

SOLID WASTE REDUCTION COUNCIL
HAZ-MATTERS:
AN OVERVIEW OF
HOUSEHOLD HAZARDOUS WASTE EVENTS



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INTRODUCTION

- In an effort to help our clients understand the concepts of a Household Hazardous Waste event (HHW), we like to spend time with them to give each person an idea of what all of this is about.
- We generally find that due to peoples extended understanding of chemical waste and toxicity based on today's exposure to things due to the internet, most people have a better grasp on what dangers are associated with chemicals and various waste products.
- Today, we will review some of the basic, yet essential points about Household Hazardous Waste to help:
 - Each participant and volunteer learn the basics to feel comfortable and knowledgeable of the “behind the scenes” needs of the team,
 - Make each person feel comfortable with Envirotec and our capabilities,
 - Make everyone feel safe AND act safely throughout the entire day

OBJECTIVES

- The objectives of this session is to provide a brief overview of what an HHW is, and how the waste that comes in is handled.
- As volunteers and employee participants, the level of exposure that you get is equivalent to what our professional staff experiences: the big difference is that we spend years training and maintaining our Levels of Competency so that we are always several steps ahead in our planning.

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• Today's objective is to have everyone involved in an HHW fully aware of some of the answers to the following questions:

- *Where the heck do we start?*
- *What are the rules and regulations that we need to know about?*
- *What type of things do we expect to see?*
- *Where does all of this stuff go afterward?*
- *Is this expensive?*

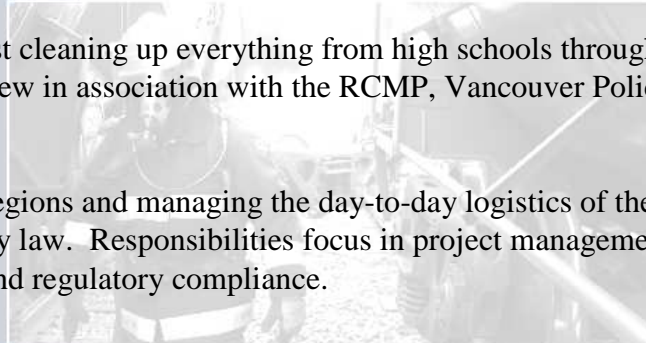
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ABOUT ME

- Chemist with 21 years' experience in the comprehensive management of hazardous materials.
- Spent the last 16 years or so as a HazMat Specialist cleaning up everything from high schools throughout western Canada to establishing BC's foremost Clandestine Lab cleanup response crew in association with the RCMP, Vancouver Police, the federal Organized Crime Unit, and Health Canada
- Duties include establishing waste services in all regions and managing the day-to-day logistics of the department, ensuring compliance with all federal, provincial, and municipal regulatory law. Responsibilities focus in project management in site remediation, hazardous materials management, emergency spill response, and regulatory compliance.
- My experience has specifically involved the hands-on management of several thousand waste characterizations and identifications throughout Canada and the United States.
- I provide training in Hazardous Waste Operations & Emergency Response, HAZWOPER 29CFR1910.120 (e) & (q) corporately and to clients in both the Canadian and International markets. Clients to date have included the University of Regina, various environmental consultants, members of the RCMP Clandestine Laboratory Unit in Vancouver, Manitoba Hydro, The O-PIPON-NA-PIWIN Cree Nation (OPCN), and the Solid Waste Management Company Limited (SWMCOL) in Port of Spain, Trinidad West Indies.
- Also train TDG and WHMIS throughout Canada
- Certified Canadian Environmental Practitioner, EP
- Canadian Environmental Certifications Approval Board Member

HAZWOPER 29 CFR1910.120 (e) & (q) Hazardous Waste Operations & Emergency Response Training



COURSE OVERVIEW

The HAZWOPER 29 CFR 1910.120 (e) & (q) course is a 40-hour course that provides the necessary knowledge and skills for workers involved in hazardous waste operations and emergency response. The course covers the following topics:

