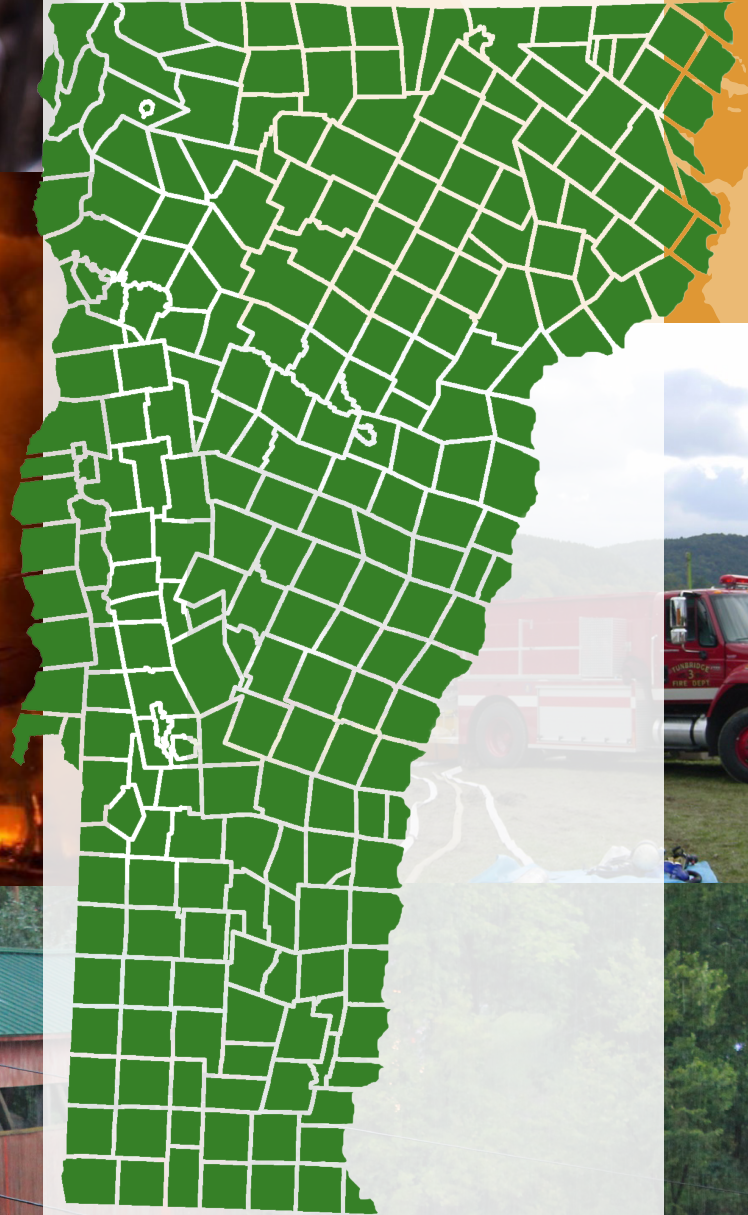


Vermont State Commodity Flow Study

2017



TRORC
Two Rivers-Ottauquechee
REGIONAL COMMISSION

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Acknowledgments

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Review during this project was provided by Bruce Martin, Deputy Chief of the Vermont HAZMAT Team.

Authors: Victoria Littlefield; Chris Damiani; Kevin Geiger, AICP

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The Two Rivers-Ottauquechee Regional Commission (TRORC) received funding from the State Emergency Response Commission (SERC) under the Hazardous Materials Emergency Preparedness (HMEP) Grant to conduct a state-wide commodity flow study of hazardous materials and extremely hazardous substances transported over selected Interstate, State and U.S. Highways in Vermont. Commodity flow studies assist in response planning through providing a data-driven view as to the types and amounts of materials traveling over the highways. TRORC partnered with the following Regional Planning Commissions to conduct this study:

- Addison County Regional Planning Commission (ACRPC)
- Northwest Regional Planning Commission (NRPC)
- Windham Regional Commission (WRC)
- Bennington County Regional Commission (BCRC)

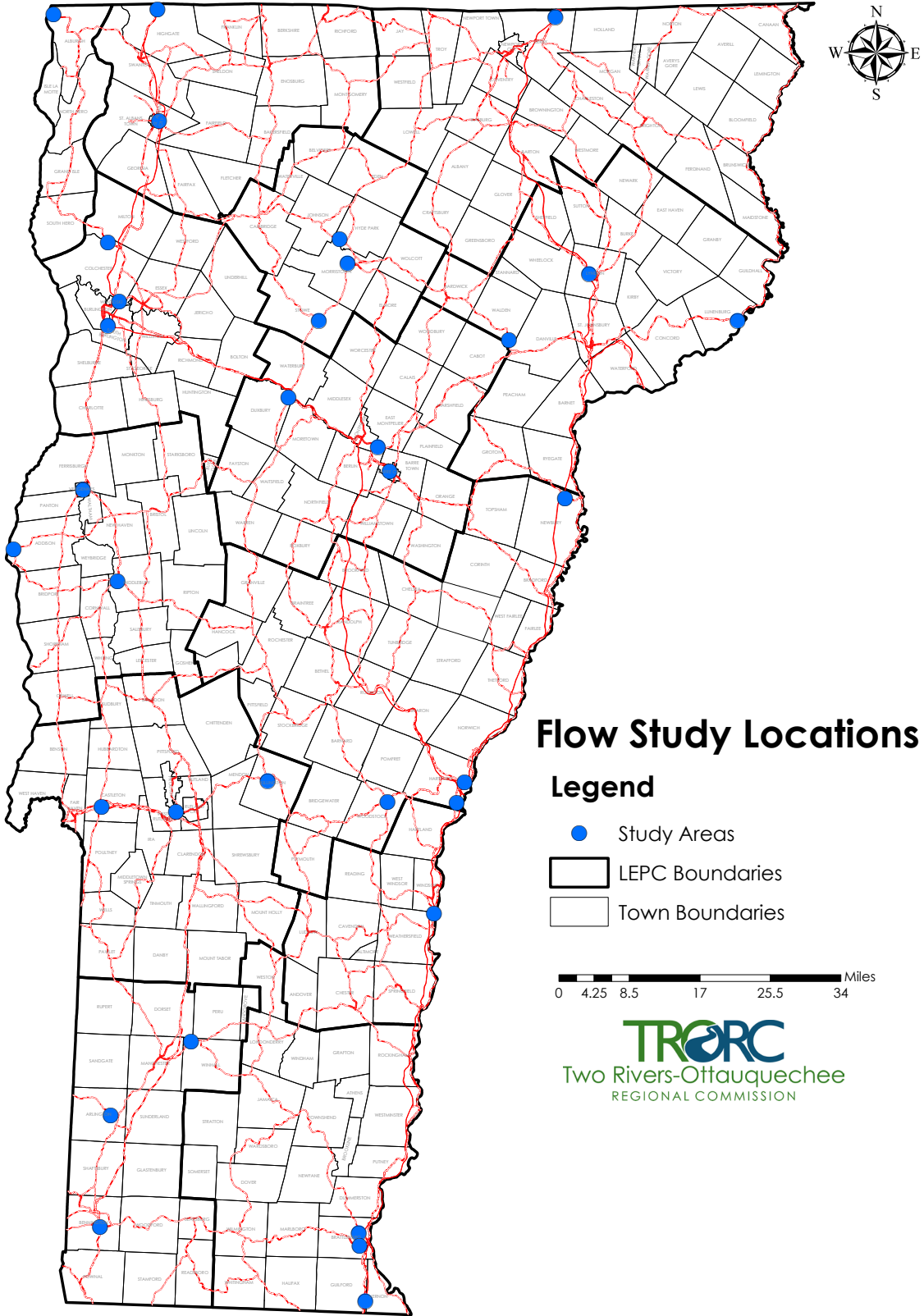
To gather interstate traffic data, TRORC worked with the Vermont Department of Motor Vehicles (DMV) at several truck stop points on Interstate 91. In addition, NRPC worked with the Department of Homeland Security to obtain Canada/U.S. border crossing data at the Highgate Springs (I-89) and Derby (I-91) Point of Entries for 2016.

Table 1 and Map 1 below shows the locations where data was captured across Vermont.

Location	Route
Addison	VT Route 17
Alburgh	US Route 2
Arlington	VT Route 7A
Barre	US Route 302
Bennington	VT Route 9
Brattleboro (US 5)	US Route 5
Brattleboro (VT 9)	VT Route 9
Castleton	VT Route 30
Colchester	US Route 2
Danville	US Route 2
Derby Border Crossing	I-91
Essex	VT Route 15
Guildhall	US Route 2
Guilford Weigh Station	I-91
Harford	US Route 5
Highgate Border Crossing	I-89
Hyde Park	VT Route 100
I-91 (Lyndon)	I-91
I-91 (WRJ)	I-91
Killington	VT Route 100
Manchester	VT Route 30
Middlebury	VT Route 7
Montpelier	US Route 2
Morrisville	VT Route 12
Newbury	US Route 302
Rutland	VT Route 7
Saint Albans	VT Route 7
South Burlington	VT Route 7
Stowe	VT Route 100
Vergennes	VT Route 7
Waterbury	VT Route 100
Weathersfield	VT Route 12
Woodstock	US Route 4

Table 1: HMEP Flow Study Locations

Introduction



Map 1: HMEP Flow Study Locations

Data Collection

Each site area was selected based on State/U.S. routes coming into Vermont or intersecting each other. In this manner, a thorough view of most hazardous materials was captured (as Vermont originates few such trips beyond fuel delivery). Rather, the state handles traffic going through East-West or North-South, as well as loads with ultimate destinations in Vermont. Since data is captured by observing placarded loads, traffic must be relatively slow and there must be a safe location to observe trucks in all weather.

For example, the Newbury location was selected because it captured traffic coming into Vermont via U.S. Route 302 and going North/South via U.S. Route 5 after stopping at the intersection. DMV truck stops were used on the interstates as traffic is fast and there is no safe observation point. Border data was used for U.S. ports of entry from Canada as observing border crossings create security and safety concerns; as much of this traffic crosses at night.

Every site (except border crossings) was surveyed a total of three times from the fall of 2016 to the early summer of 2017 for four hour increments. Surveys did not take place during the winter months. The four hour periods were completed during weekdays when hazardous

materials were most likely to be transported. Every survey was completed at a different time period of the day to try and capture the most diverse data possible.

The following data was collected during each survey and entered into a universal form:

- Time truck went by survey location,
- Placard numbers on the truck,
- Truck type,
- Direction vehicle was traveling, and;
- Any comments the surveyor deemed necessary.



Source: DOT Chart 16 Hazardous Materials Markings, Labeling and Placarding Guide

Introduction

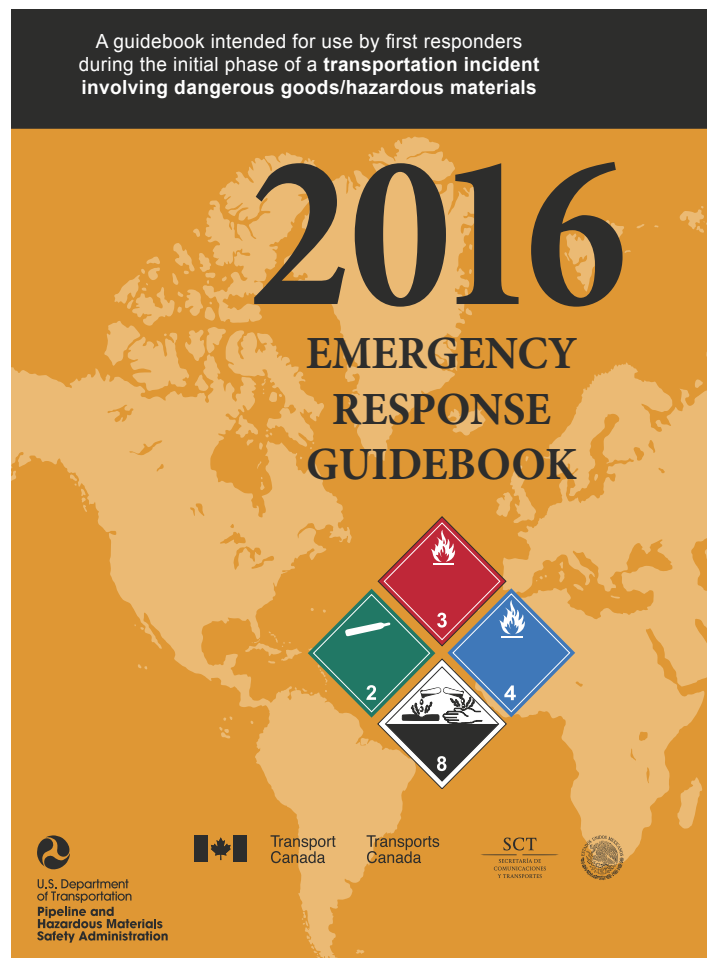
Data Organization

For the purposes of this report, the data is organized by each of the thirteen Local Emergency Planning Committees (LEPC), with a separate data analysis of the border crossing data at Highgate and Derby. Three random days and time periods were selected from the Highgate and Derby locations and included with the rest of the survey locations. Each LEPC's section will show the raw data taken at each survey location, a map of the LEPC with attributing locations, and charts that show the percentage of each placard that went through each survey location and LEPC. This is to show first responders the hazardous materials they are most likely to respond to in the event of an emergency.

The data is also shown to include peak times when hazardous materials are being transported on Vermont roads, as well as the occurrences of the placards recorded. In regards to the border crossing data, a more in depth analysis was completed to show all of the 2016 data of materials coming into the U.S. from Canada at the two major points of entry.

Response guidelines are also provided throughout this report. These guidelines were obtained from the 2016 Emergency Response Guidebook (ERG) published by the U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration (PHMSA). This publication is free and can be provided either as a downloaded PDF file or as a physical copy. Physical copies can be requested through your LEPC or VEM.



Truck Volume

A grand total of 1,779 trucks (not including border crossing data) were recorded for this survey across the 33 different survey locations. The highest volume location was South Burlington on U.S. Route 7. The location that experienced the least amount of hazardous trucks was Morrisville on VT Route 12. Guildhall was only surveyed one time, as there was only one hazardous truck in the four hour survey period. The I-91 weigh stations in Lyndon and White River Junction were only surveyed once in order to capture different locations on the interstate. Guilford was surveyed three different times. Figure 1 shows the total truck volume across all survey locations. (Figure 2 does not include the border crossing data).

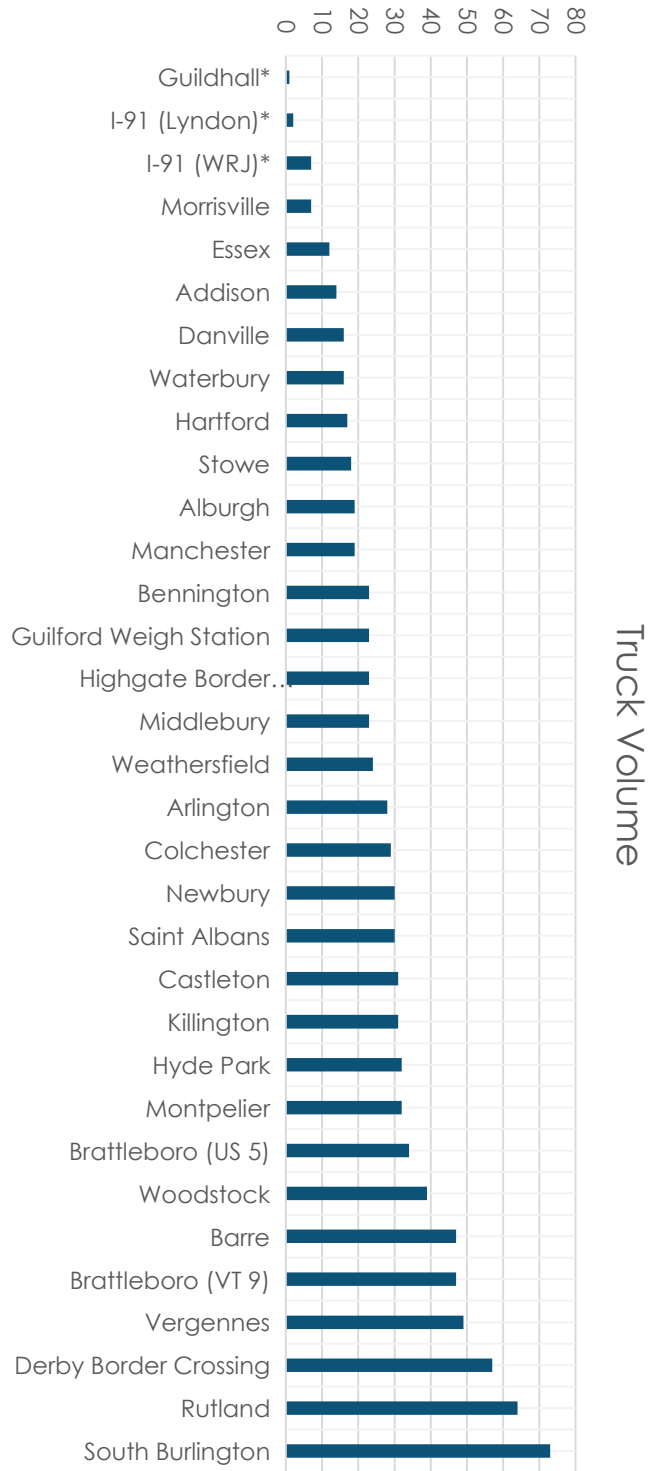


Figure 1: Truck volume by location

State Wide Data

Peak Times

All truck surveys (not including border crossing data) were inventoried between 7 a.m. and 6 p.m. on weekdays when hazardous materials are most likely to be transported and placards visible. Time was broken up into increments of one hour time periods. For example, the 8 a.m. time frame includes all trucks that traveled from 8:00 to 8:59 a.m. As you can see in Figure 2 below, truck transportation peaked at 1:00 p.m. After that time frame, truck frequencies drop dramatically in occurrence. Consistently, as seen in Figure 3, much of the truck activity occurred from 9 to 11 a.m.

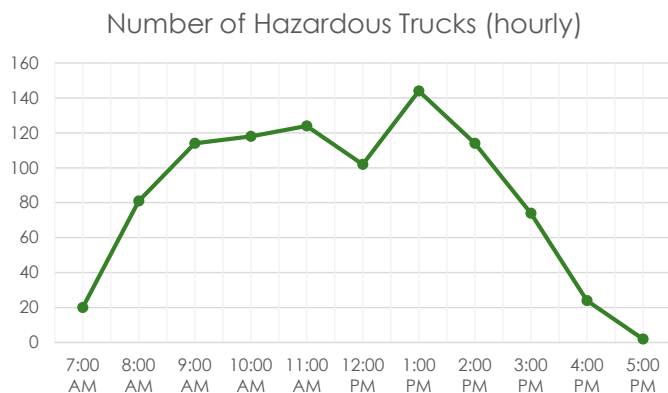


Figure 2: Number of Hazardous Trucks by hour

Placards

Staff recorded 102 different placards across Vermont (includes border crossing data). Table 2 on the next few pages lists the placard number, the type of material associated with that

placard, as well as the corresponding guide number in the ERG. The ERG pages are located at the back of this report with a list of corresponding placards.

