 miles per hour or further than 0.2 mile. NIOSH recommends that employers “ensure that alternative transportation options are available for employees when there is not enough legal seating within a refuse collection truck’s cab for all work crew members.” (77) Further, DSNY has removed riding steps from all collection vehicles. (65) This simple measure alone would eliminate all helper falls from moving trucks and should be adopted throughout the industry.

ANSI also directs employers to ensure that “containers lifted, loaded, unloaded, or transported by mobile waste collection vehicles... are compatible with and capable of being lifted by the lifting device to be used.” (7)

Employers should also utilize additional available protective technologies for vehicle retrofits or new purchases, such as:

- Audible alarms to warn workers and pedestrians when in reverse gear.
- Supplemental convex mirrors mounted at the rear corners of vehicles to provide vision across the back.
- Closed-circuit television systems (“back-up cams”) to monitor the blind spot behind the vehicle.
- Infrared or ultrasonic sensing units to detect persons or objects in the path of a backing vehicle and activate an alarm inside the cab.⁶⁵ (110)

These protective devices are suitable for use on MSW collection trucks, front end loaders, and forklifts.

⁶⁴ “Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.”

⁶⁵ Back-up cams are in widespread use in personal vehicles. Sensors are being used successfully on school buses to alert drivers to children who enter the blind spots in front of the buses; sensors are also in use on refuse collection vehicles in some areas.



FATALITY REPORT – CRUSHED BY DUMPSTER

Robert Meehan, Jr., helper, 40

Died November 12, 2014, Staten Island, NY

Robert Meehan, Jr. reported to his job as a helper for Flag Container Services on Staten Island on November 12, 2014 and never came home. Mr. Meehan, 40, was killed on the job when a 6 cubic yard dumpster he was routinely loading onto the rear of Flag garbage truck number 22 fell on him, causing severe trauma to his head and torso and crushing him to death against a cinder block wall.

According to his relatives, Mr. Meehan had worked in commercial waste collection for four years and had moved to Flag Container Services because he was not offered sufficient hours at his previous job. Although he was an experienced truck driver, he was employed as a helper, not a driver. He did not have health benefits and his assigned work schedule varied on a daily basis. According to his sister, Mr. Meehan hoped to one day be hired at a unionized private sanitation company, one that offered good pay, benefits, and a pension. (154)

Mr. Meehan's death was not an "accident." Rather, it was completely preventable and unnecessary. The federal Occupational Safety and Health Administration (OSHA) noted in a citation that the employer, Flag Container Services, violated the law by failing to "furnish employment and a place of employment which were free from recognized hazards that were causing or were likely to cause death or serious physical harm to employees." Specifically, "the truck was not equipped with latching devices to secure the container trunnion bar to the dumping mechanism, leaving it susceptible to being pushed off the sill by the influence of waste items and/or the motion of the packer panel."

OSHA also issued citations for failure to "develop and implement a written safety program that provides for equipment inspection and maintenance, as well as information and training for workers on safe work practices for refuse collection." OSHA issued an additional citation for the absence of the required audible back-up alarm, thus "exposing helpers to the hazard of being backed over or crushed by the truck operating in reverse while they are outside the vehicle." Additional citations were issued because Flag did not document or report the fatality to OSHA, as required, and did not have a chemical safety program, did not have required chemical documentation (safety data sheets), and did not provide training about the compressed gases and flammable chemicals they handled on the job. (57,131)

A newspaper investigation revealed that Flag has corporate links with Formica Construction, with which it shares an office. William Formica Jr. is the principal executive officer for both Formica Construction and Flag Container Services, according to state Division of Corporations records. Formica has also been investigated by OSHA for an employee fatality. Delfino Velazquez, 43, was asphyxiated on November 28, 2014 in a building collapse during a Formica demolition operation. Formica did not have a permit to perform the demolition. Mr. Velazquez was Formica's second worker fatality. In 2003, Lorenzo Pavia was asphyxiated in the cave-in of trench that had no bracing or shoring. Kenneth Formica, William Formica Jr.'s brother and the company's owner, was convicted of criminally negligent homicide in the death of Mr. Pavia. (57)