- Hazardous waste identification and characterization
- Site assessment and site control
- Decontamination procedures
- Spill response and containment
- Emergency response procedures
- Personal protective equipment (PPE) selection and use
- Safety and health hazards
- Environmental impacts
- Regulatory requirements
- WHMIS and TDG training

COURSE TRAINER

The course is taught by a highly experienced and qualified professional with over 20 years of experience in hazardous waste operations and emergency response. The course is designed to provide participants with the necessary knowledge and skills to perform hazardous waste operations and emergency response safely and effectively.



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WHERE THE HECK DO WE START?

- The biggest thing to remember when planning these is that you need to have a plan and area to do this that protects
 - People,
 - Property,
 - Environment
- Unlike most other industrial workplaces that we all encounter or work at, in this setting, we have babies, kids, parents, and grandparents all walking around together. To everyone that shows up, this is a great and fun opportunity to clear out the garage. To us, it's a workplace that is literally entrenched in hazards.
- NONE of these people have hardhats, steel toed boots, safety glasses, or most importantly, *AN UNDERSTANDING* of what is all around them, so our role is to protect the people that work there, that volunteer there, and that drop things off there.
- The only way that we can control this scene is to ensure that we establish the basics first, and then dive into the details of each area.

#1: Why do we want to have an HHW?

- Each year, millions of tonnes of hazardous materials (HazMat) end up in our landfills simply because most people don't know why this causes problems.
- Paints, chemicals, old medicines, all break down to create bi-products that when sitting in a regular landfill leach into the water table underneath the landfill, and eventually enter into the countries water ways. Even worse, when these are poured down our household drains, then enter directly into our community water treatment plants
- Eventually this gets into people either by direct ingestion/absorption/inhalation, or through the ecosystem that we interact with or eat (bioaccumulation)

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- The goal of an HHW is to allow people to do the right thing to not only protect their community, but to mitigate the problem from extending further into the environment
- There are over 80,000 chemicals in existence throughout all industries
- The truth is we simply Do Not Know what we Do Not Know about the effects most chemicals really have.
- Case in point is Bisphenol A (BPA) in plastic recyclable drinking containers
- An HHW helps prevent the spread of chemicals into our natural environment by allowing us to collect and process these chemicals in the proper and technical way needed.

#2: Who should we allow into this HHW?

- This community sponsored event is to help people within the community, and should focus on the people that live within the municipality that sponsors the event
- It does not apply to commercial waste, industrial waste, agricultural waste, or commercial waste, but to HOUSEHOLD materials
- Usually, most communities like to have a sign in sheet for their events which records the persons name and address, sometimes phone number.
- As a rule, any vehicle displaying a company logo will not be allowed to deliver any waste. Also, very large containers of waste (larger than 205 litre drums) are not allowed either

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#3: Where should we hold the HHW?

- Communities need to consider a few key factors when deciding where to hold an event like this, particularly:
 - How many people do we expect to show up?
 - Is the community asking for volunteers to work with Envirotec to help unload vehicles?
 - How will the line up of cars affect other community traffic?
 - Is there a way a car can pull out of line and leave if they don't want to wait?
 - Who is going to make sure that the people are all from this community?
 - Where can Envirotec put all of the waste and trailers during the event?
 - How does this event affect anyone else in the public?
- Typical places are
 - Large parking lots of community centres or malls,
 - Landfill
 - Fire halls
 - Municipal yards
- At all times, the focus on the set up has to concentrate on the flow of traffic, not due to the speed of passing people through dropping of waste, but for the **SAFETY** of all workers at the event

WHAT RULES AND REGULATIONS DO WE NEED TO KNOW ABOUT?