In total, 1,802 placards were recorded (not including border crossing data). You may have noticed that only 1,779 trucks were recorded, but there were 1,802 placards recorded. That is because several of the trucks surveyed during this study had two placards, and one was recorded as having four different chemicals in the vehicle! As you can see in Figure 4, most of the hazardous materials recorded were gas and propane. From the comparison of the rest of the chemicals recorded, there is a large disparity between gas and propane and the rest of the placards. **In the event of a HAZMAT situation, responders are more likely to deal with gas and propane than any other chemical in Vermont.**

Figure 3 (page 16) shows the placard occurrences for the state wide survey, this does not include the placards recorded at the border crossings.

State Wide Data

Placard	Material	Guide Number
81	Dynamite	
255	Detonators, electric, for blasting	
331	Explosives, blasting, type a	
360	Detonator assemblies, non electric for blasting	
456	Detonators, electric, for blasting	
1005	Ammonia	125
1073	Oxygen, liquid	122
1075	Butane	115
1090	Acetone	127
1123	Butyl acetates	129
1126	Butyl bromide	130
1133	Adhesives	128
1170	Ethyl alcohol	127
1175	Ethylbenzene	130
1182	Ethyl chloroformate	155
1193	Ethyl methyl krtone	127
1197	Extracts, flavoring, liquids	127
1202	Diesel (heating oil)	128
1203	Gasoline	128
1219	Isopropanol	129
1223	Kerosene	128
1233	Methylamyl acetate	130
1263	Paint	128
1266	Perfumery products	127
1268	Petroleum	128
1289	Sodium methylate, solution in alcohol	132
1294	Toluene	130
1322	Dinitroresorcinol, wetted with no less than 15% water	113
1325	Fusee (rail or highway)	133
1486	Potassium nitrate	140
1627	Mercurous nitrate	141
1710	Trichloroethylene	160
1719	Caustic alkalie liquid	154
1759	Ferrous chloride, solid	154
1760	Chemical kit	154

State Wide Data

1760	Chemical kit	154
1789	Hydrochloric acid	157
1791	Hypochlorite solution	154
1805	Phosphoric acid	154
1819	Sodium aluminate	154
1821	Sodium bisulfate	
1824	Sodium hydroxide, solution	154
1830	Sulfuric acid	137
1836	Thionyl chloride	137
1863	Fuel, aviation	128
1866	Resin solution	127
1908	Chlorite solution	154
1942	Ammonium nitrate, with not more than 0.2% combustible substances	140
1950	Aerosols	126
1966	Liquid hydrogen	115
1970	Krypton, refrigerated liquid	120
1971	Methane	115
1972	Liquefied natural gas	115
1977	Nitrogen	120
1992	Flammable liquid	131
1993	Diesel fuel	128
1999	Asphalt	130
2014	Hydrogen peroxide, aqueous solution	140
2053	Methylamyl alcohol	129
2187	Carbon dioxide (liquified)	120
2209	Formalin	132
2289	Isophorenediamine	153
2301	2-Methylfuran	128
2528	Isobutyl isobutyrate	130
2582	Ferrous chloride, solution	154
2672	Ammonia, solution, with more than 10% but no more than 35%	154
2693	Bisulfites	154
2734	Polyamines	132
2735	Amines	153
2789	Acetic acid	132
2794	Batteries, wet, filled with acid	154

State Wide Data

2916	Radioactive material type b	163
2922	Corrosive liquid, poisonous	154
2924	Flammable liquid	132
3065	Alcoholic beverages	127
3077	Hazardous waste	171
3082	Environmentally hazardous substance, liquid	171
3101	Organic peroxide type b, liquid	146
3108	Organic peroxide, type e, solid	145
3149	Peroxyacetic acide	140
3181	Metal salts of organic compounds, flammable	133
3257	Elevated temperature liquid	128
3259	Amines, solid, corrosive	154
3264	Corrosive liquid, acidic, inorganic	154
3265	Corrosive liquid	153
3266	Corrosive liquid,basic, inorganic	154
3267	Corrosive liquid, basic, organic	153
3375	Ammonium nitrate	140
3481	Lithium ion batteries packed with equipment	147
8635	Unknown	
Combustible		136
Corrosive		153
Dangerous		111
Dangerous When Wet		139
Electrocution Conduction Hazard		139
Explosives		112
Flammable		127
Flammable Gas		118
Hazardous		
Non-Flammable		121
Oxidizer		143
Oxygen		122
Poison		153

Table 2: List of Placards found at study locations

State Wide Data

Total Placard Occurences by Frequency (not including border crossings)

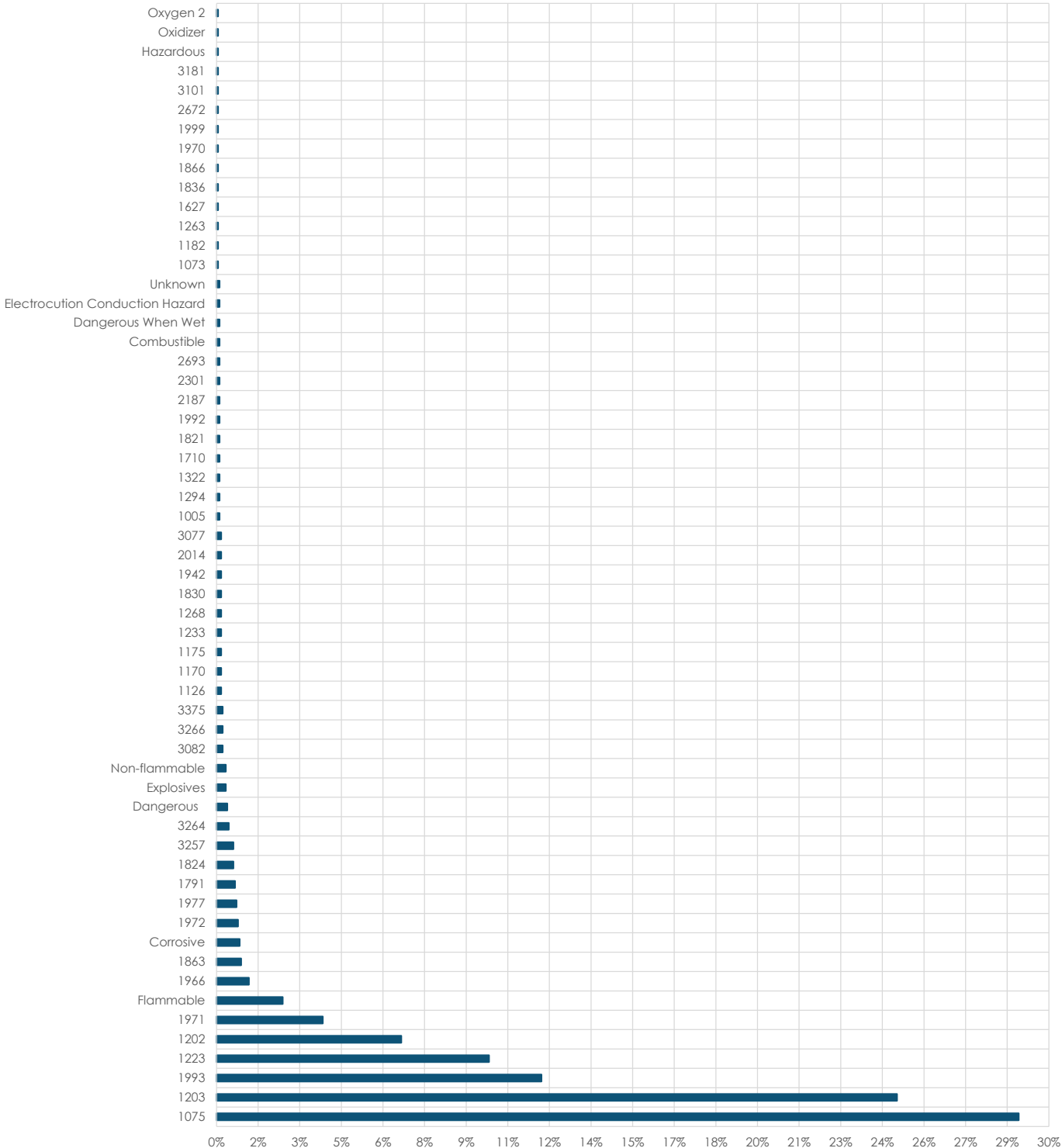


Figure 3: Total Placard Occurences by Frequency

Petroleum vs. Non-Petroleum

The percentage of petroleum products in this survey is 88% (or 1,569) of all placards recorded, with just 12% (or 210) of non-petroleum products. Petroleum involves the following recorded placards:

- 1075 (Nine kinds of liquefied gases, including propane)
- 1203 (gasoline)
- 1223 (kerosene)
- 1268 (petroleum products)
- 1863 (aviation fuel)
- 1971 (methane, natural gas)
- 1972 (refrigerated methane)
- 1993 (diesel, fuel oil)
- 1202 (diesel, fuel oil, heating oil)

Petroleum vs. Non-Petroleum

■ Petroleum ■ Non-Petroleum

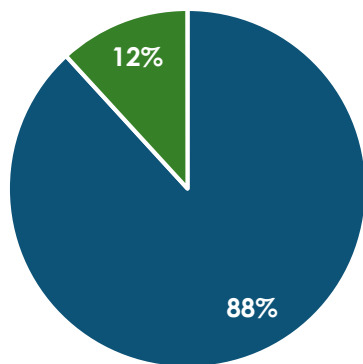


Figure 4: Petroleum vs. Non Petroleum Breakdown

Since petroleum products make up the majority of hazardous materials being transported on Vermont roads, we broke up the recorded petroleum placards into two groups, liquid fuels and compressed/liquefied gas products. Based on these numbers, it was a 38/62 split between the two. First responders are most likely to deal with a liquid fuel spill as they are a compressed gas spill.

Gasoline	Propane
1203	1075
1268	1971
1863	1972
1993	
1202	
1223	

Table 3: Fuel and Gas Placards

Liquified Fuel vs. Compressed/Liquified Gas

■ Liquified Fuel ■ Compressed/Liquified Gas

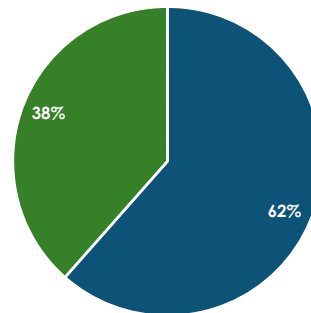


Figure 5: Liquified Fuel vs. Compressed/Liquified Gas Breakdown

Non-Petroleum Products

Although only 12% of all recorded placards are non-petroleum, there is still some cause for concern for certain hazardous materials. This list includes explosives, oxidizers, poison,

State Wide Data

electrocution hazards, corrosives, combustibles, and other materials that are either flammable or non-flammable. Below are definitions of some of these groups of chemicals :

- Combustible liquid: Liquids which have a flash point greater than 60°C (140°F) and below 93°C (200°F).
- Flammable liquid: A liquid that has a flash point of 60°C (140°F) or lower.
- Oxidizer: A chemical which supplies its own oxygen and which helps other combustible material burn more readily.

In the ERG, placards are broken up into nine different classes. Placards

are required by law to list the class number at the bottom of the placard, under the placard number. This helps first responders and HAZMAT teams identify how to deal with that substance during an event.

Every placard that is regulated by the U.S. Department of Transportation (US DOT) has a corresponding guide number that explains the severity of that hazardous material and how you should respond to it. You can look up this information by searching for the placard number in the yellow section of the ERG, or in the blue section by the name of the chemical. You may notice that some of the chemicals in the yellow section are highlighted in green, this means that there are special response processes if that particular chemical were to spill as they have toxic inhalation hazards.

Example

Placard #1005 was recorded in Brattleboro on VT Route 9 off the I-91 exit. This chemical is anhydrous ammonia, whose guide number is 125. This particular chemical also has a green highlight. If this chemical was spilled, responders should proceed to guide number 125 which states anhydrous ammonia is a corrosive gas that may be fatal if inhaled, ingested, or absorbed through the skin. Within this guide, there are different response processes listed if this product spilled or caught on fire. If on fire, it is recommended that the site be

HAZARD CLASSIFICATION SYSTEM

The hazard class of dangerous goods is indicated either by its class (or division) number or name. Placards are used to identify the class or division of a material. The hazard class or division number must be displayed in the lower corner of a placard and is required for both primary and subsidiary hazard classes and divisions, if applicable. For other than Class 7 placards, text indicating a hazard (for example, "CORROSIVE") is not required. Text is shown only in the U.S. The hazard class or division number and subsidiary hazard classes or division numbers placed in parentheses (when applicable), must appear on the shipping document after each proper shipping name.

Class 1 - Explosives	
Division 1.1	Explosives which have a mass explosion hazard
Division 1.2	Explosives which have a projection hazard but not a mass explosion hazard
Division 1.3	Explosives which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard
Division 1.4	Explosives which present no significant blast hazard
Division 1.5	Very insensitive explosives with a mass explosion hazard
Division 1.6	Extremely insensitive articles which do not have a mass explosion hazard
Class 2 - Gases	
Division 2.1	Flammable gases
Division 2.2	Non-flammable, non-toxic* gases
Division 2.3	Toxic* gases
Class 3 - Flammable liquids (and Combustible liquids [U.S.])	
Class 4 - Flammable solids; Substances liable to spontaneous combustion; Substances which, on contact with water, emit flammable gases	
Division 4.1	Flammable solids, self-reactive substances and solid desensitized explosives
Division 4.2	Substances liable to spontaneous combustion
Division 4.3	Substances which in contact with water emit flammable gases
Class 5 - Oxidizing substances and Organic peroxides	
Division 5.1	Oxidizing substances
Division 5.2	Organic peroxides
Class 6 - Toxic* substances and Infectious substances	
Division 6.1	Toxic* substances
Division 6.2	Infectious substances
Class 7 - Radioactive materials	
Class 8 - Corrosive substances	
Class 9 - Miscellaneous dangerous goods/hazardous materials and articles	

* The words "poison" or "poisonous" are synonymous with the word "toxic".

Page 6

State Wide Data

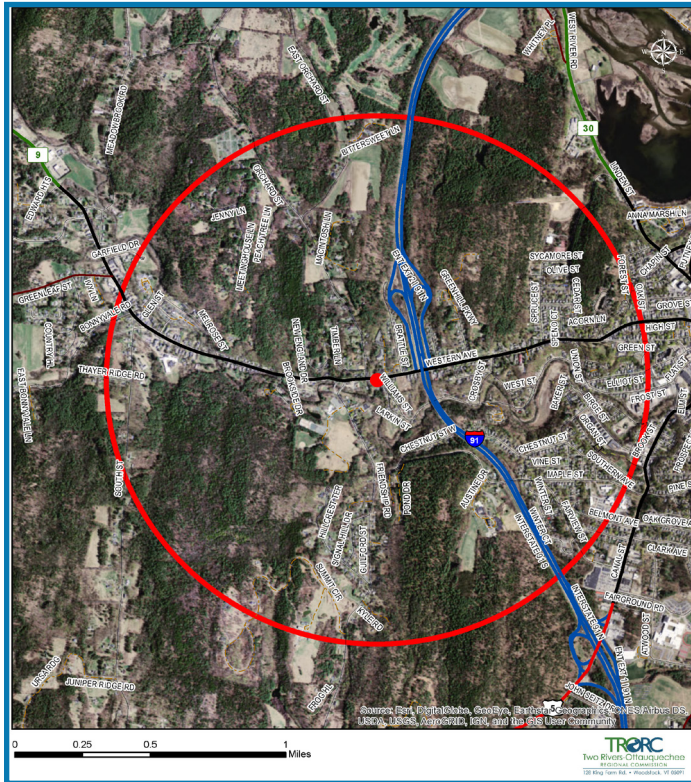


Figure 6: Map of Recommended evacuation radius

isolated and evacuations take place within a one mile radius of the spill. In this location from an ammonia spill a large area affected from this HAZMAT situation.

According to Guide Number 125, if the anhydrous ammonia were to spill from the container it was being transported in, the responder should reference Table 1 – Initial Isolation and Protective Action Distances in the back of the ERG (green section). It is recommended that an initial 100 foot isolation area should be installed, and that those 0.1 miles downwind of the spill should be protected for small spills. For large spills, we are directed to Table 3 in the ERG, which

GUIDE 125 GASES - CORROSIVE	GASES - CORROSIVE GUIDE 125
POTENTIAL HAZARDS	EMERGENCY RESPONSE
<p>HEALTH</p> <ul style="list-style-type: none"> • TOXIC; may be fatal if inhaled, ingested or absorbed through skin. • Vapors are extremely irritating and corrosive. • Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. • Fire will produce irritating, corrosive and/or toxic gases. • Runoff from fire control may cause pollution. <p>FIRE OR EXPLOSION</p> <ul style="list-style-type: none"> • Some may burn but none ignite readily. • Vapors from liquefied gas are initially heavier than air and spread along ground. • Some of these materials may react violently with water. • Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices. • Containers may explode when heated. • Ruptured cylinders may rocket. • For UN1005: Anhydrous ammonia, at high concentrations in confined spaces, presents a flammability risk if a source of ignition is introduced. <p>PUBLIC SAFETY</p> <ul style="list-style-type: none"> • CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. • As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. • Keep unauthorized personnel away. • Stay upwind, uphill and/or upstream. • Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). • Ventilate closed spaces before entering. <p>PROTECTIVE CLOTHING</p> <ul style="list-style-type: none"> • Wear positive pressure self-contained breathing apparatus (SCBA). • Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. • Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible. <p>EVACUATION</p> <p>Spill</p> <ul style="list-style-type: none"> • See Table 1 - Initial Isolation and Protective Action Distances for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY". <p>Fire</p> <ul style="list-style-type: none"> • If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. 	<p>FIRE</p> <p>Small Fire</p> <ul style="list-style-type: none"> • Dry chemical or CO₂. <p>Large Fire</p> <ul style="list-style-type: none"> • Water spray, fog or regular foam. • Move containers from fire area if you can do it without risk. • Do not get water inside containers. • Damaged cylinders should be handled only by specialists. <p>Fire Involving Tanks</p> <ul style="list-style-type: none"> • Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. • Cool containers with flooding quantities of water until well after fire is out. • Do not direct water at source of leak or safety devices; icing may occur. • Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. • ALWAYS stay away from tanks engulfed in fire. <p>SPILL OR LEAK</p> <ul style="list-style-type: none"> • Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. • Do not touch or walk through spilled material. • Stop leak if you can do it without risk. • If possible, turn leaking containers so that gas escapes rather than liquid. • Prevent entry into waterways, sewers, basements or confined areas. • Do not direct water at spill or source of leak. • Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. • Isolate area until gas has dispersed. <p>FIRST AID</p> <ul style="list-style-type: none"> • Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. • Move victim to fresh air. • Call 911 or emergency medical service. • Give artificial respiration if victim is not breathing. • Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. • Administer oxygen if breathing is difficult. • Remove and isolate contaminated clothing and shoes. • In case of contact with liquefied gas, thaw frosted parts with lukewarm water. • In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes. • In case of contact with Hydrogen fluoride, anhydrous (UN1052), flush with large amounts of water. For skin contact, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available. For eyes, flush with water or a saline solution for 15 minutes. • Keep victim calm and warm. • Keep victim under observation. • Effects of contact or inhalation may be delayed.
<p>Page 188</p> <p>ERG 2016</p>	<p>Page 189</p> <p>ERG 2016</p>

Figure 7: Guide 125 of the ERG

State Wide Data

states several situational responses depending on how the product was being transported, the current wind speed, and time of day. This

could result in protective actions well beyond a mile.