Stressor – Lack of access to toilet facilities

Commercial waste drivers and handlers operators often complete long runs without reasonable access, or in some cases without any access, to toilet and washing facilities. Some yards⁶⁶ have well equipped and sanitary rest rooms, but others have filthy, poorly equipped, poorly functioning, or non-functioning, sinks and toilets. Some have temporary portable outdoor toilets⁶⁷ with no provision for soap or running water. Still others reportedly have no on-site toilets or running water at all.

Restroom access along the collection route is also restricted or non-existent. There may be no or few available restrooms located along the route. Many establishments with restrooms are closed late at night when collection occurs. Some open restrooms are not available to the public, while access by waste workers is discouraged at some publicly available restrooms.

Employees may suffer adverse health effects from inability to void due to lack of access to toilets when needed. Individuals can vary significantly in how often they need to urinate and defecate, depending in part upon medical condition, medications, diet, fluid intake, and environmental conditions. (116) Adverse health impact may occur from extended delays in defecation, including constipation, abdominal pain, hemorrhoids, and intestinal disorders. Forced retention of urine may cause urinary tract infections, more serious infections or, in rare cases, renal injury. (112) The effort of “holding it in” may make safe operation of a vehicle more difficult. Not responding to an extreme urge to urinate can result in temporary deterioration of cognitive function. The level of impairment can be equivalent to staying awake for 24 hours or having a blood alcohol level (BAC) of 0.05%. By comparison, it is a major violation to operate a commercial motor vehicle with a BAC of 0.04% or higher. (62)

Lack of access to toilet facilities – Requirements and best practices for employers

Employers must provide flushable toilet facilities “in all places of employment” so that employees can use them when they need to do so, per the OSHA Sanitation Standard (29 CFR 1910.141). Potable water⁶⁸ must also be provided for drinking and washing. Hand-washing facilities must have hot and cold, or tepid, running water and access to hand soap or similar cleansers and to clean paper or cloth towels or air blowers. Temporary portable outdoor toilets are permitted only if “the lack of water or temporary nature of the installation makes water carriage systems impracticable... and the portable toilets have adequate lighting, are secure, and have heating as necessary...”; and if the required hand-washing facilities are also provided. (117)

These requirements do not apply to mobile work crews when they are on the road (i.e., there is no requirement for a bathroom on a waste collection truck). However, the employer is responsible for ensuring that mobile employees have “immediate” access to “nearby” toilet facilities which meet the requirements of the standard, i.e., restrictions on access to toilets must be reasonable and must not cause extended delays. (116)

Employers can meet these requirements by providing proper toilet and washing facilities at their yards and by arranging rest room access at transfer stations and MRFs for waste collection drivers and helpers. Employers can also contract with their customers to provide bathroom access for drivers and helpers when they pick up customer waste.

“I was new on the job. The driver pulled over. We went to the back of the truck but there wasn’t nothing to pick up. He unzipped and did his business right there in the street. He told me ‘This is your bathroom break.’”

- Helper

⁶⁶ A yard is the reporting location where drivers and handlers pick up collection trucks at the start of the work shift and return them at the end of the work shift.

⁶⁷ OSHA calls these “non-water carriage toilet facilities,” defined as toilet facilities not connected to a sewer.

⁶⁸ Potable water means water that meets the standards for drinking purposes of the state or local authority that has jurisdiction, or water that meets the quality standards required by the U.S. Environmental Protection Agency’s National Primary Drinking Water Regulations (40 CFR 141).

Stressor – Wage theft

Wage theft is the illegal underpayment or nonpayment of wages or the denial of benefits that are rightfully owed to an employee.