Federal Transportation of Dangerous Goods

Transport of Dangerous goods is regulated by the Federal Government which defines dangerous goods as “*any product, substance or organism included by its nature or by the regulations in any class listed in the schedules*”. Its purpose is to promote public safety and environmental protection while transporting dangerous goods. It also provides a uniform system of classifying dangerous goods and provides information on how to respond to dangerous occurrences such as spills. These regulations apply:

- to all modes of transport: highway, rail, marine and air
- to Shippers and Carriers involved in the transportation process
- in all jurisdictions: Federal, Provincial and Municipal

Everyone who handles, offers for transport and/or transports dangerous goods is responsible for making sure the goods are transported safely to their final destination. All people involved should:

- understand the hazards of each class of dangerous goods,
- recognize the hazards shown by labels and placards,
- carry a valid training certificate,
- handle dangerous goods carefully to prevent spills and leaks,
- take action in case of a spill or leak.



The TDG system provided information to all personnel that are, or may be, in contact with dangerous goods.

The regulations are designed so that everyone who deals with dangerous goods are trained and carry a valid certificate that indicates:

- The person understands the hazards of each class of waste,
- Recognizes the hazards with the labels and placards,
- Understands how to handle dangerous goods,
- Know how to implement the emergency action plan if needed.

The certificate is:

- Valid for three (3) years,
- Signed by your employer,
- Non-transferrable from employer to employer,
- On you at all times when transporting dangerous goods,
- Issued to yourself if you are self-employed with the same expectations as above

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Saskatchewan Hazardous Substance and Waste Dangerous Goods Regulations

Provincial regulations exist Canada wide that define what each Province considers a Hazardous Waste, and what levels of impact are assigned to specific compounds.

For instance, Polychlorinated Biphenyls, PCB, are Federally regulated at 50 parts per million (ppm). Saskatchewan provincially defines PCB waste as hazardous at 5 ppm, a factor of one tenth the Federal regulations.

The HSWDGR is an Act respecting the Management and Protection of the Environment codified under Chapter E-10.21 of The Statutes of Saskatchewan, 2002 (effective October 1, 2002) as amended by the Statutes of Saskatchewan, 2003, c.29; 2004, c.L-16.1; 2005, c.S-35.03; and 2007, c.13.

As with many Provincial regulations, the HSWDG regulation was a pro-active and direct response from Saskatchewan Environment to deal with the improper and poorly managed storage and handling of hazardous chemicals and associated wastes. The sectors targeted were chemical warehouses, waste transfer stations/storage facilities, and the AST and UST's that came from the petrochemical industry.

The early mandated legislation referred to as the Environmental Spill Control Regulation implemented in 1981, and primarily sets limits for the unscheduled release of 118 pollutants to the environment that require the owner to report, remediate, and dispose of if such an occurrence happens.

Reference Website: <http://www.qp.gov.sk.ca/documents/English/Regulations/Regulations/E10-2R3.pdf>



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WHAT TYPES OF THINGS DO WE EXPECT TO SEE?

So, at an HHW, what is the REAL-LIFE stuff we're going to get?

Automotive

- Gas, diesel, glycols, oil filters, & oils
- Windshield fluid, lubricants & greases
- Auto-body resins, auto paints, solder

Agricultural

- Pesticides, herbicides, insecticides, fungicides
- Fertilizers, plant foods, lawn foods

Batteries

- Cell phones, rechargeable, portable 2-way radios
- NiCad, lithium Alkaline, lead acid,
- Watch, hearing-aid, flashlight

Cylinders

- Propane, acetylene torches, carbon dioxide, compressed air
- BBQ tanks

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Household

- Cleaners, disinfectants, pool chemicals, water treatment
- Glues, epoxy, silicon, caulking
- Fluorescent tubes, fire extinguishers
- Off, Raid, Rat Poison, Ant Traps, Spider Killer
- CLR, Mr. Clean, Bleach, Borax, Ajax