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during			
				DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		
1005	125	Ammonia, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1005	125	Anhydrous ammonia								
1008	125	Boron trifluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.4 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)		
1008	125	Boron trifluoride, compressed								
1016	119	Carbon monoxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.4 km (2.8 mi)		
1016	119	Carbon monoxide, compressed								
1017	124	Chlorine	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	Refer to table 3				
1026	119	Cyanogen	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)		
1040	119P	Ethylene oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1040	119P	Ethylene oxide with Nitrogen								
1045	124	Fluorine	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.5 km (0.3 mi)	2.2 km (1.4 mi)		
1045	124	Fluorine, compressed								
1048	125	Hydrogen bromide, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)		
1050	125	Hydrogen chloride, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	Refer to table 3				
1051	117	AC (when used as a weapon)	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	3.7 km (2.3 mi)	8.4 km (5.3 mi)		
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide								
1051	117	Hydrogen cyanide, anhydrous, stabilized	60 m (200 ft)	0.2 km (0.2 mi)	0.9 km (0.6 mi)	300 m (1000 ft)	1.1 km (0.7 mi)	2.4 km (1.5 mi)		
1051	117	Hydrogen cyanide, stabilized								

Table 4: Isolation and Protective Action Distances

Page 355

TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

TRANSPORT CONTAINER	First ISOLATE in all Directions Meters (Feet)		Then PROTECT persons Downwind during							
			DAY			NIGHT				
			Low wind (< 6 mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind (> 12 mph = > 20 km/h)	Low wind (< 6 mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind (> 12 mph = > 20 km/h)		
			km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	
	UN1005 Ammonia, anhydrous: Large Spills									
Rail tank car	300 (1000)		1.7 (1.1)	1.3 (0.8)	1.0 (0.6)	4.3 (2.7)	2.3 (1.4)	1.3 (0.8)		
Highway tank truck or trailer	150 (500)		0.9 (0.6)	0.5 (0.3)	0.4 (0.3)	2.0 (1.3)	0.8 (0.5)	0.6 (0.4)		
Agricultural nurse tank	60 (200)		0.5 (0.3)	0.3 (0.2)	0.3 (0.2)	1.3 (0.8)	0.3 (0.2)	0.3 (0.2)		
Multiple small cylinders	30 (100)		0.3 (0.2)	0.2 (0.1)	0.1 (0.1)	0.7 (0.5)	0.3 (0.2)	0.2 (0.1)		
	UN1017 Chlorine: Large Spills									
Rail tank car	1000 (3000)		9.9 (6.2)	6.4 (4.0)	5.1 (3.2)	11+ (7+)	9.0 (5.6)	6.7 (4.2)		
Highway tank truck or trailer	600 (2000)		5.8 (3.6)	3.4 (2.1)	2.9 (1.8)	6.7 (4.3)	5.0 (3.1)	4.1 (2.5)		
Multiple ton cylinders	300 (1000)		2.1 (1.3)	1.3 (0.8)	1.0 (0.6)	4.0 (2.5)	2.4 (1.5)	1.3 (0.8)		
Multiple small cylinders or single ton cylinder	150 (500)		1.5 (0.9)	0.8 (0.5)	0.5 (0.3)	2.9 (1.8)	1.3 (0.8)	0.6 (0.4)		

"+" means distance can be larger in certain atmospheric conditions

Table 5: Isolation and Protective Action Distances For Large Spills

Placards Not Regulated by U.S. DOT

During this survey, there were some placards that we came across that were not listed in the ERG, hence they are not regulated by the U.S. DOT. This means that if responders are coming upon a chemical spill or fire, it could potentially stall efforts to contain the spill or fire. The following placards were recorded, but are not located in the ERG:

Placard	Chemical
81	Dynamite
255	Detonators, electric, for blasting
331	Explosives, blasting, type a
360	Detonator assemblies, non electric for blasting
456	Detonators, electric, for blasting
1821	Sodium bisulfate
8635	Unknown

Table 6: Isolation and Protective Action Distances

General Placards

General Placards are those that do not state a placard number, and it is not associated with any one chemical name. These are still regulated placards, but as to what the contents are is something you will have to obtain from the company or the driver transporting the chemicals. The placards in Table 6 were recorded during the survey.

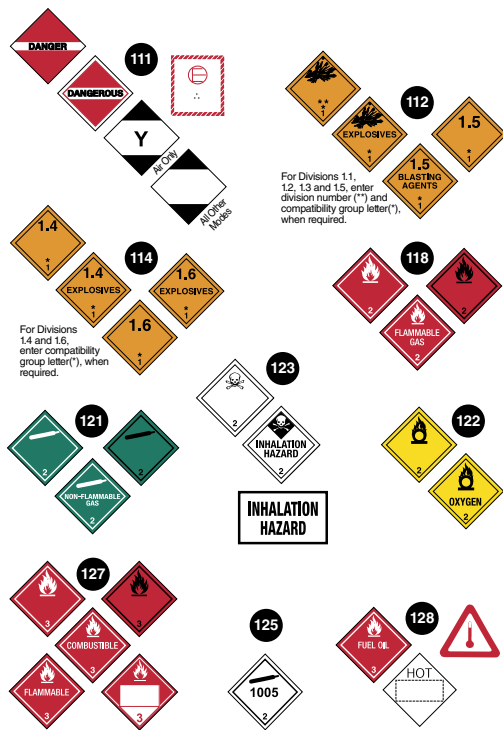
Placard	Guide Number
Combustible	136
Corrosive	153
Dangerous	111
Dangerous When Wet	139
Electrocution Conduction Hazard	139
Explosives	112
Flammable	127
Flammable Gas	118
Hazardous	
Non-Flammable	121
Oxidizer	143
Oxygen	122
Poison	153

Table 7: General Placards

State Wide Data

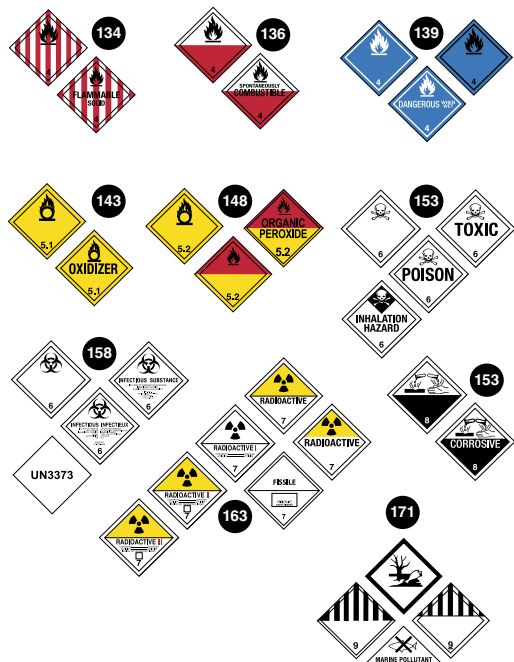
Page 8 and 9 of the ERG display pictures of all the different general placards that one might see out on the road and the corresponding guide number you should follow in the event of fire or a spill.

TABLE OF MARKINGS, LABELS, AND PLACARDS
USE THIS TABLE ONLY IF MATERIALS CANNOT BE SPECIFICALLY IDENTIFIED BY



Page 8

AND INITIAL RESPONSE GUIDE TO USE ON-SCENE
USING THE SHIPPING DOCUMENT, NUMBERED PLACARD, OR ORANGE PANEL NUMBER



Page 9

Non-Placarded Loads

Most trucks observed had no placards, but responders should remain alert that many trucks may carry significant amounts of hazardous materials, but just aren't placarded as such. This is due to the fact that placards are only required when materials are over certain exempt quantities and in larger bulk containers or a single tanker. When packaged as a consumer product, hazardous materials can be classed as "ORM-D", which stands for Other Regulated Materials-Consumer Commodity. To qualify as an ORM-D, a substance must first meet the limited quantity exception.

Responders to non-placarded spills should ask drivers if there is any ORM-D on loads. Common sense would indicate that trucks for hardware store chains or paint companies may be carrying loads that could cause concern. However, UPS, FEDEX, couriers, and trucks for office supplies, general consumer goods, and even rental trucks may create hazards if spilled or ignited during a crash. Finally, responders must remember that trucks themselves can carry large amounts of diesel fuel. Some trucks/buses are also propane powered.

The most detailed description of what is in the load will be in the manifest. Many trucks no longer carry paper records, but instead have their records digitally recorded and kept on laptops or similar devices. Responders should

look for laptops or other devices in the event of accidents where the driver is not conscious. It is also possible that laptops would be damaged in crashes and the manifest therefore not obtainable.

All responders should be reminded before approaching a scene by dispatch, incident commanders or safety officers to be alert to HazMat, even though no placards may be showing. **If HazMat is present, responders should consult with the VT HazMat Response Team crew chief, who is always available by pager by calling 1-800-641-5005.**

EMS should be notified well in advance if any victims may be contaminated and decontamination resources should be ordered early as there may be a lag of hours until decontamination systems are in place. If it is believed that contaminated victims have self-transported, hospitals should be alerted.



Members of Hartford Fire map out routes during an industrial fire. Credit | Hartford Fire Department

Border Crossing Data

An immense amount of data was obtained at the Highgate Springs and Derby international border crossings that span the entire 2016 year. Derby has 12,438 lines of data, while Highgate Springs has 18,535 lines of data. Both sets of data provided the placard number, date, and hour in which the hazardous material truck crossed from Canada into the U.S. Because the data files are so large, they are not included in this report. LEPC's interested in reviewing the data should please contact TRORC and it can be emailed to you.

With this wealth of data, a deeper analysis was able to be completed. Seasonal, monthly, daily, and hourly analysis was done.

Seasonal Patterns

The number of hazardous trucks that crossed the border was broken up into seasons to see what time of year trucks are most likely to travel into the U.S. Seasons are defined as the following:

- Winter: January, February, December
- Spring: March, April, May
- Summer: June, July, August
- Fall: September, October, November.

For both Highgate and Derby, winter was the season that experienced the most hazardous trucks. This is mostly

likely caused by the increase of heating oil needed during the winter months. Fall was the second most populous season, due to the same reasons as homes and businesses are filling up on heating oil in preparation for winter.

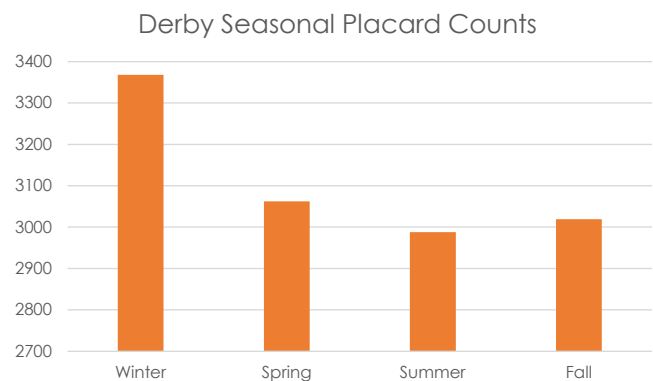


Figure 8: Derby Seasonal Placard Counts

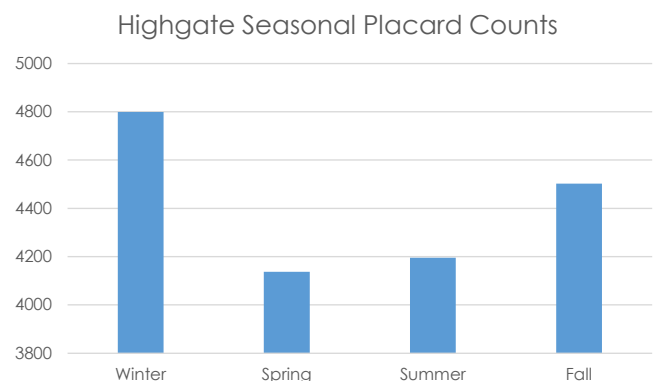


Figure 9: Highgate Seasonal Placard Counts

Border Crossing Data

Monthly Patterns

The seasonal data was further broken up into monthly categories. In Highgate, January experienced the heaviest hazardous truck occurrences. By looking at the rest of the months of the year, it appears that other months are very similar in hazardous truck volume.

In Derby, December experienced the heaviest truck volume. Similar to Highgate, the other months of the year had similar truck volumes crossing the border.

Highgate Monthly Placard Percentages

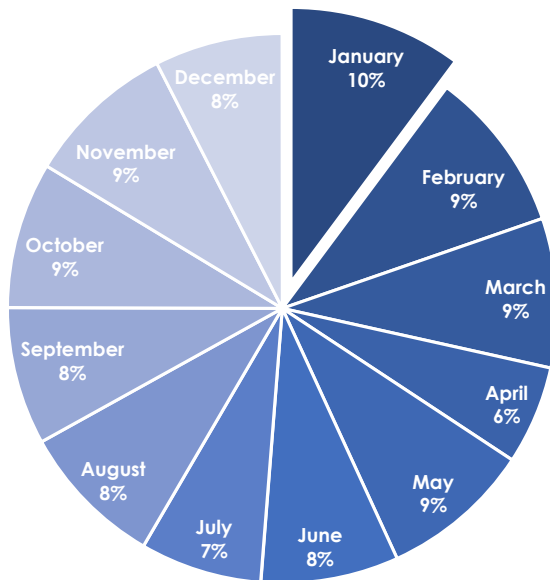


Figure 10: Highgate Monthly Placard Percentages

Derby Monthly Placard Percentages

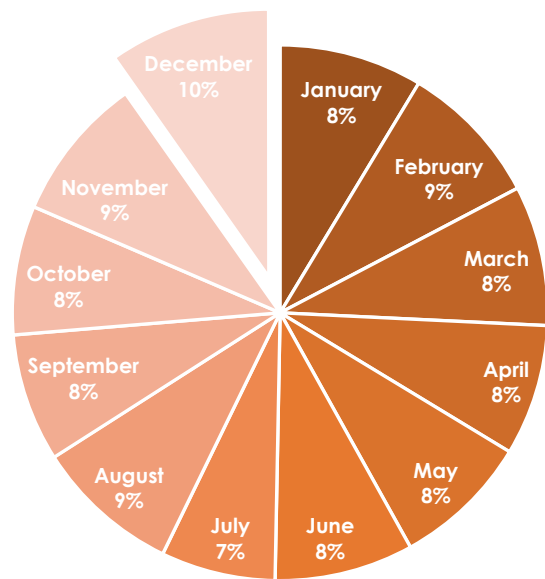


Figure 11: Derby Monthly Placard Percentages

Border Crossing Data

Daily Patterns

This data was then broken up by days of the weeks to show which day has the highest truck volume throughout 2016. For Highgate, the peak day was Tuesday, 19% of all hazardous trucks traveled through on this day. Wednesday (18%) and Thursday (18%) were close behind. Sunday (5%) experienced the least amount of traffic.

In Derby, the peak day was Wednesday at 20% of all hazardous trucks passing through. It was closely followed by Tuesday (19%) and Thursday (18%). Sunday (3%) experienced the least amount of traffic.

Both sites were very similar in that most of the hazardous material transportation occurs during the week.

Highgate Day of the Week Percentages

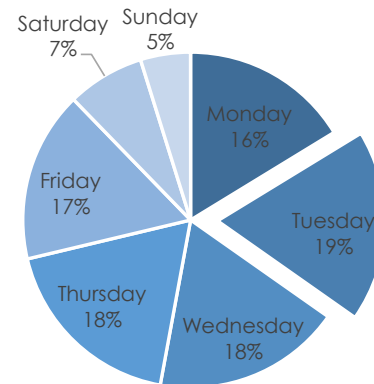


Figure 12: Highgate Day of the Week Percentages

Derby Day of the Week Percentages

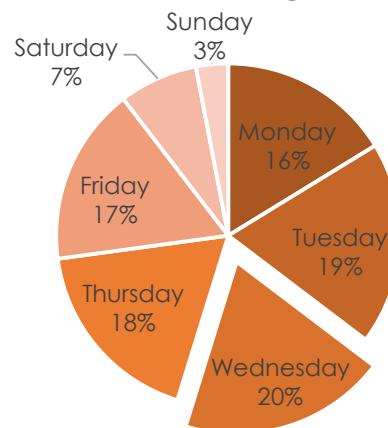


Figure 13: Derby Day of the Week Percentages

Border Crossing Data

Hourly Patterns

Hazardous Trucks Crossing the US/Canada Border by Time

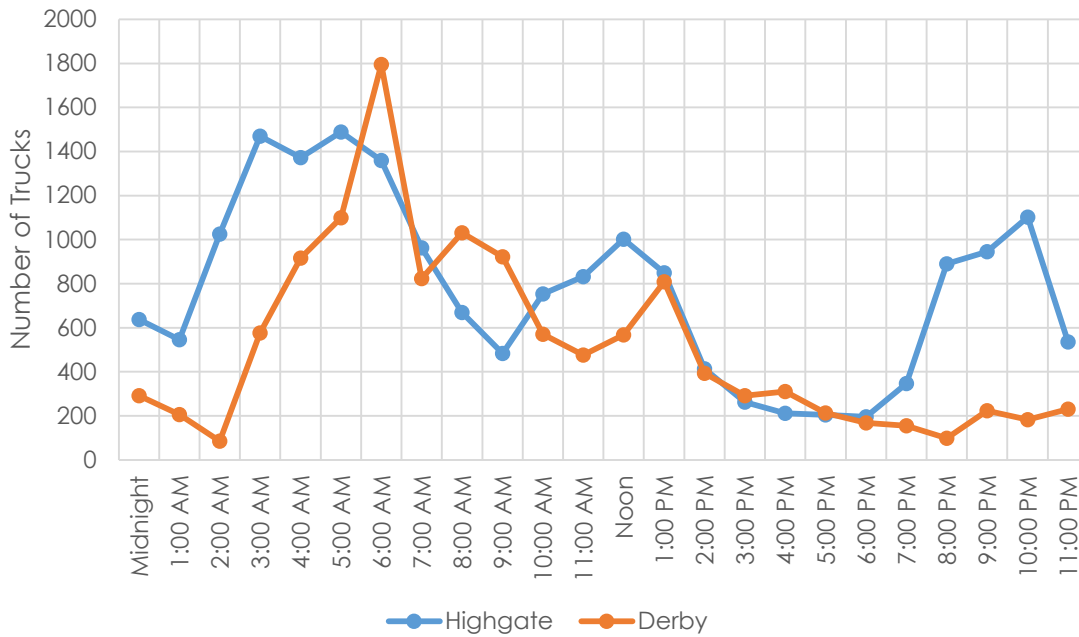


Figure 14: Hazardous Trucks Crossing the US/Canada Border by Time

In the Figure 14, you can see the comparison of peak times in which hazardous materials move through the major border crossings. Derby sees a sharp peak of the highest placarded loads from 6:00 to 6:59 a.m., while Highgate sees a longer peak traffic window 3:00 to 5:59 a.m. This is important data for fire departments near the border as their volunteer members are probably available but are not necessarily awake at these times.

A comparison of morning hours versus afternoon hours was also done between both sites. Highgate experienced 62% of all trucks traveled

during the morning hours (Midnight – 11:59 a.m.) and the remaining 38% of all trucks traveled during the afternoon hours (Noon-11:59 p.m.)