Among non-union drivers and helpers responding to a small survey, 82% reported they sometimes or often do not get or are unable to use meal breaks; 63% reported they sometimes or never are paid all of the wages and overtime they have earned; 67% believed their hours worked are not properly recorded by the employer; 24% work a second job to make ends meet; and 9% receive public assistance. (3)

One mechanism that fosters wage theft is to obscure who the actual employer is by arranging for permanent employees to be paid by a temporary (“temp”) agency or other labor broker. This is often an attempt to shield the employer from legal liability for wage and hour or health and safety legal violations. An ongoing class action lawsuit against a licensed commercial waste hauler makes precisely this claim:

Plaintiffs allege that they are current and former waste removal workers, garbage collection helpers, and demolition laborers employed by a company or enterprise that they knew as “Five Star.” They contend that they were all subjected to defendants’ common pay practices and policies that violated the FLSA,⁶⁹ namely their failure to pay the prevailing wage for all hours worked and to pay overtime premiums for hours worked in excess of forty (40) per week. According to the Complaint, the defendants were joint employers and/or a single enterprise that employed plaintiffs and the purported collective action members and were responsible for establishing and implementing the alleged payroll policies at issue in this case. Defendants contest this allegation and aver that “each of the Company Defendants is a distinct and separate entity . . . engaged in separate businesses with their own employees.” They further contend that plaintiffs are not and have never been employees of Five Star Inc. or Five Star LLC... (168)

Another mechanism for wage theft is the deliberate omission of information such as rate of pay and hours worked from the employee’s wage statement (pay stub).

This non-union helper’s pay stub (with personal and employer identifiers redacted) from

PERSONAL AND CHECK INFORMATION			EARNINGS				
Soc Sec #: XXX-XX-XXXX Employee ID: [REDACTED]			DESCRIPTION	HRS/UNITS	RATE	THIS PERIOD (\$)	YTD HOURS
Pay Period: 07/11/15 to 07/17/15			Salary			700.00	15680.00
Check Date: 07/24/15 Check #: [REDACTED]			EARNINGS			700.00	15680.00
NET PAY ALLOCATIONS			TOTAL HOURS WORKED				
DESCRIPTION THIS PERIOD (\$) YTD (\$)			WITHHOLDINGS				
Check Amount 0.00 0.00			DESCRIPTION	FILING STATUS		THIS PERIOD (\$)	YTD (\$)
Chkg 7783 521.34 11980.05			Social Security			43.40	972.16
NET PAY 521.34 11980.05			Medicare			10.15	227.36
			Fed Income Tax S 1			77.96	1582.88
			NY Income Tax S 1			28.35	543.15
			NY Disability			0.60	17.20
			NY NYC Inc S 1			18.20	357.20
			TOTAL			178.66	3699.95
			NET PAY			THIS PERIOD (\$)	YTD (\$)
						521.34	11980.05

Payrolls by Paychex, Inc.

a commercial waste hauler indicates a weekly salary of \$700. This is his gross pay for this pay

69 The Fair Labor Standards Act establishes minimum wage, overtime pay, recordkeeping, and youth employment standards affecting employees in the private sector and in federal, state, and local governments.

period. His “salary” may be different on other pay stubs for other pay periods. However, this helper is an hourly employee, not a salaried employee. The number of hours worked and his hourly rate of pay can vary from day to day. Neither his hourly rate of pay nor the hours he worked in the pay period are specified. His work shift officially runs from 7 PM until 3 AM, or ostensibly 8 hours, including a meal break. However, he states that in reality it is not possible to finish the route and return to the yard before 4:30 AM at the earliest, i.e., at least 9.5 hours of work without a meal break. By withholding pertinent information such as hours, rates of pay, and overtime from the employee, the employer makes it virtually impossible for the employee to determine whether he is being paid in full.

Some carting employers do not begin to pay helpers until the collection vehicle leaves the yard. This means that if the helper reports to yard on time at the beginning of his work shift but, for example, the driver is 2 hours late, the helper is not paid for the time he spends at the yard waiting for the driver, even though he is on his work shift.