Paint

- Paints, thinners, spray paints
- Stains, shellac, varnish
- Varsol, latex paint, oil-based paint(s), aerosol cans

Specialty

- PCB Ballasts,
- Mercury,

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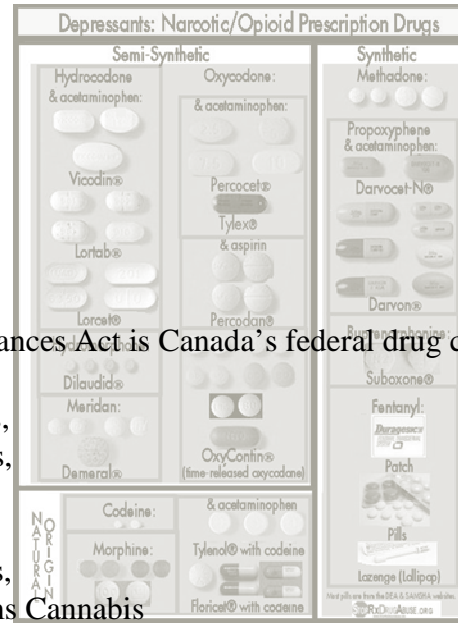
Pharmaceuticals

- Medicines – Warfarin, Insulin

Prohibited Materials

• *Controlled Substance compounds*

- Schedule I, Controlled Drugs and Substances Act is Canada's federal drug control statute. Passed in 1996)
- Schedule II Cannabis Derivatives,
- Schedule III Amphetamines/Barbituates,
- Schedule IV steroids and phenobarbitals,
- Schedule V Propylhexedrine,
- Schedule VI Precursors,
- Schedule VII - 3kg Hashish or Cannabis,
- Schedule VIII - 1g Hashish and 30 grams Cannabis

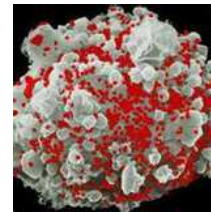


- *Certain Prescription pharmaceuticals* - Morphine, Codeine, Demerol, Valium, OxyContin, Prozac, Ritalin, Cocaine packs, legalized marihuana, Opium

- *Smoke Detectors* – Americium radioactive source

• *Bio-hazardous Materials*

- Body fluids (human or animal) – urine, feces, blood, serum
- Sharps – needles, scalpels, surgical items
- Animal remains
- Laboratory cultures
- Septic waste



- Electronics
- Tires
- Explosives, gun powders, ammunition, blasting caps

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WHERE DOES ALL THIS STUFF GO AFTERWARD?

First –

Lab packing is a term used to describe the consolidation of smaller containers, 5 L or less in a secondary drum for transportation. The secondary drum is a U.N approved 205 litre drum with poly liner for containment, and about 2 inches of Absorbant material (floor dry, vermiculite) placed on the floor of the empty drum.

The maximum volume for packing into labpacks is 60 litres. At this volume when covered with vermiculite, a 3:1 ratio of absorbant to chemical is maintained in the event of breakage inside the drum.

Field lab packing is more involved than simply packing by the 9 Classes identified earlier by TDG, and involves the specific chemistry of a compound when considering other compatibilities. This is where the differences come in from TDG to the Field chemist system, and is based on Hazardous Materials, Substances, & Waste Compliance Guide from US EPA

STEP 1:

The very basic needs of a field chemist fall into the following generic headings under the “IRCT” model:



1. Ignitability - Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F). TDG regulates “flammability” as anything under 60.0°C

2. Reactivity - the rate at which a chemical substance tends to undergo a chemical reaction.

3. Corrosivity - Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels

4. Toxicity - the degree to which a substance is able to damage an exposed organism, short term (acute) and long term (chronic), and is measured by Threshold Values, LD50, and LC50.