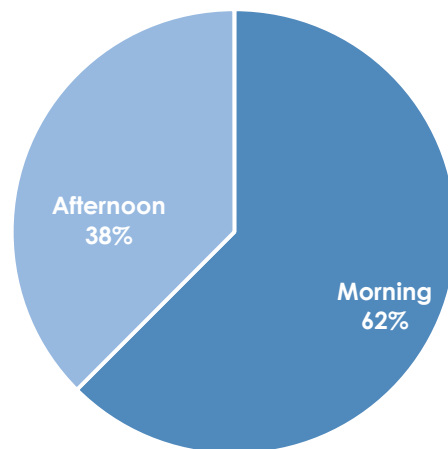


Figure 15: Highgate Peak Time Comparison Chart

Border Crossing Data

Derby was very similar in the 71% of all trucks traveled in the morning hours while the remaining 29% traveled during the afternoon hours.

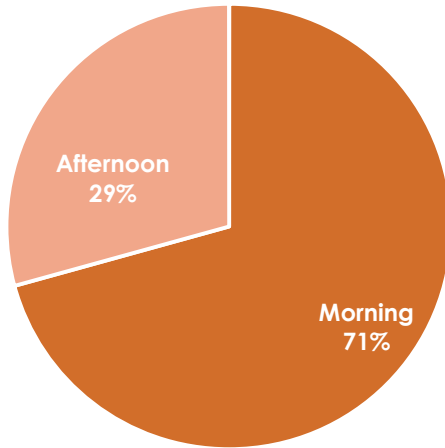


Figure 16: Derby Peak Time Comparison Chart

Petroleum vs. Non-Petroleum Products

As you can see in Figure 17, 90% of all hazardous trucks transported over the border are petroleum products. This is a large majority that speaks to Canada's main exports to the U.S and is similar to traffic in state.

This 90% totaled 27,913 of all placards recorded at both Highgate and Derby. The following placards are represented in this number; 1075, 1203, 1223, 1863, 1972, 1993, and 1202. Non-petroleum products made up 10% of the load.

Petroleum vs. Non-Petroleum

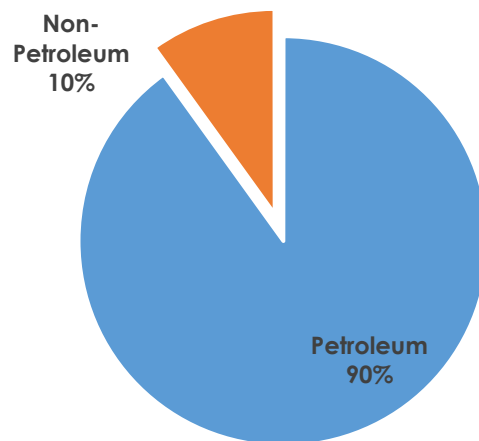


Figure 17: Petroleum vs. Non-Petroleum

Liquid Fuels vs. Compressed/Liquified Gases

Unlike the rest of the survey sites in Vermont, the border crossing sites experienced a large disparity in the amount of petroleum-related liquid fuels (primarily gasoline at 92%) versus compressed/liquified petroleum-related gas (8%) that was transported. of This once again reiterates Canada's large export of oil and gasoline to the United States.

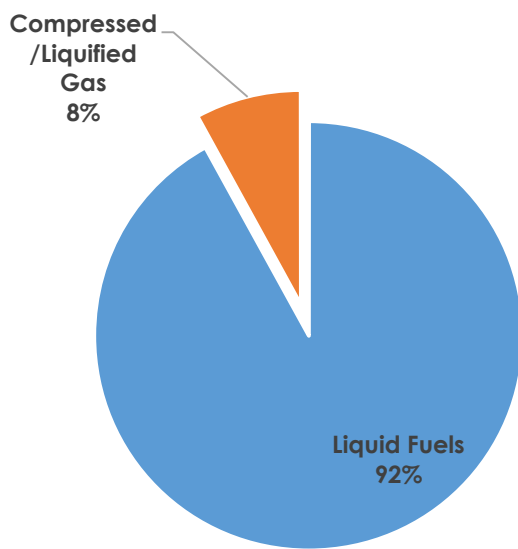


Figure 18: Liquified Fuel vs. Compressed/Liquified Gas

Conclusion

It is highly recommended that all first responders should be at the HAZMAT Awareness level, and have on hand the latest version of the Emergency Response Guidebook. There is even a free cell phone application where you can literally have the ERG at your fingertips. Responder life safety is priority.

A first responder is defined as an individual who is a police officer, firemen/firewoman, EMT, or paramedic.

It is difficult for most fire departments to be trained and equipped to deal with HAZMAT, but every department has access to the VT HAZMAT Response Team 24/7 by calling 1-800-641-5005. A good word of advice is to write this number down in several places so it is easily accessible during an emergency situation.

Calling this number should be the first action taken as soon as HAZMAT is suspected. Team expertise is available by phone/radio within minutes and they can have assets on scene in a few hours.

Given the data from this flow study, liquified and gas petroleum products are the most likely hazardous materials to be encountered. These materials have special response needs but are relatively similar. However, unless details of a HAZMAT call are well known at the time of dispatch, each scene should be approached with

extreme caution. ERG Guide #111 is a good basic approach for unknown situations.

HAZMAT should be expected at all scenes until ruled out, even with non-placarded roads.



*Hartford Fire responds to a large industrial fire in White River Junction. This fire was also a HAZMAT situation.
Credit | Hartford Fire Department*

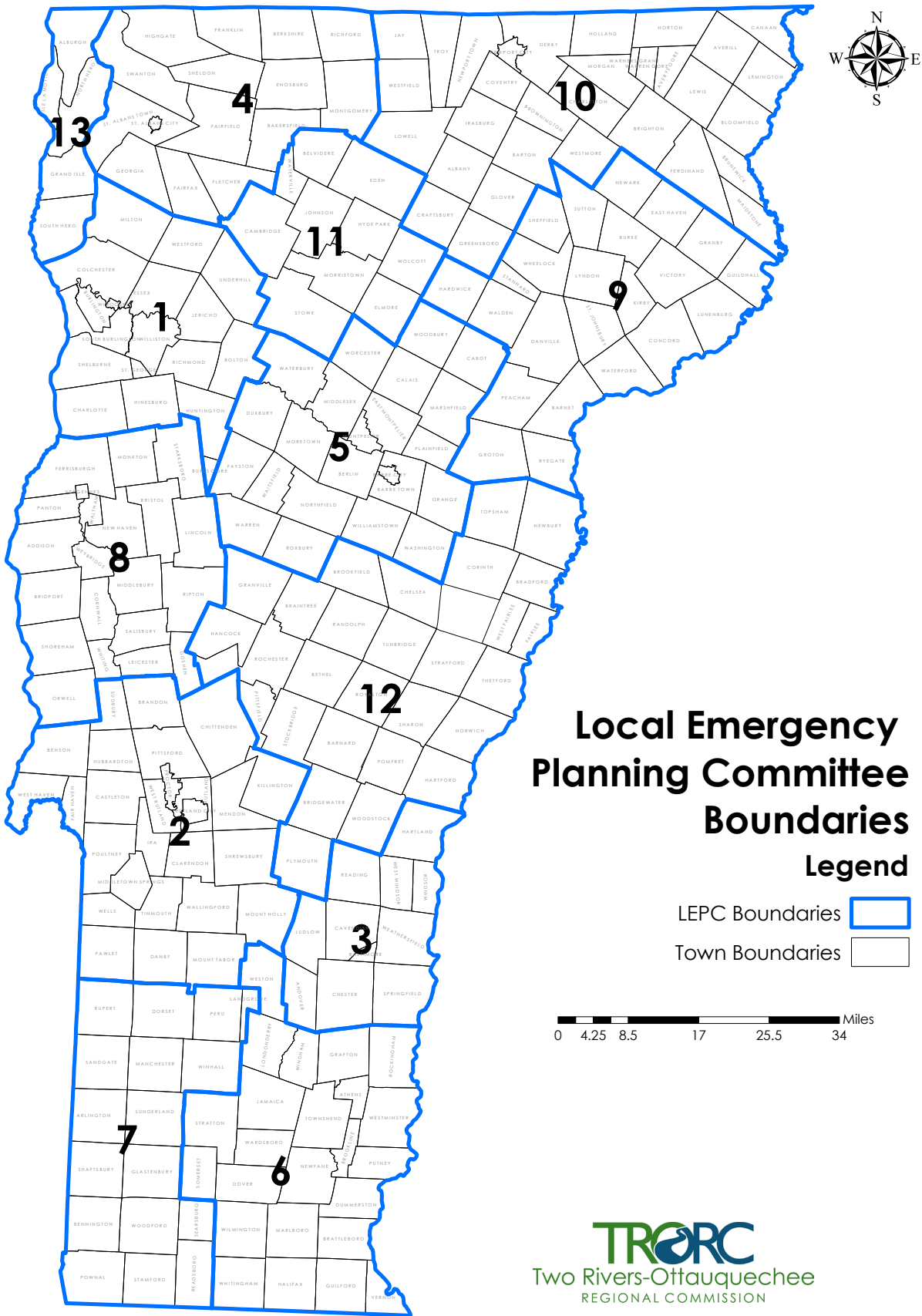
Data by Local Emergency Planning Committee

In Vermont, there are a total of thirteen Local Emergency Planning Committee's (LEPC). LEPC's were created under the Emergency Planning and Community Right-to-Know Act (EPCRA). EPCRA is regulated under the U.S. Environmental Protection Agency (EPA). The purpose of these organizations is to create an emergency response plan and provide information about chemicals in the community to citizens. LEPC's are made up of a number of different individuals that include but are not limited to; elected state and local officials, police, fire, public health professionals, facility representatives, and hospital officials.

The placard data has been organized by LEPC based on where the survey location was. Within each LEPC section of this report, you will find individual data on each site that includes the percentages of each placard per site, as well as the raw data that was taken at each survey.

Location	LEPC
Essex	1
Colchester	1
South Burlington	1
Castleton	2
Killington	2
Rutland	2
Weathersfield	3
Highgate Border Crossing	4
Saint Albans	4
Waterbury	5
Montpelier	5
Barre	5
Guilford Weigh Station	6
Brattleboro (US 5)	6
Brattleboro (VT 9)	6
Manchester	7
Bennington	7
Arlington	7
Addison	8
Middlebury	8
Vergennes	8
Guildhall*	9
I-91 (Lyndon)*	9
Danville	9
Derby Border Crossing	10
Morrisville	11
Stowe	11
Hyde Park	11
I-91 (WRJ)*	12
Hartford	12
Newbury	12
Woodstock	12
Alburgh	13


Table 8: Flow study locations by LEPC

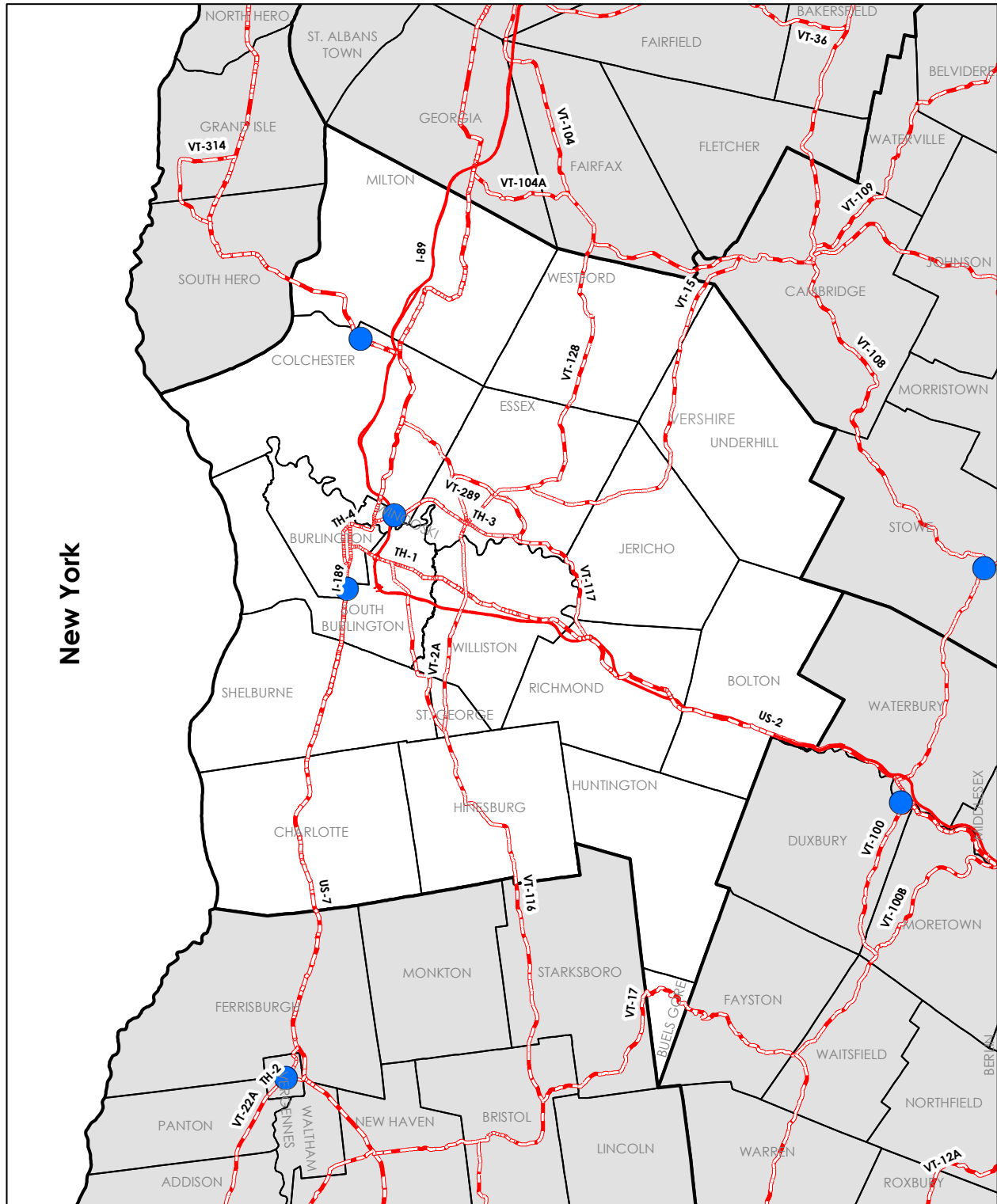
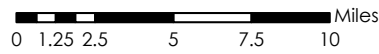


Map 2: LEPC Boundaries

HMEP Locations

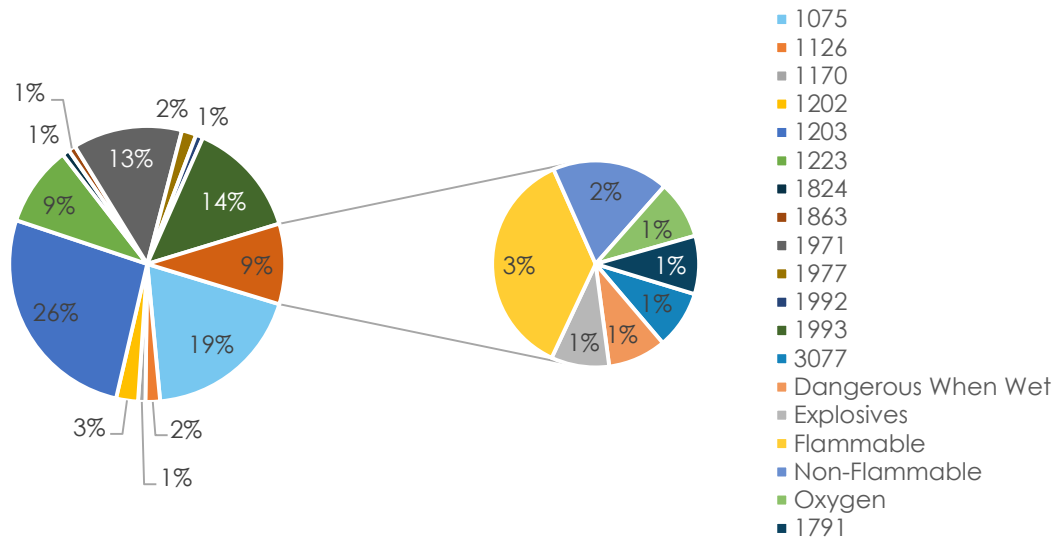
LEPC # 1

 Study Areas



LEPC #1

LEPC #1



Chair: Al Barber

RPC: Chittenden County Regional Planning Commission

Phone: (802) 846-4490 ext. 25

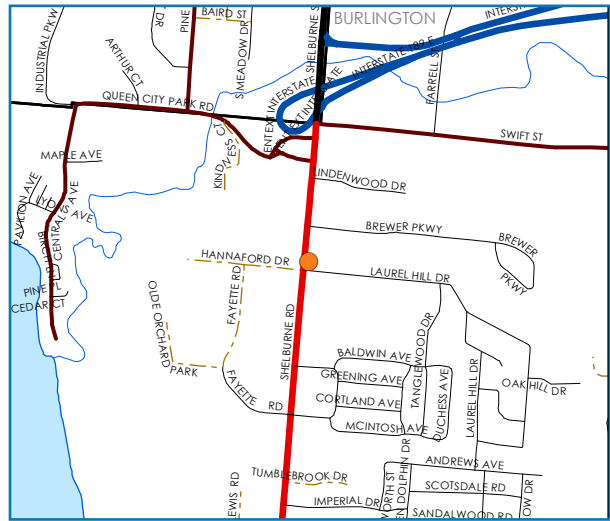
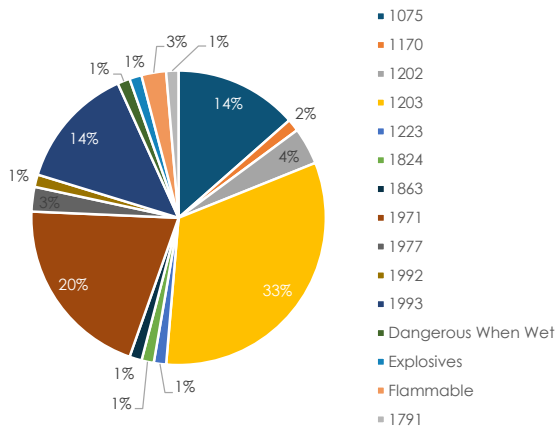
Website: www.ccrpcvt.org/about-us/committees/local-emergency-planning-committee/

LEPC#1 c/o CCRPC

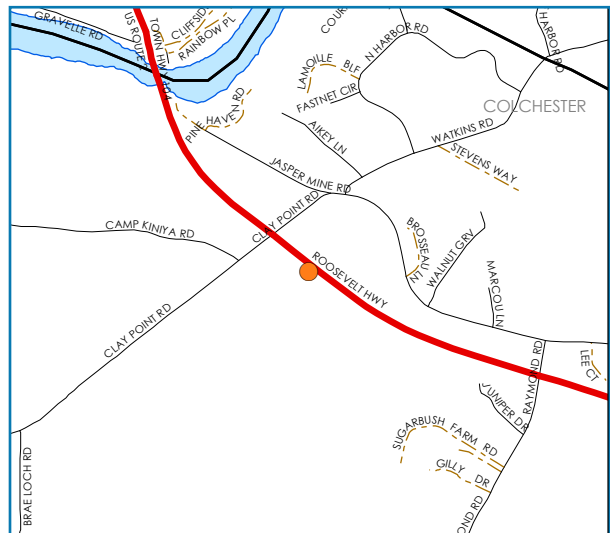
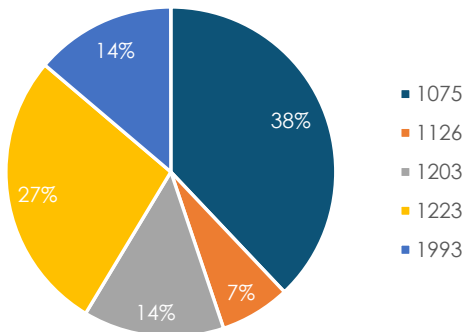
110 West Canal Street, Suite 202