Hourly pay rates for helpers can vary from day to day. It is the practice of some employers to pay helpers a lower-than-usual wage if two helpers, rather than one, are assigned to a collection truck. These variable rates may not be reflected on the pay stub.

Another form of wage theft is to require workers to purchase their own personal protective equipment, or simply to fail to provide PPE so that workers must purchase it on their own if they want to be protected on the job. OSHA requires employers to provide appropriate PPE at no cost to their employees in most instances.

Commercial waste workers testified at an April 29, 2015 hearing of the New York City Council Committee on Sanitation and Solid Waste Management that they “are expected to provide their own gloves, boots and reflective gear, and receive little or no training.” (35) Among non-union drivers and helpers responding to a small survey, 91% indicated their employer did not provide hearing protection; 81% said their employer did not provide protective gloves; 94% reported their employer did not provide respiratory protection; 97% indicated their employer did not provide clothing to protect against weather extremes, including cold and rain; 44% said their employer did not provide high visibility (reflective) shirts or vests; and 84% reported having to purchase their own PPE. (3)

Wage theft – Requirements and best practices for employers

The employer must provide the employee with a wage statement (check stub) with each payment of wages. The wage statement must include:

- The employer’s name, address, and phone number.
- The employee’s name.
- The dates covered by payment (pay period).
- The basis of payment hourly, salary, etc.).
- The hours worked (straight time and overtime).
- Any allowances or credits.
- Gross wages.
- Any deductions from wages.
- Net wages. (109)

For work shifts of at least 6 hours that begin between 1 PM and 6 AM, the employer must provide a meal break of at least 45 minutes (60 minutes for factory work). The meal break

The employer must perform a job hazard analysis⁷⁰ per 29 CFR 1910.132(d)(1): “The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE).” OSHA explicitly requires that employers provide to employees at no cost the PPE that is necessary to protect against hazards identified by the required job hazard analysis.

- eye and face protection, when exposed to eye or face hazards from flying particles, liquid chemicals, acid or caustic liquids, chemical gases or vapors;
- respirators, to protect employees from exposure to air contaminants above an exposure limit or when otherwise necessary to protect employee health;
- a protective helmet or hard hat, when working in areas where there is potential for injury to the head from falling objects;
- protective footwear, when working in areas where there is a danger of foot injuries from falling or rolling objects or objects piercing the sole;
- hearing protective devices, if permissible noise exposure levels are exceeded and feasible administrative or engineering controls fail to reduce the noise level to below the PEL; and
- gloves, for protection against dermatitis, severe cuts or abrasions, or specific chemicals. (126)

70 A job hazard analysis is a procedure used to review a job, including process, equipment, and materials; identify potential hazards; and design actions and procedures to eliminate or control the hazards. Job hazard analysis is also called job hazard assessment.

CONCLUSION

SOME NYC COMMERCIAL waste employers continue to violate OSHA requirements and to ignore industry health and safety standards, free from significant consequence for their actions or inaction. Their workers and contractors, however, are not free from consequence. They continue to be unnecessarily and avoidably injured, maimed, and killed on the job due to the persistent indifference of these scofflaw employers.

The lengthy and sordid record of negligence and death at a Queens waste facility provides just one egregious example among many in the industry:

On August 17, 2005 a picker at the Regal Recycling Center in Jamaica, Queens was struck and killed on the tipping floor by the raised bucket of a front end loader. The cause of death was blunt impact of torso, head, and extremities. The employer did not have in place a program to address safe operating procedures and conditions for front end loaders. The driver of the loader had not been trained in how to operate the loader. The loader had a cracked windshield, obscuring the driver's vision. The windshield had been damaged for at least 3 weeks, without being repaired. Employees stated that instead of receiving training they "watch and follow what the other employees are doing." OSHA cited Regal Recycling for multiple violations, including violations of the respiratory protection standard. OSHA provided Regal with information as to how to correct the violations. (120)