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STEP 2:

Field chemists use this model in conjunction with other questions to determine how to pack items. The basic questions that need to be asked and answered each time are:

- Is the material **Solid or Liquid?**
- What is the materials **pH?**
- Is the material an **Oxidizer?**
- Is the material **Organic or Inorganic?**
- Is the material **Flammable or Non-Flammable?**
- Is the compound **Halogenated?**

STEP 3:

The final step the Field Chemists use is to break compounds down into the final categories of separation by use of an Alphabet System:

Class A: Inorganic Acids

Sulphuric Acid, Hydrochloric Acid

Class B: Inorganic Bases

Sodium Hydroxide, Potassium Hydroxide

Class C: Organic Solids

Sodium Bicarbonate, Citric Acid

Class D: Organic Liquids

Carboxylic Acid, Phenolphthalein, Ink



STEP 3:

The final step the Field Chemists use is to break compounds down into the final categories of separation by use of an Alphabet System:

Class E: Oxidizing Compounds

Bleach, Nitric Acid, Hydrogen Peroxide

Class F: Pesticides and Herbicides

2,4-D, Warfarin, Roundup, Weedex, Ant Traps

Class H: Air/Water Reactive Materials

Sodium Metal, Magnesium, Lithium, Phosphorous

Class I: Cyanides

Cyanic Acid

Class J: Isothiocyanates and Isocyanates

Class P: Paint Liquids and Paint Related Materials

Unknown chemicals are frequently encountered in the daily operations of Field Chemists and need to be categorized to safely handle and process all the same.

RULE #1 AT ALL TIMES IS THAT "IF YOU DON'T KNOW WHAT IT IS, TREAT IT LIKE IT WILL KILL YOU.....BECAUSE IT PROBABLY WILL"

Unknown chemicals come in many shapes and sizes, and include:

- Containers with no label.
- Containers with more than 1 label.
- Containers with partial labels.
- Containers with incorrect labels.
- Containers with mixtures.
- Household containers (milk jugs, pails) with chemicals in them.
- Things the "Owner" has no idea about
- Items that look suspicious to Field Chemists based on visual inspection
- Extremely old compounds, particularly volatile items – Oxidizers, ethers, medicines.

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- Each item that is collected at an HHW has a home – one that is specified for the proper disposal of that item.
- In general, the waste goes for one of the following processes after it is packaged:
 - Recycling – Oils, latex paint, some solvents and flammable liquids, antifreeze
 - Incineration – fuels, chemicals, halogenated items, PCB, oil-based paints
 - Neutralization – acids, caustics
 - Water treatment – waste water, petroleum hydrocarbon impacted water
 - Soil Treatment Centre – Soil with hydrocarbons
 - Secure Industrial Landfill - absorbents

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IS IT EXPENSIVE?

- There is no real way to answer this question fairly
- The REAL answer – it can be if you don't know what you're getting into. But alternatively, it can be extremely worse if you have to clean up the landfill
- To evaluate the cost of this type of event, weigh the following points:
 - What is the Unit rate (per drum) pricing of each waste type, and what is all included in this price?
 - Labels, packing material, disposal, supply of the UN rated drum?
 - What is the hourly rate for HazMat Technicians to package the waste? How long will it take?
 - What is the communities liability with the work? Does Envirotec provide insurance in case something goes wrong? Is it the right insurance?
 - What is our liability if we have volunteers? Do we prefer to have hired sub-contractors instead?
 - How reputable is the Contractor? How about the disposal facility? How do we know this?
 - What Value-Added benefits come with Envirotec for something like this? Are we safe? Do we have a good reputation with WCB?

- Envirotec's role is to make this viable for our communities so that it can be successfully held each year. We do this by:
 - Being economical, fair, and open with what we do at all times
 - Providing up-front and honest information to our clients, service providers, and employees
 - Ensuring world-class service in our own back yard for all of our services
 - Maintaining an international presence with industry committees and agencies
 - Hosting industry conferences each year to help inform the public

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QUESTIONS AND COMMENTS



SAFETY

Who needs that?

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