Winooski, VT 05404-2109

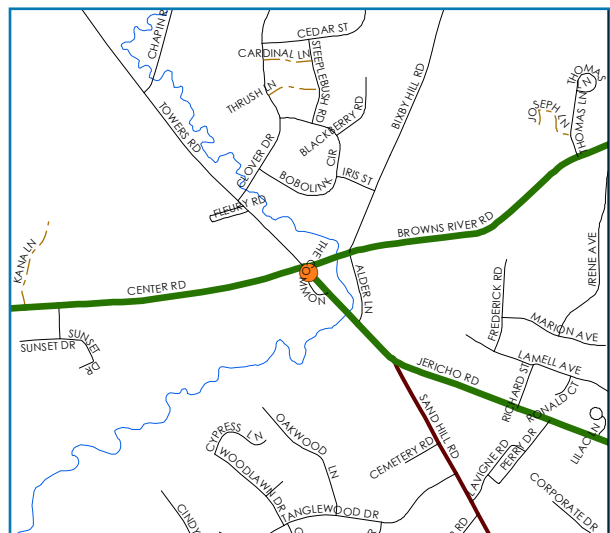
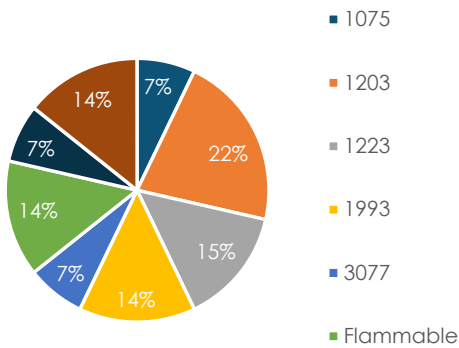
South Burlington - US 7 North/South



Colchester - US 2 East/West



Essex - VT 15 East/West



South Burlington US Route 7				
Date: 11/04/16		12:30 PM-4:30 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:30 PM	1075	North	Propane	Small truck
12:31 PM	1993	North	Propane/ Oil Truck	Small truck
1:09 PM	1993	South	Propane/ Oil Truck	Small truck
1:20 PM	1971	South	Box Truck	10 Wheel/ 3 axle
1:24 PM	1993	South	Fuel Truck	18 Wheel/ 5 axle
1:29 PM	1971	North	Box Truck	10 Wheel/ 3 axle
1:30 PM	Explosives 1.1 D	North	Box Truck	Orange Sign
1:35 PM	1203	North	Fuel Truck	18 Wheel/ 5 axle
1:37 PM	1971	South	Box Truck	12 Wheel/ 4 axle
1:44 PM	1971	North	Box Truck	18 Wheel/ 5 axle
1:46 PM	1075	South	Propane Truck	18 Wheel/ 5 axle
1:50 PM	1971	North	Box Truck	18 Wheel/ 5 axle
1:54 PM	1203	North	Fuel Truck	22 Wheel 6 axle
2:00 PM	1202	South	Fuel Truck	18 Wheel/ 5 axle
2:10 PM	1203	North	Fuel Truck	18 Wheel/ 5 axle
2:11 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
2:15 PM	1075	South	Fuel Truck	18 Wheel/ 5 axle
2:28 PM	1977	South	Fuel Truck	Nitrogen Rated Liquid
2:36 PM	1075	South	Box Truck	18 Wheel/ 5 axle
2:36 PM	1971	South	Box Truck	18 Wheel/ 5 axle
3:00 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
3:00 PM	1075	North	Small Propane Truck	6 Wheel/ 2 axle
3:01 PM	1971	South	Box Truck	18 Wheel/ 5 axle
3:15 PM	1971	North	Box Truck	18 Wheel/ 5 axle
3:17 PM	1203	North	Fuel Truck	18 Wheel/ 5 axle
3:40 PM	1075	North	Small Propane Truck	6 Wheel/ 2 axle
3:50 PM	1971	North	Box Truck	methane Compressed 18 Wheel/ 5 axle
4:00 PM	1075	South	Propane Truck	18 Wheel/ 5 axle
4:10 PM	1971	South	Box Truck	18 Wheel/ 5 axle

South Burlington US Route 7				
Date: 3/17/17		12:15 pm- 4:15pm		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:31 PM	1971	North	Box Truck	10 Wheel/ 3 axle
12:34 PM	1971	North	Box Truck	10 Wheel/ 3 axle
12:40 PM	1992	South	Fuel Truck	18 Wheel/ 5 axle
12:46 PM	1993	North	Propane Truck	6 Wheel/ 2 axle
12:53 PM	1971	South	Box Truck	10 Wheel/ 3 axle
12:58 PM	1993	South	Fuel Truck	10 Wheel/ 3 axle
1:12 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
1:22 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
1:26 PM	1203	North	Fuel Truck	22 Wheel/ 6 axle
1:28 PM	1203	North	Fuel Truck	22 Wheel/ 6 axle
1:38 PM	1203	North	Fuel Truck	18 Wheel/ 5 axle
2:10 PM	1993	South	Fuel Truck	18 Wheel/ 5 axle
2:11 PM	1203	South	Fuel Truck	22 Wheel/ 6 axle
2:36 PM	1203	North	Fuel Truck	18 Wheel/ 5 axle
2:40 PM	1993	South	Propane Truck	6 Wheel/ 2 axle
2:41 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
2:52 PM	1971	South	Box Truck	18 Wheel/ 5 axle
3:04 PM	1993	North	Propane Truck	6 Wheel/ 2 axle
3:08 PM	1203	North	Fuel Truck	22 Wheel/ 6 axle
3:20 PM	1203	South	Fuel Truck	18 Wheel/ 5 axle
3:21 PM	1075	North	Fuel Truck	18 Wheel/ 5 axle
3:22 PM	1993	North	Propane Truck	6 Wheel/ 2 axle
3:23 PM	Dangerous When Wet	South	Box Truck	Blue Sign
3:57 PM	1202	North	Fuel Truck	22 Wheel/ 6 axle
3:58 PM	1075	North	Propane Truck	6 Wheel/ 2 axle

South Burlington US Route 7				
Date: 5/19/17		8:30 AM-12:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:48 AM	1203	North	Oil	18 Wheel/ 5 axle
9:02 AM	1203	North	Oil	18 Wheel/ 5 axle
9:06 AM	1203	North	Oil	18 Wheel/ 5 axle
9:25 AM	1824	North		18 Wheel/ 5 axle
9:31 AM	Flamable Gas 2 Green & Red Placard	South		10 Wheel/ 3 axle
9:32 AM	Flamable Gas 2; 1791 Corrosive	North		10 Wheel/ 3 axle
9:45 AM	1203	South	Oil	18 Wheel/ 5 axle
9:57 AM	1203	South	Oil	18 Wheel/ 5 axle
10:07 AM	1971	North		18 Wheel/ 5 axle
10:22 AM	1170	South		box truck
10:25 AM	1203	North		22 Wheel/ 6 axle
10:43 AM	1075	North	Propane	6 Wheel/ 2 axle
10:53 AM	1863	South		22 Wheel/ 6 axle
11:08 AM	1203	South	Oil	18 Wheel/ 5 axle
11:23 AM	1977	South	Gas	18 Wheel/ 5 axle
11:26 AM	1203	South	Oil	18 Wheel/ 5 axle
11:42 AM	1223	South		6 Wheel/ 2 axle
12:00 PM	1993	North		6 Wheel/ 2 axle
12:05 PM	1202	North		22 Wheel/ 6 axle

Colchester US Route 2				
Date: 5/18/2017			Noon - 4:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:07 PM	1223	South	Home Delivery	Kerosene
12:31 PM	1223	South	Home Delivery	Kerosene
1:10 PM	1075	South	Home Delivery (3000 gallon)	Propane
1:38 PM	1993	South	Home Delivery (5000 Gallon)	Fuel Oil
1:43 PM	1126	North	Tanker (9,000 gallon)	Diesel
1:54 PM	1075	South	Tow Truck	Propane
2:03 PM	1075	South	Home Delivery (3000 gallon)	Propane
2:24 PM	1993	South	Home Delivery (5000 gallon)	Fuel Oil
3:31 PM	1223	South	Home Delivery (3000 gallon)	Kerosene
3:58 PM	1075	North	Home Delivery (3000 gallon)	Propane

Colchester US Route 2				
Date: 5/25/2017			Noon - 4:00 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:09 PM	1223	South	Home delivery	Kerosene
12:28 PM	1223	South	Home delivery	Kerosene
1:05 PM	1075	South	Home delivery	Propane
1:31 PM	1203	South	Tanker (9,000 gallons)	Gasoline
1:40 PM	1075	South	Home Delivery	Propane
1:58 PM	1075	South	Home Delivery	Propane
2:07 PM	1126	North	Delivery (3,000 gallon)	Diesel
2:17 PM	1223	North	Home delivery	Kerosene
2:37 PM	1203	South	Tanker (9,000 gallons)	Gasoline
3:20 PM	1993	South	Home Delivery	Fuel Oil
3:43 PM	1075	South	500 Gallon Delivery	Propane

LEPC #1

Colchester US Route 2				
Date: 6/1/2017		Noon - 4:00 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:18 PM	1075	S	Home Delivery (3,000 gallon)	Propane
12:50 PM	1993	S	Home Delivery (3,000 gallon)	Fuel Oil
1:28 AM	1203	S	Tanker	Gasoline
1:40 PM	1075	S	Home Delivery (3,000 gallon)	Propane
1:58 PM	1075	S	Home Delivery (3,000 gallon)	Propane
2:12 PM	1223	N	Home Delivery (3,000 gallon)	Kerosene
2:42 PM	1203	S	Tanker	Gasoline
3:14 PM	1223	S	Home Delivery (3,000 gallon)	Kerosene

Essex VT Route 15				
Date: 11/04/2016			Time: 8:15- 12:15	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:46 AM	1993	East	Propane	
10:00 AM	Oxygen 2	East	Cargo Van	
10:15 AM	1223	East	Propane/ Oil Truck	
11:20 AM	Flamable Gas 2/ Non Flamable Gas 2	East	Small Box Truck	
11:21 AM	1223	East	Propane/Oil Truck	
11:30 AM	Flamable Gas 2/ Non Flamable Gas 2	West	Small Box Truck	

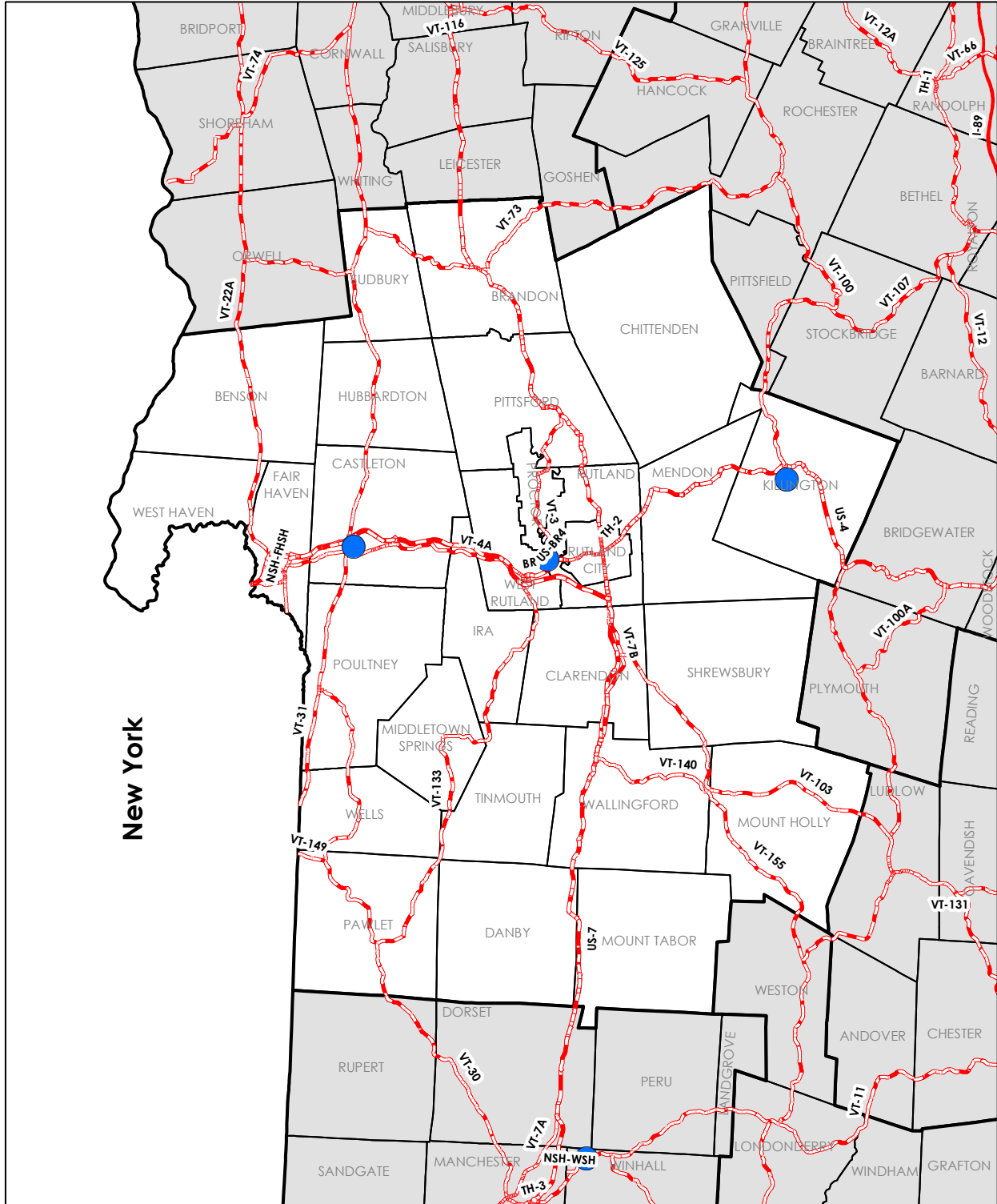
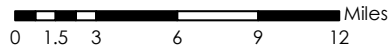
Essex VT Route 15				
Date: 3/17/17			7:45 AM-11:45AM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
9:01 AM	1993	West	Propane/ Oil Truck	6 wheel / 2 axle
10:46 AM	1203	East	Gasoline Truck	22 wheel/6 axle
10:51 AM	1203	East	Gasoline Truck	22 wheel/6 axle

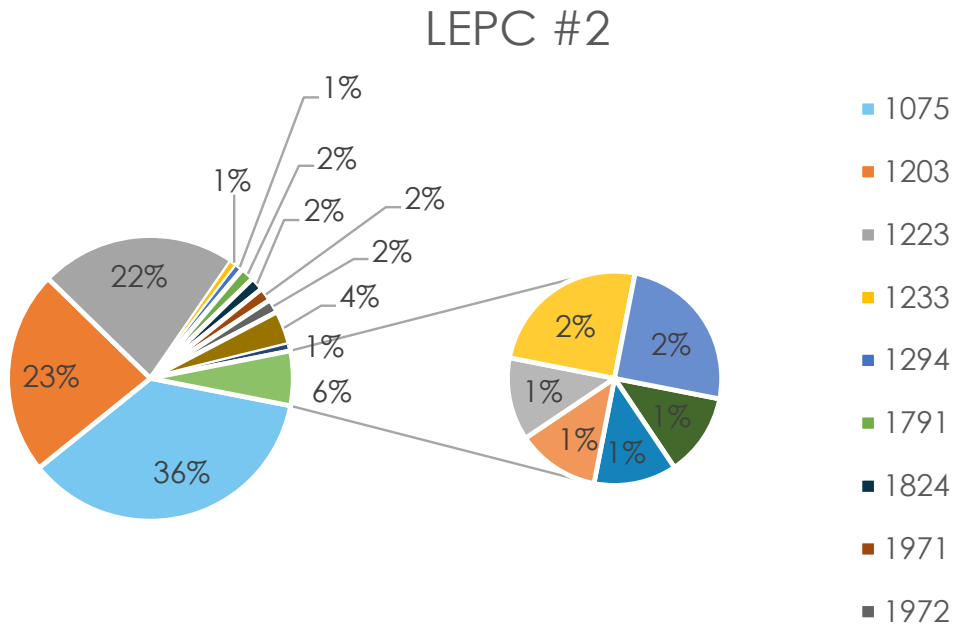
Essex VT Route 15				
Date: 5/19/17			Time: 12:50- 4:50 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
1:01 PM	1203	West	Oil	10 Wheel/ 3 axle
1:21 PM	1075	West	Propane	6 Wheel/ 2 axle
3:07 PM	3077	West		Box Truck

LEPC #2

HMEP Locations

LEPC # 2  Study Areas





Chair: Robert Schlachter

RPC: Rutland County Regional Planning Commission

Phone: (802) 775-0871

Website: <https://www.rutlandrpc.org/pages/emergency-management/17/>

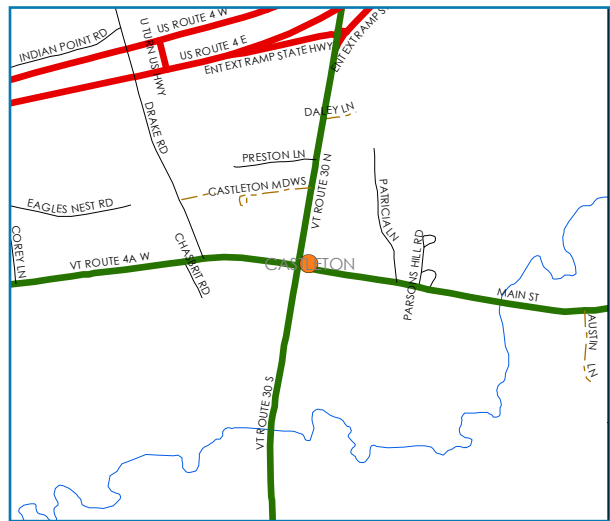
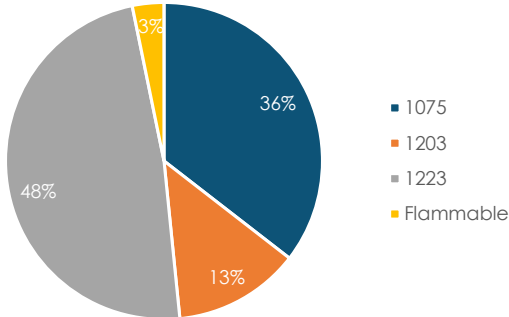
LEPC#2