On October 23, 2007, the NYC Department of Buildings (DOB) issued a violation⁷¹ to Regal for "occupancy contrary to Certificate of Occupancy... building being occupied as storage and sale of good cars, auto wrecking lot, and temporary frame offices... violation severity: hazardous."⁷²

On January 8, 2009, OSHA found that employees were using a corrosive that exposed them to potential third degree chemical burns and cited Regal for failing to provide employees with personal protective equipment (chemically protective gloves) and for violations of the respiratory protection standard (again). Regal had provided respirators but with the wrong cartridges, effectively leaving workers unprotected. In addition, respirator users were not trained, medically evaluated, or fit-tested, as required for their safety. The employer did not have emergency eyewashes. Cylinders of compressed oxygen were stored together with acetylene, creating an explosion hazard. Regal did not have a hazard communication (chemical safety) program in place and did not provide the required chemical safety training. Required precautions to protect against falls from heights were not in place. OSHA again provided Regal with information as to how to correct the violations. (124)

On June 29, 2009, two plumbing contractors and a Regal employee were overcome by hydrogen sulfide and asphyxiated after entering a dry well in the recycling center. The plumbers had been hired after another contractor refused the job because it was too hazardous. OSHA issued several serious violation citations to Regal for failing to restrict access to a permit-required confined space, for not having a confined space program, and

71 ECB violation #34616975R, infraction code BH7, section of law 27-217, DOB violation #102207C12GM01. On January 20, 2009, the violation was dismissed without penalty.

72 Regal was licensed by NYC BIC but did not have a legal C of O from NYC DOB for use of the space for a solid waste transfer station and recyclables handling and recovery facility.

for not providing confined space training. During the inspection, OSHA asked a Regal vice president if he had developed and implemented a respiratory program. The VP responded that he had not. The OSHA inspector reminded him that OSHA had previously provided him (4 years prior and 6 months prior) with templates for doing so and with references to consulting firms that could provide assistance. When asked why he had not acted on the information, the VP responded “I just didn’t get to it yet.” When asked why he had not proceeded (since the earlier citations) with medical evaluations or fit-testing to determine whether employees were able to wear respirators, the VP responded “I just didn’t get to it yet.” When asked why fall protection had not yet been installed, the Regal officer replied that he “simply had not gotten to it.” (125)

That the above fatal practices could persist over a multiyear period in which the perpetrator was cited multiple times by OSHA, also cited by DOB, and presumably licensed or relicensed by BIC, indicates the need for significant regulatory reform of the oversight process for New York City’s commercial waste industry. This need for stronger oversight is further reinforced by the apparent reluctance or inability of waste trade associations and higher-road employers to act to discourage or end the unsafe and illegal conditions and practices that are rampant among low-road, non-union operators engaged in a race to the bottom in the commercial waste industry.

Responsibility for waste industry regulation, oversight, and enforcement is shared by a medley of city, state, and federal agencies. These include the New York City Business Integrity Commission (BIC), which is responsible for approving or denying business licenses;⁷³ the New York City Department of Sanitation, which is responsible for waste standards and facility inspections;⁷⁵ the New York State Department of Labor, which is responsible for wage and hour violations; the federal Occupational Safety and Health Administration; and the Federal Motor Carrier Safety Administration, which regulates commercial vehicle safety.

The jurisdictional patchwork and lack of coordination among responsible governmental agencies means that although citations can be and are issued, illegal and hazardous conditions and practices continue. Organized crime in the commercial waste industry has been eradicated; disorganized crime persists.

There is increasing interest among diverse stakeholders in significant reform of the city’s commercial waste industry. Environmental justice organizations, labor unions, environmental activists, fiscal responsibility groups, community organizations, trade associations, and commercial waste customers are all advocating for various reform proposals, some overlapping and some competing. Mayor de Blasio has commissioned a study to “to determine if there are substantial inefficiencies in the way waste is collected and if so, [how to] ...reduce those inefficiencies and possibly create ancillary benefits such as improved recycling rates, working conditions, and wages.” (106) The New York City Council recently heard testimony from non-union commercial waste workers regarding low pay, lack of training, and hazardous conditions in the industry.⁷⁶ (34,182)

⁷³ As of October 2015, there were 247 commercial waste haulers licensed by BIC. Of the approximately 138,000 commercial customers listed in the BIC database, 48% are served by the 10 largest haulers; 67% are served by the 20 largest haulers; and 99% are served by the 100 largest haulers. Further, as of February 2016, there were 63 BIC-licensed trade waste brokers. Anecdotal reports indicate that brokers, with no investment in trucks or other infrastructure, are able to undercut established haulers, forcing collection fees downward and provoking a race to bottom with regard to wages, hours, working conditions, and worker health and safety. (92,102)

⁷⁴ BIC issued 883 violations to licensed private waste haulers in fiscal year 2014; it issued 203 additional violations to non-licensed private waste companies. (91)

⁷⁵ DSNY conducted 6,022 inspections of licensed private transfer stations in fiscal year 2014. (91)

⁷⁶ After the hearing, their employer fired the workers who testified. They were subsequently reinstated after intervention by City Council Sanitation Committee Chair Antonio Reynoso.

The commercial waste sector encompasses a complex web of legal arrangements, including licensing, permitting, contracting, leasing, public-private partnerships, and possibly in the future, franchising or trade waste districts. Each of these legal arrangements presents opportunities and challenges for integrating requirements for public health and for worker health into the current legal framework and/or into a future, restructured legal framework.⁷⁷

Nevertheless, the City retains broad power to regulate the commercial waste industry to further the protection of public health. The New York City Charter provides that the Commissioner of the Department of Sanitation “shall have charge and control of and be responsible for all those functions and operations of the city relating to the cleanliness of the streets and the disposal of waste, including ... the removal and disposition of ... garbage, refuse, rubbish and waste ... [and] plans, design, construction, operation, alteration, repair, maintenance, replacement, enlargement and regulation of the use of ... plants, facilities and equipment.”⁷⁸ NYCOSH calls on the City of New York to use its authority and influence to increase industry accountability and to protect the public health, including waste worker health and safety, in this dirty and dangerous trade.

⁷⁷ One possible legal challenge is OSHA preemption, which potentially bars some prequalification procedures implemented by state or local governments. In general, state or local laws that aim to protect workers specifically, and for which comparable OSHA standards exist, might be preempted. Laws aimed at protecting public health in general, which may include workers’ health, are not preempted. Further, local laws under which government is acting in its “proprietary interest” as an investor, owner, or financier (i.e., perhaps franchising) may not be preempted; local laws under which government is using its spending power “tantamount to regulation” (i.e., perhaps licensing) may be preempted. (142)

⁷⁸ City of New York. 2004. New York City Charter, as amended through July 2004. Chapter 31, § 753.

RECOMMENDATIONS

THE NYCOSH RECOMMENDATIONS that follow are public health policy recommendations, for industry reform. The goal of these recommendations is to prevent unscrupulous employers from undercutting social norms and legal requirements for wages, hours, working conditions, occupational health, and public health (and thereby gaining unfair market advantage). We urge the City to consider and to support and implement these public health recommendations in its current oversight process and in any comprehensive reform efforts to come.

Recommendation #1:

Workers who collect, transport, sort, and transfer municipal waste for recycling or disposal perform an essential public health service, often at great risk of injury, illness, or death.

Reform of the commercial waste industry should hold privately-owned waste operations to high environmental, social, and labor standards. Protection of worker health and protection of the public health must be integral components of the ongoing oversight process and of any reform efforts.

Recommendation #2:

New York City commercial waste employers continue to violate OSHA requirements and ignore industry health and safety standards, free from significant consequence for their actions or inaction. Their workers and contractors, however, are not free from consequence. They continue to be unnecessarily and avoidably injured, maimed, and killed on the job due to the persistent indifference of these scofflaw employers.