PO Box 975

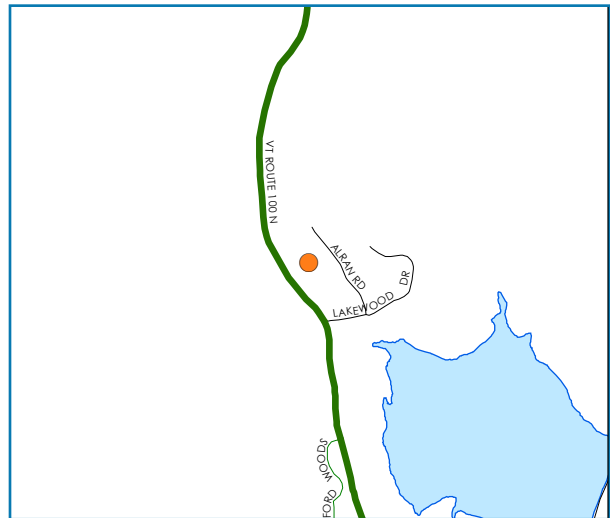
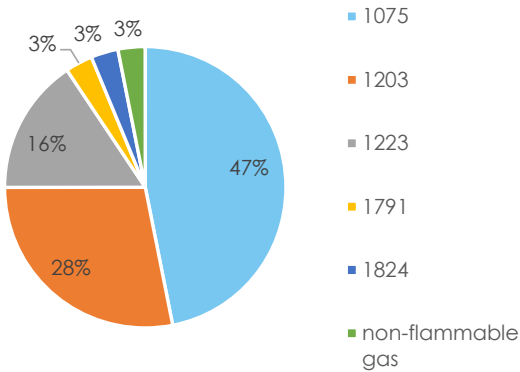
Rutland, VT 05702

LEPC #2

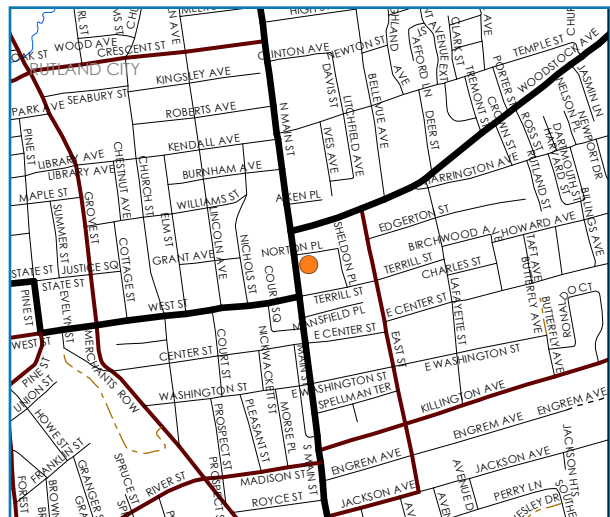
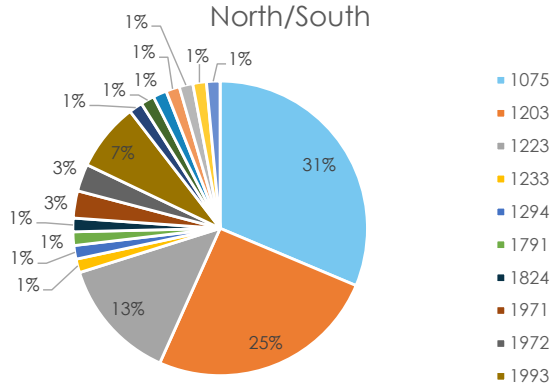
Castleton - RT 30 North/South



Killington - VT Route 100 North/South



Rutland - US 7 North/South



Castleton VT Route 30				
Date: 3/21/2017			8:00 AM - Noon	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:29 AM	1075	south	propane	
8:44 AM	1075	south	propane	
8:46 AM	1223	south	oil	
8:46 AM	1223	north	oil	
9:14 AM	1223	north	oil	
9:15 AM	1075	north	propane	
9:18 AM	1223	north	oil	
9:43 AM	12233	north	oil	
9:43 AM	1223	south	oil	
9:44 AM	1075	south	oil	
9:52 AM	1223	south	oil	

LEPC #2

Castleton VT Route 30				
Date: 4/27/2017			8:00 AM - Noon	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
8:11 AM	1223	south	propane	
8:14 AM	1223	north	propane	
8:25 AM	1075	south	propane	
8:31 AM	1203	south	propane	
8:35 AM	1223	north	propane	
8:43 AM	1223	south	propane	
9:16 AM	1075	north	propane	
9:17 AM	1075	south	box truck	propane tanks
9:37 AM	1203	south	oil	
9:38 AM	1075	south	propane	
10:22 AM	1203	north	18 wheeler	
11:12 AM	1203	north	propane	

Castleton VT Route 30				
Date: 6/5/2017			8:00 AM - Noon	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:00 AM	1075	south	small tanker	
8:01 AM	1223	south	small tanker	
8:03 AM	1223	south	small tanker	
9:40 AM	1075	north	big tanker	
9:49 AM	1223	north	small tanker	
10:07 AM	1075	south	small tanker	
10:59 AM	flammable gas	north	4 wheels	
11:09 AM	1223	north	small tanker	

LEPC #2

Killington VT Route 100				
Date: 10/28/2016		8:35 AM - 12:35 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:51 AM	1203	south	18 wheel propane	
9:02 AM	1223	south	propane	
9:37 AM	1203	north	18 wheel propane	
9:48 AM	non-flammable gas	south	truck	green placard
10:00 AM	1075	north	propane	
10:19 AM	1203	north	18 wheel propane	
10:23 AM	1223	north	oil	
10:29 AM	1075	north	propane	
12:24 PM	1075	north	oil	

Killington VT Route 100				
Date: 3/29/2017		11:30 AM - 3:30 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
11:42 AM	1824, 1203	south	box truck	
11:47 AM	1075	south	18 wheeler	
11:54 AM	1075	south	utility truck	
12:27 PM	1791	south	18 wheeler	
12:27 PM	1075	south	propane	
12:29 PM	1203	north	18 wheeler	
12:34 PM	1075	south	propane	
12:44 PM	1075	south	propane	
1:22 AM	1223	north	oil	
2:17 AM	1075	north	oil	
2:39 AM	1075	north	oil	

Killington VT Route 100				
Date: 5/1/2017			8:00 AM - Noon	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:00 AM	1075	south	oil	
8:04 AM	1075	south	oil	
8:42 AM	1075	north	18 wheeler	
8:43 AM	1203	south	oil	
8:52 AM	1203	south	18 wheeler	
9:10 AM	1223	south	oil	
9:49 AM	1203	north	oil	
10:02 AM	1223	north	oil	
10:22 AM	1075	north	oil	
10:47 AM	1075	north	oil	
11:33 AM	1203	north	18 wheeler	

LEPC #2

Rutland US Route 7				
Date: 3/21/2017		12:20 PM - 4:20 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:02 PM	199	North	18 wheeler	
12:25 PM	107	South	18 wheeler	
12:27 PM	1075	North	propane	
12:42 PM	1223	North	propane	
12:44 PM	1927	North	18 wheeler	
1:00 PM	flammable	North	10 wheel	
1:00 PM	1223	South	propane	
1:02 PM	1075	North	propane	
1:18 PM	1993	North	propane	
1:23 PM	1223	North	oil	
1:31 PM	1203	North	18 wheeler	
1:32 PM	1830, 1182, nonflammable	South	18 wheeler	more placards but they were hard to see at the speed and distance the truck was traveling
1:38 PM	1223	North	propane	
1:40 PM	199	South	propane	
1:52 PM	1075	South	propane	
1:52 PM	1075	South	propane	
1:52 PM	1791	South	18 wheeler	
2:00 PM	122	South	oil	
2:00 PM	1075	South	propane	
2:01 PM	1223	North	oil	
2:23 PM	1203	North	18 wheeler	
2:35 PM	1075	North	propane	
2:40 PM	1075	North	propane	


Time	Placard Number	Direction	Vehicle Type	Comments
3:05 PM	1203	North	18 wheeler	
3:21 PM	1972	South	18 wheeler	
3:21 PM	1203	North	18 wheeler	
3:40 PM	1075	North	propane	
3:45 PM	1203	North	18 wheeler	

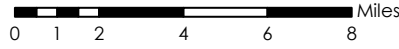
Rutland US Route 7				
Date: 4/27/2017		12:20 PM - 4:20 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:27 PM	1971	North	18 wheeler	
12:45 PM	1294	South	18 wheeler	
1:00 PM	1972	South	18 wheeler	
1:02 PM	1075	North	propane	
1:14 PM	13222301	North	18 wheeler	
1:34 PM	1075	North	propane	
1:44 PM	1203	North	18 wheeler	
2:09 PM	1203	North	18 wheeler	
2:22 PM	1075	South	propane	
2:25 PM	1993	North	propane	
2:26 PM	1075	North	propane	
2:26 PM	1075	South	18 wheeler	
2:32 PM	1203	North	18 wheeler	
2:48 PM	1075	South	propane	
3:08 PM	1203	North	propane	
3:26 PM	1075	South	propane	

Rutland US Route 7				
Date: 6/5/17		12:30 PM - 4:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:54 PM	1233	North	propane	
12:59 PM	1203	North	tanker	
1:21 PM	1075	South	propane	
1:26 PM	1203	South	propane	
1:50 PM	1203	South	propane	
2:01 PM	1203	South	propane	
2:02 PM	1993	North	propane	
2:04 PM	1075	North	propane	
2:10 PM	1942, 3375	South	utility truck	
2:41 PM	1203	North	propane	
2:43 PM	1223	North	propane	
3:00 PM	1075	South	propane	
3:12 PM	1223	South	propane	
3:14 PM	1824	North	propane	
3:37 PM	1075	South	propane	
3:45 PM	1203	South	propane	
3:53 PM	1075	South	propane	
4:12 PM	1203	South	propane	
4:16 PM	1203	South	propane	
4:28 PM	1223	North	propane	

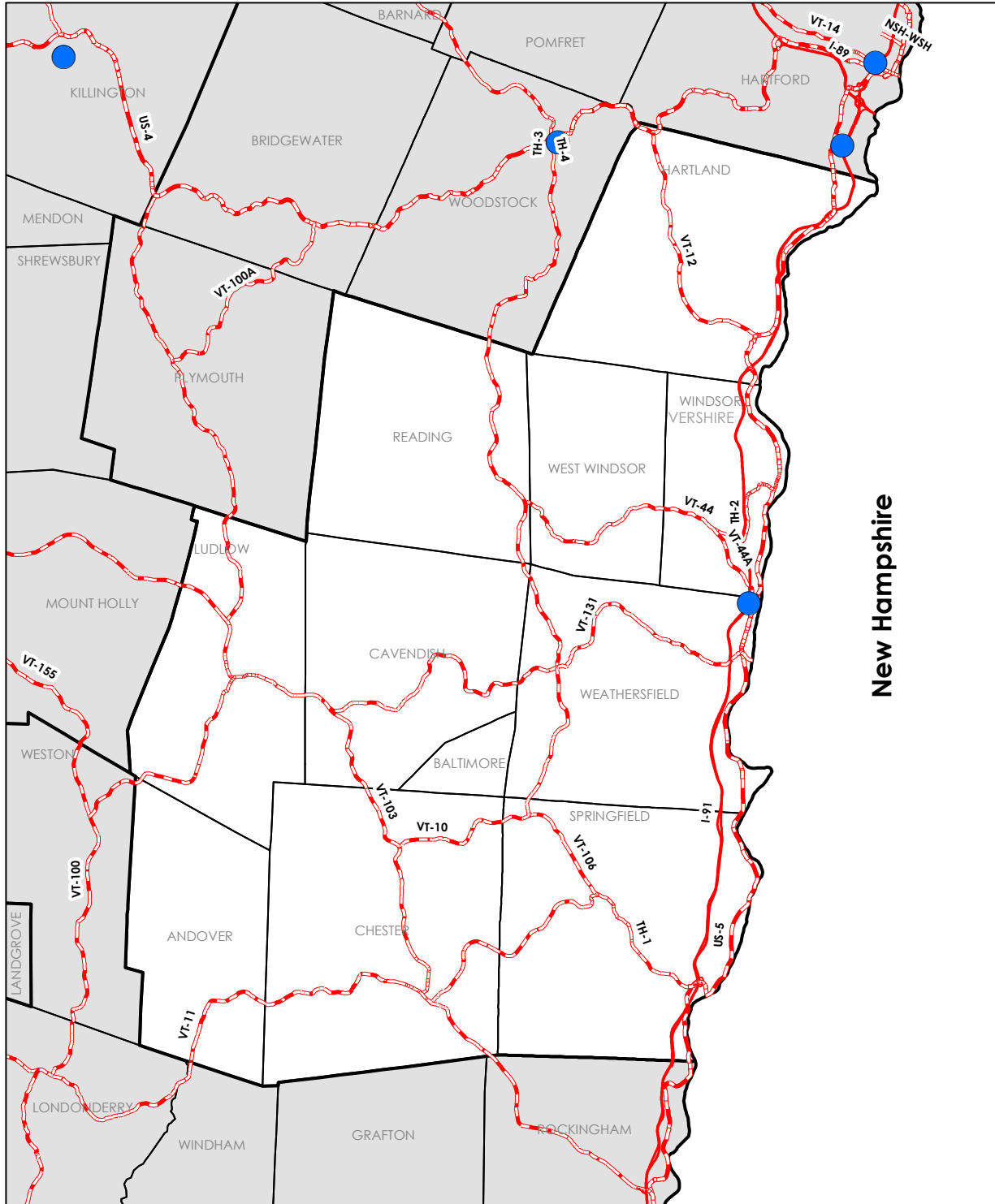
HMEP Locations

LEPC # 3

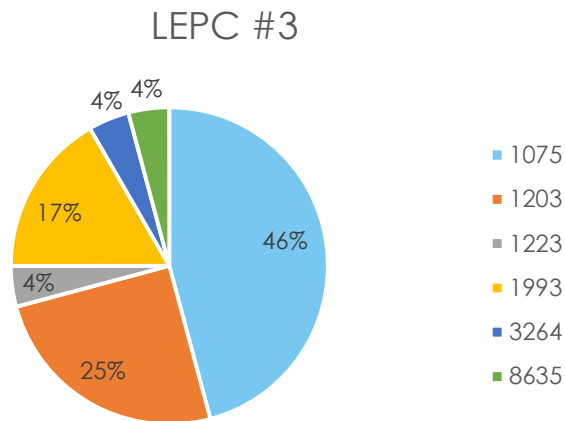
 Study Areas



TRORC
Two Rivers-Ottawaquechee
REGIONAL COMMISSION



LEPC #3



Chair: Jack Schonberg

RPC: Southern Windsor County Regional Planning Commission

Phone: (802) 674-9201

Website: <http://swcrpc.org/lepc3/>

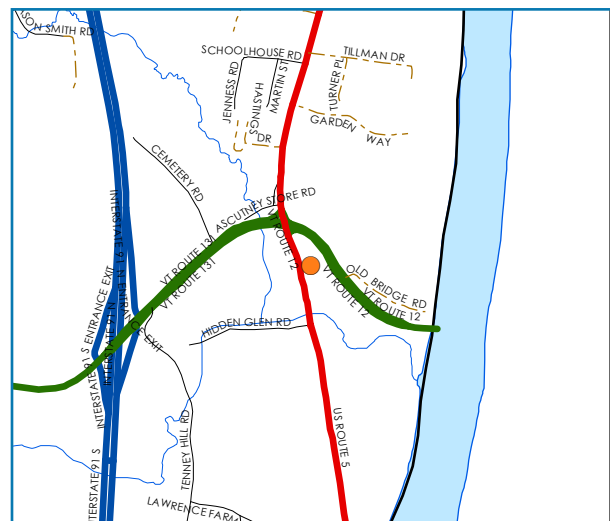
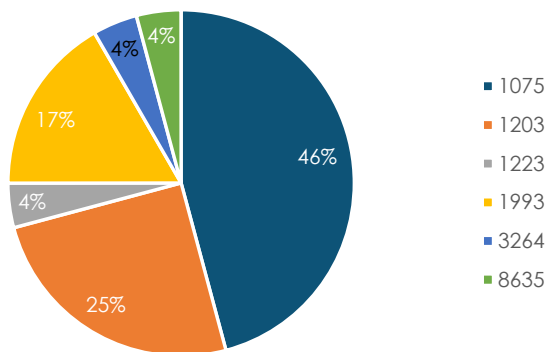
LEPC#3 c/o SWCRPC

Ascutney Professional Building

PO Box 320

Ascutney, VT 05030

Weathersfield - VT Route 12 West



Weathersfield VT Route 12				
Date: 4/11/2017			9:00 AM - 1:00 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
9:06 AM	1075	West	18	
9:42 AM	1993	West	oil	
9:50 AM	1993	West	oil	
10:59 AM	1993	West	oil	
11:05 AM	1993	West	oil	
11:22 AM	1223	West	18	
12:45 PM	3264	West	18	


Weathersfield VT Route 12				
Date: 5/22/17			8:00 AM - Noon	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:05 AM	1075	West	18	
8:07 AM	863	West	18	
8:09 AM	1203	West	18	
8:44 AM	1075	West	propane	
8:56 AM	1203	West	18	
9:19 AM	1075	West	18	
9:53 AM	1075	West	18	
10:34 AM	1203	West	18	
10:55 AM	1075	West	18	
11:28 AM	1075	West	propane	

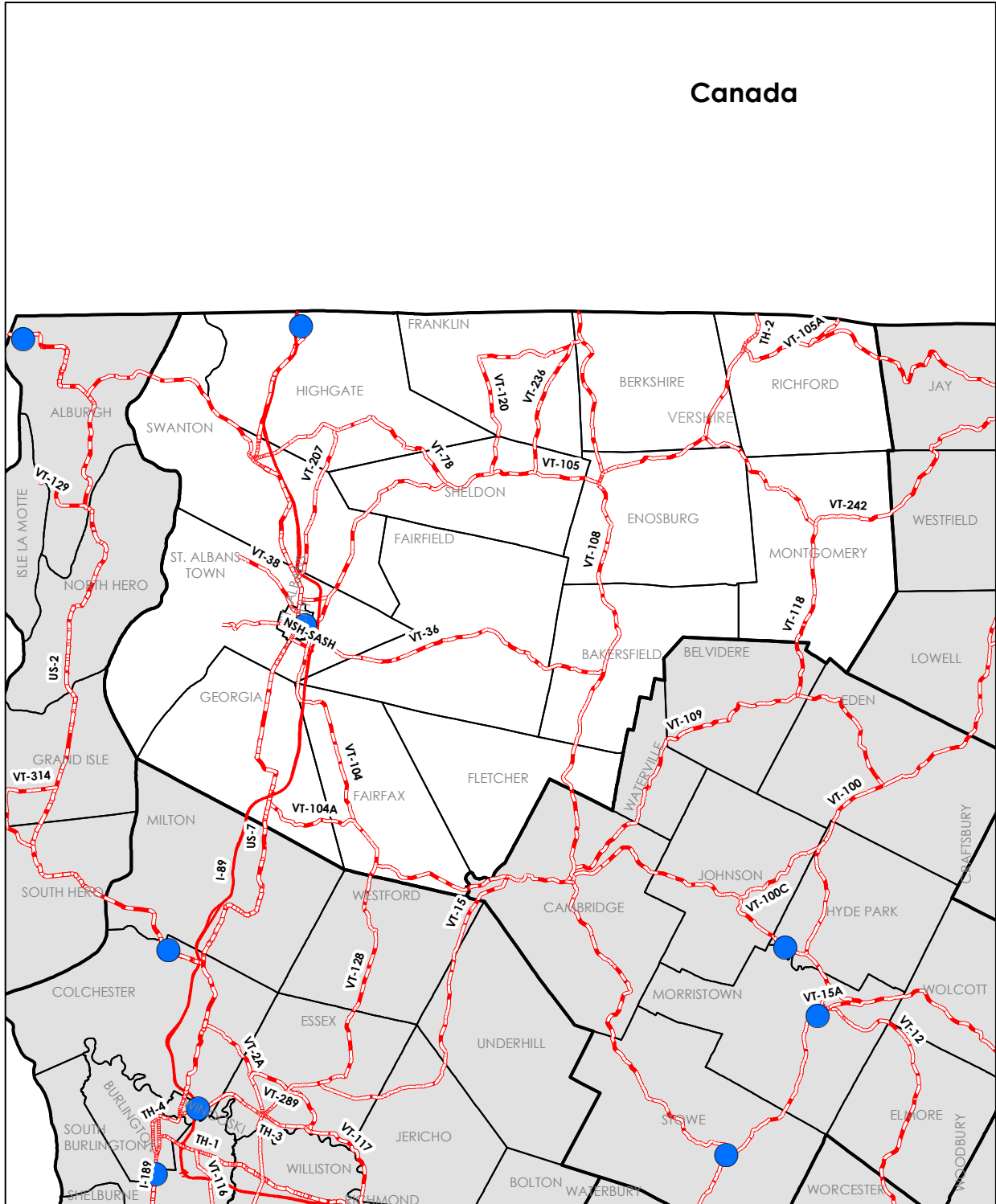
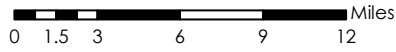
LEPC #3

Weathersfield VT Route 12				
Date: 11/1/2016		8:45 AM - 12:45 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:45 AM	1075	West	18 wheeler	
9:49 AM	1203	West	18 wheeler	
10:55 AM	1075	West	18 wheeler	
11:06 AM	1203	West	18 wheeler	
11:23 AM	1075	West	propane	
12:16 PM	1075	West	18 wheeler	
12:25 PM	1203	West	18 wheeler	

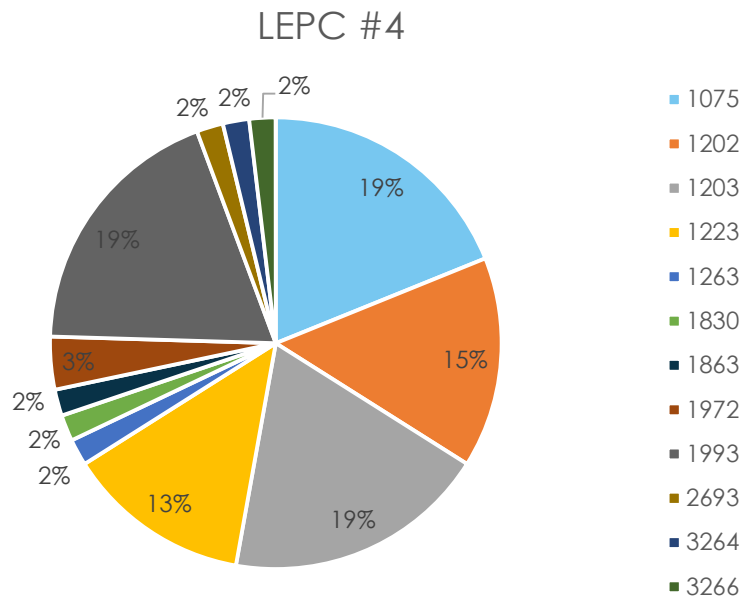
HMEP Locations

LEPC # 4

 Study Areas



LEPC #4



Chair: Judy Dunn

RPC: Northwest Regional Planning Commission

Phone: (802) 524-5958

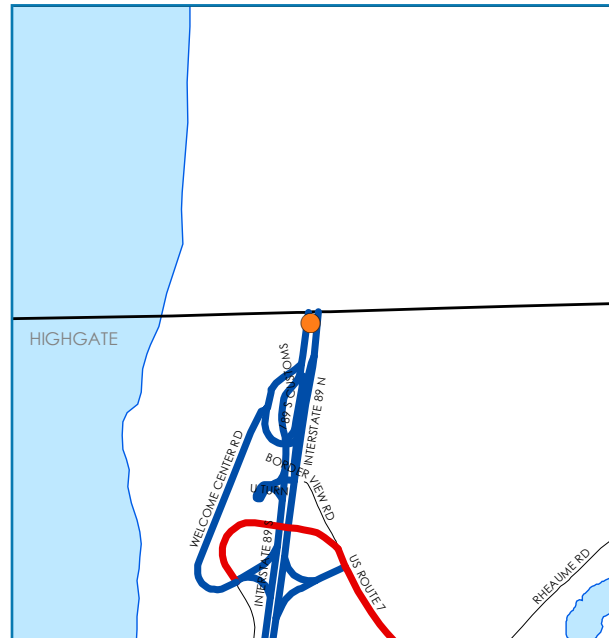
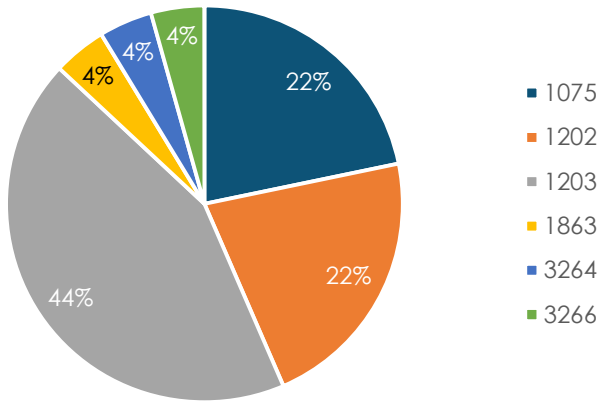
Website: <http://www.nrpcvt.com/EmergencyPlanning.html>

Northwest RPC

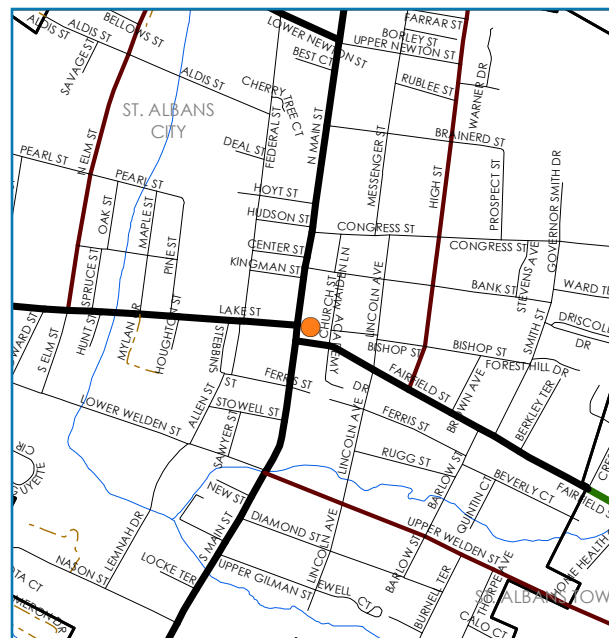
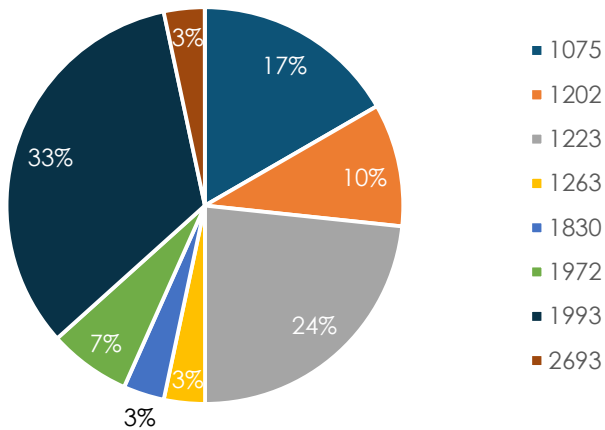
75 Fairfield Street

St. Albans, VT .5478

Highgate Border Crossing - I-89 South



Saint Albans - US 7 North/South



LEPC #4

Derby Border Crossing ~ Sample				
Date: 10/4/2016		Time: 800 - Noon		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		

Derby Border Crossing ~ Sample				
Date: 11/19/2016		7:00 - 11:00 a.m.		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		

Saint Albans City US Route 7				
Date: 6/9/2017			8:00 AM - Noon	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:03 AM	1993	North	Home Delivery	Fuel Oil
8:18 AM	1223	South	Home Delivery	Kerosene
8:51 AM	1993	South	Home Delivery	Fuel Oil
9:08 AM	1993	South	Home Delivery	Fuel Oil
9:17 AM	1830	South	Tractor Trailer	Sulfuric Acid. No labels only placard
10:06 AM	1993	North	Home Delivery	Fuel Oil
10:40 AM	1993	North	Home Delivery	Fuel Oil
11:11 AM	1202	North	Large Tanker	Fuel Oil
11:48 AM	1993	North	Home Delivery	Fuel Oil
11:57 AM	1263	North	Medium Delivery Truck	Paint materials

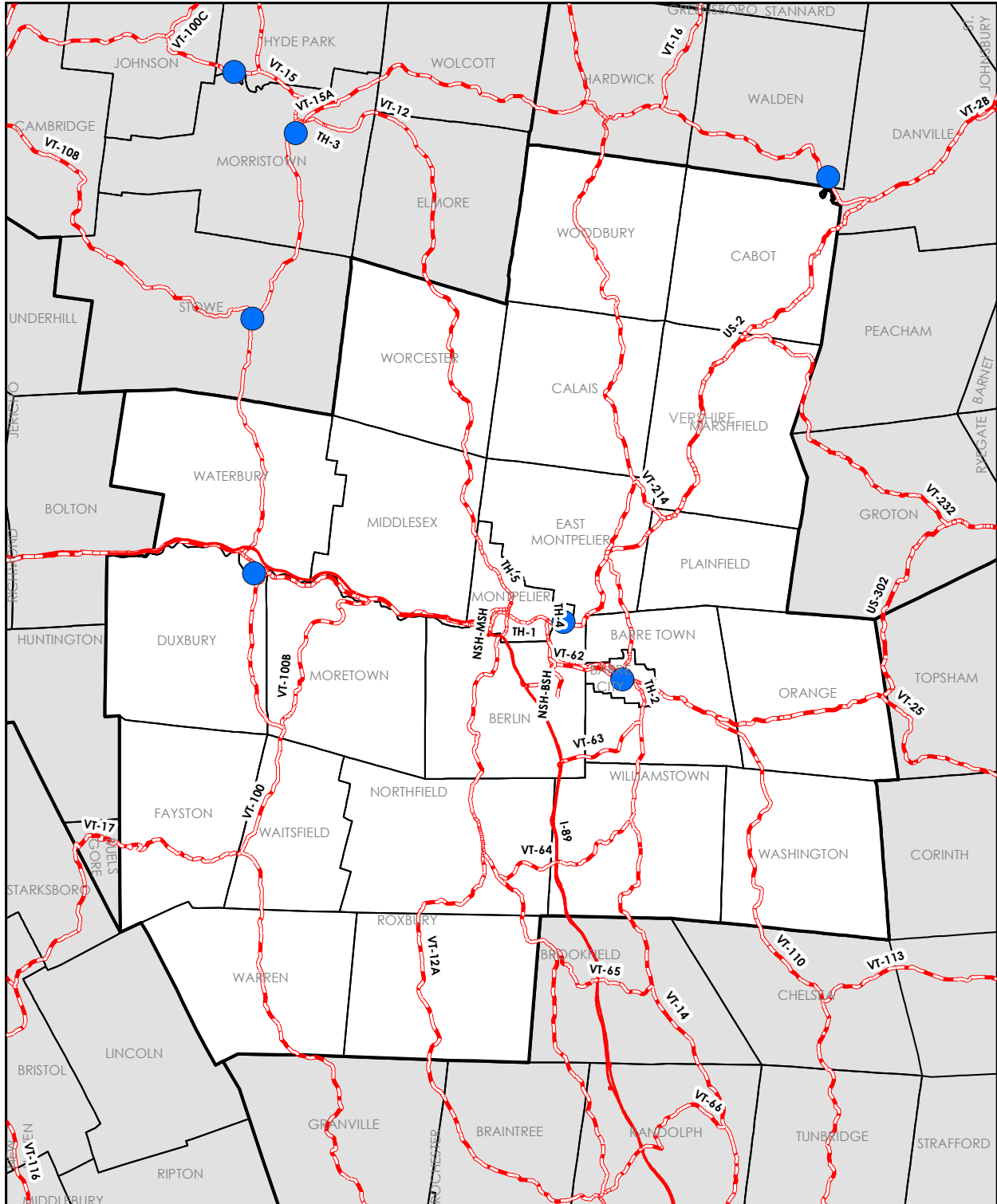
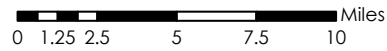
Saint Albans City US Route 7				
Date: 6/16/2017			8:00 AM - Noon	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
8:08 AM	1202	North	Large Tanker	Heating Oil
8:36 AM	1972	South	Medium Tanker	Methane, refrigerated Liquid or natural gas. No truck labels. Only placard
8:40 AM	1223	South	Home Delivery	Kerosene
9:11 AM	1993	South	Home Delivery	Fuel Oil
9:27 AM	1223	South	Home Delivery	Kerosene
10:15 AM	1075	North	Home Delivery	Propane
10:37 AM	2693	North	Tractor Trailer	Bisulfite, aqueous solution
10:39 AM	1223	North	Home Delivery	Kerosene
10:44 AM	1993	North	Home Delivery	Fuel Oil
11:01 AM	1075	North	Small utility	Propane
11:35 AM	1075	North	small utility	Propane

Saint Albans City US Route 7				
Date: 6/23/2017			8:00 AM to Noon	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:36 AM	1972	South	Medium Tanker	Methane, refrigerated liquid (cryogenic liquid) or Natural gas, refrigerated liquid (cryogenic liquid), with high methane content
8:51 AM	1223	South	Home Delivery	Propane
9:04 AM	1075	South	Utility	Butane, propane, liquified petroleum gas and similar
9:36 AM	1993	South	Home Delivery	Fuel Oil
10:13 AM	1075	North	anker (~3,000 gallon)	Butane, propane, liquified petroleum gas and similar
10:37 AM	1202	North	Large Tanker	diesel fuel, fuel oil, gas oil, heating oil
10:56 AM	1223	North	Medium Tanker	Propane
11:35 AM	1993	South	Home Delivery	Fuel Oil
11:50 AM	1223	South	Home Delivery	Propane

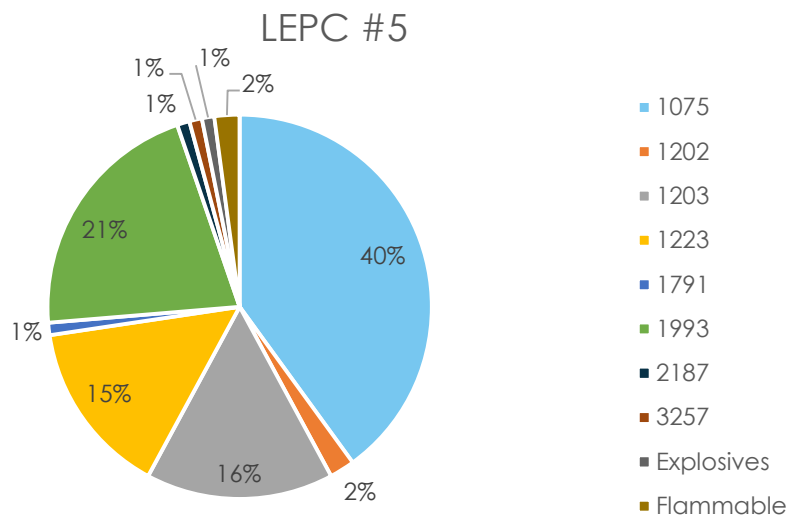
HMEP Locations

LEPC # 5

 Study Areas



LEPC #5



Chair: Katina Johnson

RPC: Central Vermont Regional Planning Commission

Phone: (802) 4479-0509

Website: <https://www.facebook.com/VtLocalEmergencyPlanningCommittee5/>

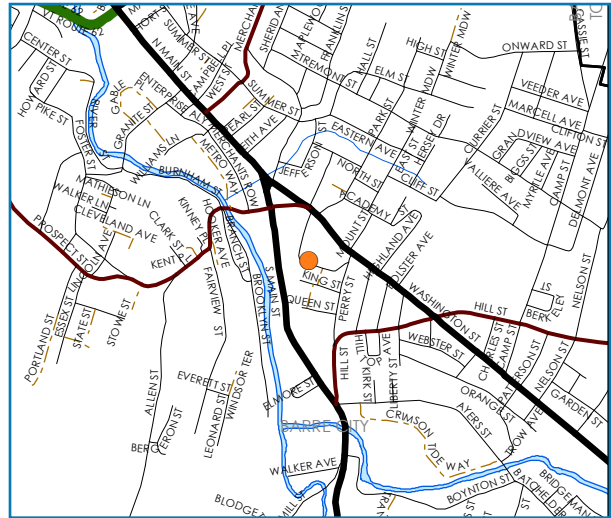
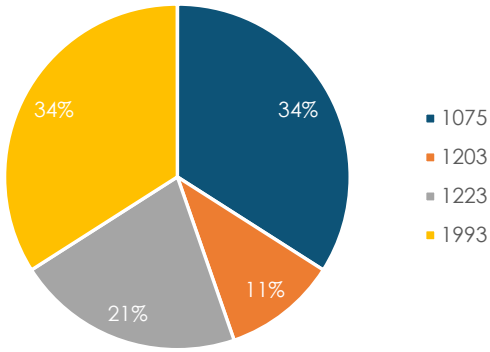
LEPC#5

Barre City Hall

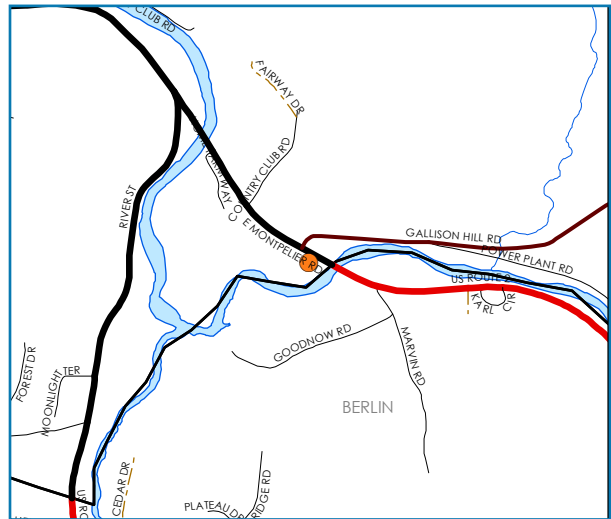
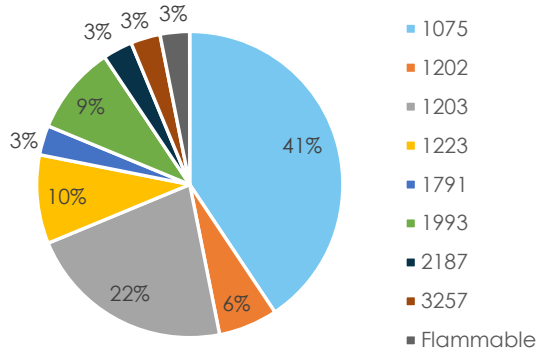
6 North Main Street