District attorneys should be assertive in initiating criminal prosecution of waste operators where evidence indicates that one or more fatalities was caused by purposeful disregard of a legal requirement or by employer action with plain indifference to employee safety.

Recommendation #3:

The jurisdictional patchwork and lack of coordination among responsible governmental agencies means that although citations can be and are issued, illegal and hazardous conditions and practices continue.

New York City Business Integrity Commission, New York City Department of Sanitation, New York State Department of Labor, New York State Department of Environmental Conservation, and Occupational Safety and Health Administration Region 2 should establish an interagency working group to share information and coordinate actions on complaints, conditions, violations, and enforcement in the commercial waste sector.

Recommendation #4:

As a condition of licensing or franchising or other administrative restructuring:

- New York City Business Integrity Commission should require applicant certification of compliance with applicable OSHA standards.⁷⁹

⁷⁹ Applicable OSHA standards include, but are not limited to:

29 CFR 1910 Subpart D - Walking-Working Surfaces

29 CFR 1910 Subpart E - Means of Egress

29 CFR 1910.95 - Occupational noise exposure

- New York City Business Integrity Commission should require applicant submission of records of health and safety training provided to management and non-management employees in the preceding 5 years. Records should indicate topic, length of training session, date of training session, names and job classifications of employees trained at each session, language in which the session was conducted, and name and title of the person conducting the training. (Many commercial waste workers report that their employers have never provided them with health and safety training. OSHA has issued numerous citations for failure to provide required training).
- New York City Business Integrity Commission should require applicant certification of compliance with New York State Department of Labor wage and hours laws, specifically with regard to hours of work, overtime, meal periods, and wage statements. (Wage theft, the illegal underpayment or nonpayment of wages or the denial of benefits that are rightfully owed to an employee, is rampant in the commercial waste industry).
- New York City Business Integrity Commission should require waste operators that contract work to certify that they retain responsibility for compliance with all applicable workplace. (Some commercial waste operators seek to evade legal liability for wage and hour or health and safety violations of law by arranging for permanent employees to be paid by a temporary ("temp") agency or other labor broker).
- New York City Business Integrity Commission should require strict adherence to Federal Motor Carrier Safety Administration hours of service limits for drivers of commercial vehicles, whether or not technically applicable. All hours worked above 40 hours in a payroll week must be paid at the overtime rate. (Drivers and helpers report frequently working extended shifts of up to 19 consecutive hours and averaging 12 consecutive hours. They often are not paid at the overtime rate for the extra hours worked, and in some instances may not be paid at all for the extra hours worked)..
- Waste collection operators with more than one collection vehicle and operators of waste transfer stations and materials recovery facilities should be required to provide sanitary bathrooms with an adequate number of flushable toilets, hot and cold running water, soap, and disposable towels or other sanitary provision for drying hands, at work locations where employees begin or end their shift. (Waste collection drivers and helpers work long hours without effective access to toilets or wash facilities at their work facilities or while out on a collection route. With no alternative, they often must resort to urination and defecation in streets and alleys, endangering the public health).

29 CFR 1910 Subpart H - Hazardous Materials
 29 CFR 1910 Subpart I - Personal Protective Equipment
 29 CFR 1910 Subpart I - Personal Protective Equipment
 29 CFR 1910.146 - Permit-required confined spaces
 29 CFR 1910.147 - The control of hazardous energy (lockout/tagout)
 29 CFR 1910.178 - Powered industrial trucks
 29 CFR 1910 1910 Subpart O - Machinery and Machine Guarding
 29 CFR 1910.1020 - Access to employee exposure and medical records
 29 CFR 1910 Subpart S - Electrical
 29 CFR 1910.1030 - Bloodborne pathogens
 29 CFR 1910.1200 - Hazard Communication.

- Waste collection operators with more than one collection vehicle and operators of waste transfer stations and materials recovery facilities should be required to provide locker rooms, employee lockers, and showers with hot and cold running water and soap. (Waste collection drivers and helpers wear their personal clothing to, from, and at work. They are not provided with work clothing and generally do not have access to change rooms, lockers, or wash facilities or showers. As a result, they cannot avoid bringing home work related contaminants on their skin and clothing, thus endangering family members, other residents, and riders of public transportation).
- New York City Business Integrity Commission should require that all compacting waste collection vehicles be equipped or retrofitted with a neutral position interlock to prevent the vehicle transmission from engaging in drive during compacting operations. (Waste collection vehicles may inadvertently engage in drive mode when the compactor is operated. Drivers have been killed as a result).
- New York City Business Integrity Commission should prohibit riding on the exterior of waste collection vehicles and should require the removal of riding steps, as DSNY has done since 2010. (65) BIC should require that waste collection vehicles be equipped sufficient legal seats and seat belts to accommodate the collection crew. If there are not enough legal seats and belts, alternate transportation should be required for the crew. (Use of riding steps to transport helpers while collection vehicles are in motion results in injuries and fatalities to helpers and contributes to vehicular collisions, thus endangering drivers and passengers of private vehicles).
- New York City Business Integrity Commission should require that collection vehicles be equipped or retrofitted with either closed-circuit television systems (“back-up cams”) or infrared or ultrasonic sensing units to detect persons or objects in the path of a backing vehicle or during the compacting cycle.

Recommendation #5:

The required rate of general ventilation in waste transfer stations and materials recovery centers should be increased as per the recommendation of DSNY’s 2004 Commercial Waste Management Study:

The fan capacity recommendation would surpass current Building Code standards. It would require increasing fan capacity from 6 air changes per hour (ACH) to 8 to 12 ACH and treating the exhaust air. Fans would automatically operate at 8 ACH with doors closed and at 12 ACH with doors open. The additional fan capacity addresses the practical reality that transfer station doors are generally open during operating hours when inbound and outbound traffic is heavy and consequently odors can be more readily released from the building. (96)

Recommendation #6:

New York City should conduct a public education campaign to encourage commercial and residential waste generators to practice source separation. This would have the dual benefit of increasing recycling rates and reducing exposures and injuries among municipal solid waste workers.

Recommendation #7:

Any restructuring of the waste trade industry should not occur at the expense of waste trade workers, whose jobs and standard of living must be not only protected but improved. Neither should any restructuring efforts be aimed at or have the effect of eliminating unions, restricting the rights of workers to join or form unions, or diminishing the obligation of employers to engage in collective bargaining with unions.

REPORT METHODOLOGY AND LIMITATIONS

NYCOSH REVIEWED Bureau of Labor Statistics wage data and injury, illness, and fatality data for North American Industry Classification System (NAICS) 562, waste management and remediation services.

NYCOSH conducted an establishment search on the OSHA website for every licensed carter, transfer station, and materials recovery facility in New York City and created a database of all OSHA violations since 2005. Using Freedom of Information Act requests, NYCOSH obtained and reviewed OSHA inspection reports and case files for citations pertaining to near misses, injuries, and fatalities.

NYCOSH toured three transfer stations and materials recovery facilities, where we had full access to observe and evaluate working conditions, equipment, and tasks. We interviewed managers and workers and reviewed chemical safety data sheets at these sites.

Requests to visit additional sites, including carter yards, were not granted.

NYCOSH did not have access to conduct environmental sampling (particulates, diesel emissions, carbon monoxide, volatile organic compounds, noise, etc.) at any site.

NYCOSH conducted eight focus groups of drivers and helpers. Fifty nine drivers and helpers provided written responses to a NYCOSH survey. NYCOSH conducted in-depth interviews with individual drivers, helpers, and sorters. Each interview lasted 1.5 to 3 hours. NYCOSH also reviewed worker wage statements (pay stubs).

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