Barre, VT 05641

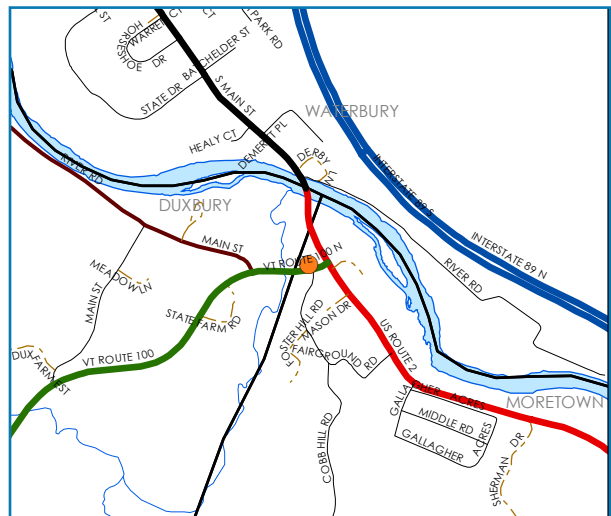
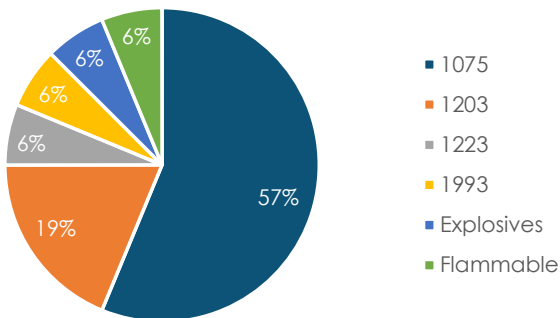
Barre - US 302
East/West



Montpelier - US 2
East/West



Waterbury - VT Route 100
North/South



LEPC #5

Barre US Route 2				
Date: 3/20/17		8:15-12:15		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:16 AM	1075	West	Propane Truck	6 Wheel/ 2 axle
8:19 AM	1203	East	Fuel Truck	18 Wheel/ 5 axle
8:26 AM	1075	West	Propane Truck	18 Wheel/ 5 axle
8:33 AM	1075	West	Propane Truck	6 Wheel/ 2 axle
8:35 AM	1993	West	Fuel Truck	6 Wheel/ 2 axle
8:36 AM	1223	East	Oil Truck	6 Wheel/ 2 axle
8:37 AM	1993	East	Oil Truck	6 Wheel/ 2 axle
8:54 AM	1075	East	Small Propane Utility Truck	4 Wheel/ 2 axle
9:18 AM	1075	West	Oil Truck	6 Wheel/ 2 axle
9:22 AM	1223	West	Fuel Truck	6 Wheel/ 2 axle
9:48 AM	1203	West	Fuel Truck	18 Wheel/ 5 axle
9:56 AM	1075	East	Oil Truck	6 Wheel/ 2 axle
10:00 AM	1993	East	Oil Truck	
10:33 AM	1993	East	Oil Truck	6 Wheel/ 2 axle
10:39 AM	1223	East	Fuel Truck	18 Wheel/ 5 axle
10:55 AM	1993	East	Oil Truck	6 Wheel/ 2 axle
11:10 AM	1993	East	Oil Truck	6 Wheel/ 2 axle
11:24 AM	1075	West	Small Propane Utility Truck	4 Wheel/ 2 axle
11:33 AM	1993	East	Oil Truck	6 Wheel/ 2 axle
11:49 AM	1223	West	Propane Truck	6 Wheel/ 2 axle
12:09 PM	1993	West	Oil Truck	6 Wheel/ 2 axle

Barre US Route 2				
Date: 5/3/17			7:30 AM - 11:30 AM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
7:55 AM	1075	West	Propane	6 Wheel/ 2 axle
8:05 AM	1075	West	Propane	6 Wheel/ 2 axle
8:06 AM	1203	West	Gasoline	22 Wheel/ 6 axle
8:16 AM	1075	East	Propane	18 Wheel/ 5 axle
8:29 AM	1993	East	Oil	22 Wheel/ 6 axle
9:27 AM	1993	West	Oil	6 Wheel/ 2 axle
9:29 AM	1993	East	Oil	6 Wheel/ 2 axle
9:42 AM	1993	West	Oil	6 Wheel/ 2 axle
10:49 AM	1993	West	Oil	6 Wheel/ 2 axle
10:58 AM	1203	East	Oil	18 Wheel/ 5 axle
11:06 AM	1223	East	Propane	6 Wheel/ 2 axle
11:13 AM	1993	East	Oil	6 Wheel/ 2 axle
11:13 AM	1223	West	Oil	6 Wheel/ 2 axle

LEPC #5

Barre US Route 2				
Date: 6/16/17			7:30 AM - 11:30 AM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
7:41 AM	1075	West	Propane	6 Wheel/ 2 axle
7:51 AM	1223	West	Oil	6 Wheel/ 2 axle
8:07 AM	1075	West	Propane	6 Wheel/ 2 axle
8:28 AM	1223	West		22 Wheel/ 6 axle
9:24 AM	1075	East	Propane	6 Wheel/ 2 axle
9:57 AM	1223	West	Oil	6 Wheel/ 2 axle
9:59 AM	1993	East		6 Wheel/ 2 axle
10:02 AM	1203	East	Oil	22 Wheel/ 6 axle
10:17 AM	1223	West	Oil	6 Wheel/ 2 axle
10:20 AM	1075	East	Propane	22 Wheel/ 6 axle
10:24 AM	1075	West	Propane	6 Wheel/ 2 axle
10:33 AM	1075	East	Propane	22 Wheel/ 6 axle
10:48 AM	1993	West		18 Wheel/ 5 axle

Montpelier US Route 2				
Date: 3/20/17			12:30 PM - 4:30 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
1:01 PM	1075	West	Oil Truck	6 Wheel/ 2 axle
1:04 PM	1223	East	Propane Truck	6 Wheel/ 2 axle
1:10 PM	1203	West	Fuel Truck	18 Wheel/ 2 axle
1:13 PM	2187	West		6 Wheel/ 2 axle
1:14 PM	1075	East	Oil Truck	10 Wheel / 3 axle
1:15 PM	1075	West	Oil Truck	18 Wheel/ 2 axle
1:54 PM	1203	East	Fuel Truck	18 Wheel/ 2 axle
2:28 PM	1203	East	Fuel Truck	18 Wheel/ 2 axle
2:28 PM	1993	East	Small Propane Truck	6 Wheel/ 2 axle
2:43 PM	1223	East	Small Propane Truck	6 Wheel/ 2 axle
3:19 PM	1075	East	Propane Truck	6 Wheel/ 2 axle
3:32 PM	1202	East		22 Wheel/ 6 axle
4:15 PM	1993	East	Small propane Truck	6 Wheel/ 2 axle

LEPC #5

Montpelier US Route 2				
Date: 5/3/17			11:45 AM - 3:45 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:35 PM	Flamable Gas 3	East	Box Truck	
1:16 PM	1075	West	Propane	6 Wheel/ 2 axle
1:46 PM	1075	East	Propane	6 Wheel/ 2 axle
2:05 PM	1203	East	Oil	18 Wheel/ 2 axle
2:18 PM	1075	East	Propane Utility Truck	6 Wheel/ 2 axle
2:26 PM	1203	East	Oil	22 Wheel / 2 axle
2:28 PM	1075	West	Propane	6 Wheel/ 2 axle
3:12 PM	1075	West	Propane	6 Wheel/ 2 axle

Montpelier US Route 2				
Date: 6/16/17			11:30 AM - 3:30 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
11:41 AM	1993	West		6 Wheel/ 2 axle
12:00 PM	1203	West	Oil	22 Wheel/ 6 axle
12:43 PM	1791	West		Box Truck
12:43 PM	1075	East	Pro	6 Wheel/ 2 axle
12:43 PM	1223	West		22 Wheel/ 6 axle
12:46 PM	3257	East		22 Wheel/ 6 axle
12:58 PM	1075	West	Propane	Utility Truck
1:24 PM	1202	East		18 Wheel/ 5 axle
1:29 PM	1075	East	Propane	18 Wheel/ 5 axle
2:08 PM	1203	East	Oil	22 Wheel/ 6 axle
2:09 PM	1075	West	Propane	6 Wheel/ 2 axle

Waterbury VT Route 100				
Date: 4/7/17		7:45 AM- 11:45 AM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:07 AM	1993	North	Gas truck	6 Wheel/ 2 axle
8:30 AM	1203	South	Gas truck	22 Wheel/ 2 axle
9:39 AM	1075	South	Utility Truck	6 Wheel/ 2 axle
9:45 AM	1075	North	Utility Truck	6 Wheel/ 2 axle
9:54 AM	1203	North	Propane	22 Wheel/ 2 axle
11:16 AM	1075	North	Propane	18 Wheel/ 5 axle
11:34 AM	Flamable Gas 2: Green Sign Flamable Gas 2: Red Sign	South	Specialty Gas Box Truck	10 Wheel/ 3 axle
11:42 AM	1075	South	Propane	6 Wheel/ 2 axle

Waterbury VT Route 100				
Date: 5/5/17		11:45 AM- 3:45 AM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:22 PM	1075	North	Propane	6 Wheel/ 2axle
12:34 PM	1075	North	Propane	6 Wheel/ 2axle
1:24 PM	1223	South	Oil	6 Wheel/ 2axle

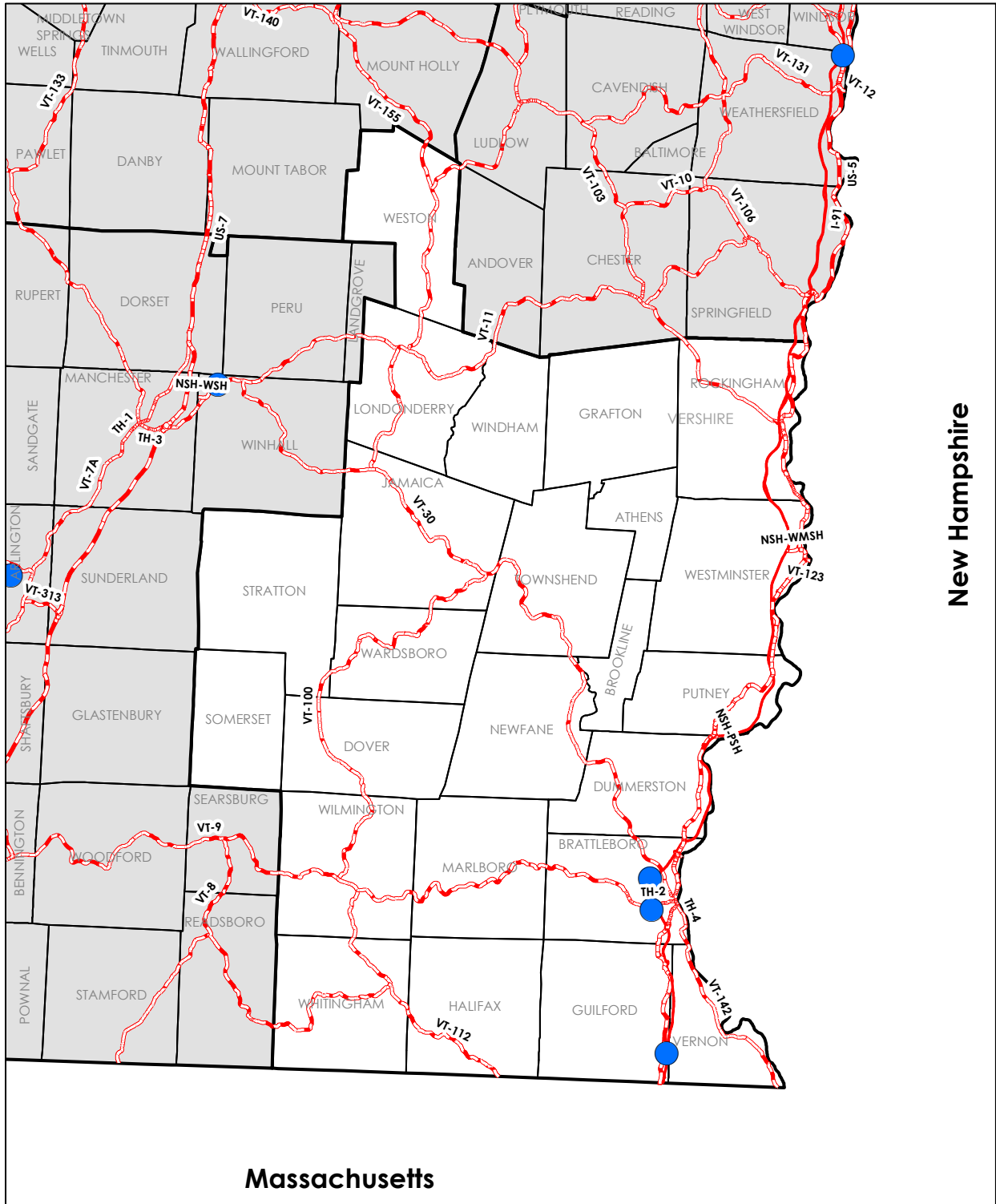
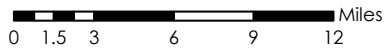
Waterbury VT Route 100				
Date: 6/9/17		12:45 PM- 4:15 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
1:22 PM	1075	South	Propane	6 Wheel/ 2axle
1:40 PM	1075	South	Propane	6 Wheel/ 2axle
1:57 PM	Explosives 1.1 D Orange Sign	North		Pick Up Truck
2:10 PM	1203	North	Oil	22 Wheel/ 6 axle
2:19 PM	1075	North	Propane	6 Wheel/ 2axle

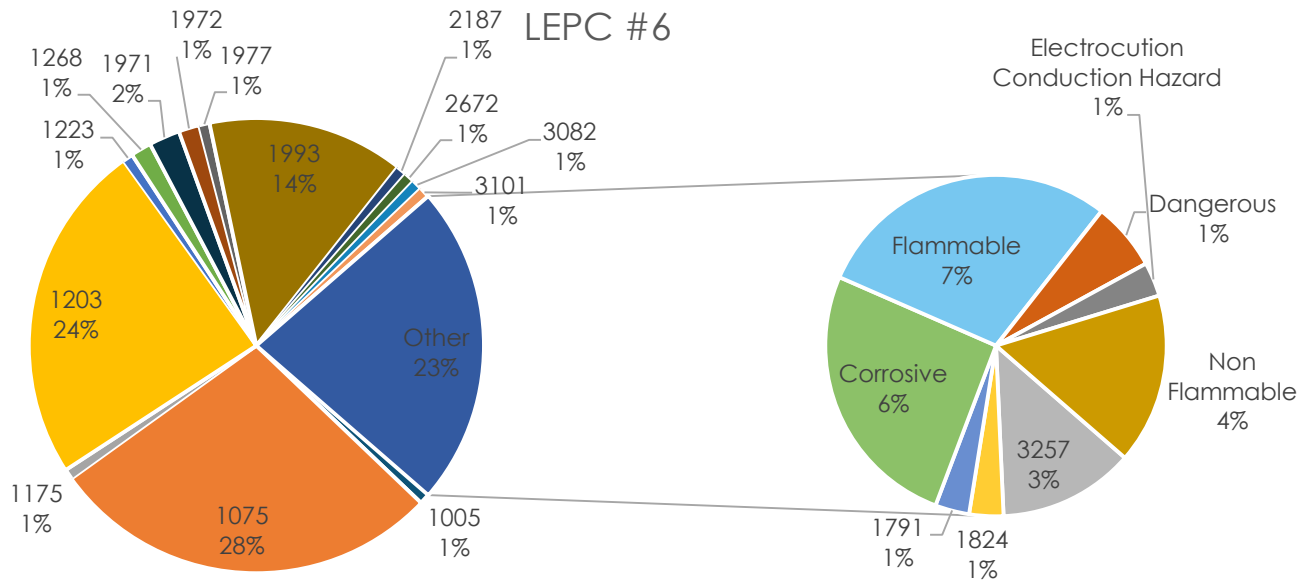
LEPC #6

HMEP Locations

LEPC # 6

 Study Areas





Chair: Paul Fraser

RPC: Windham Regional Commission

Phone: (802) 257-4547

Website: <http://windhamregional.org/lepc-6>

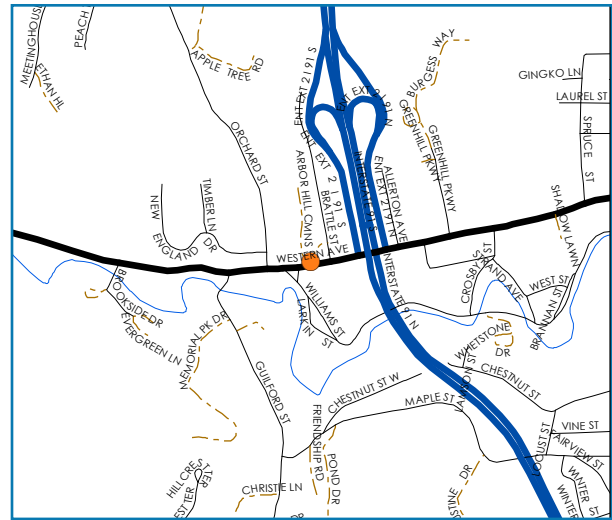
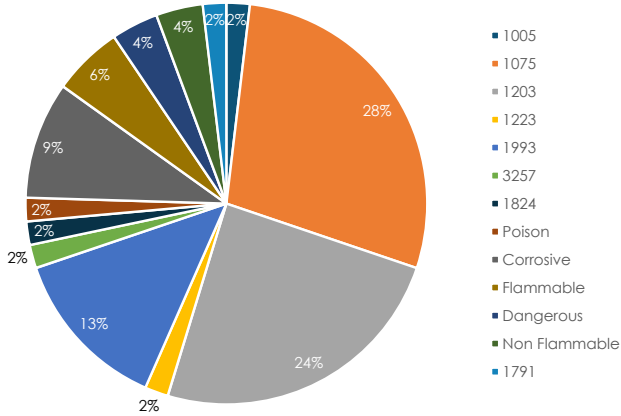
LEPC#6 c/o WRC

139 Main Street, Suite 505

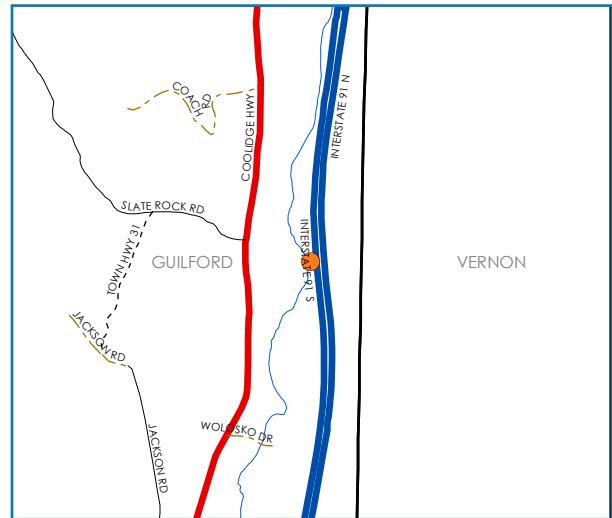
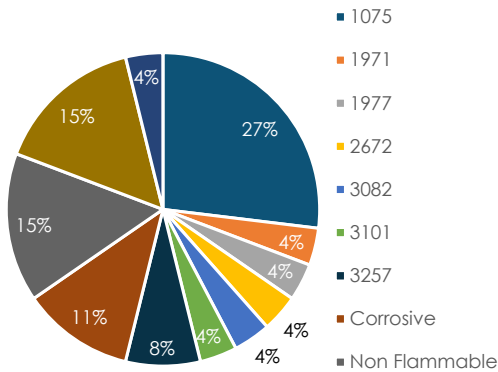
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LEPC #6

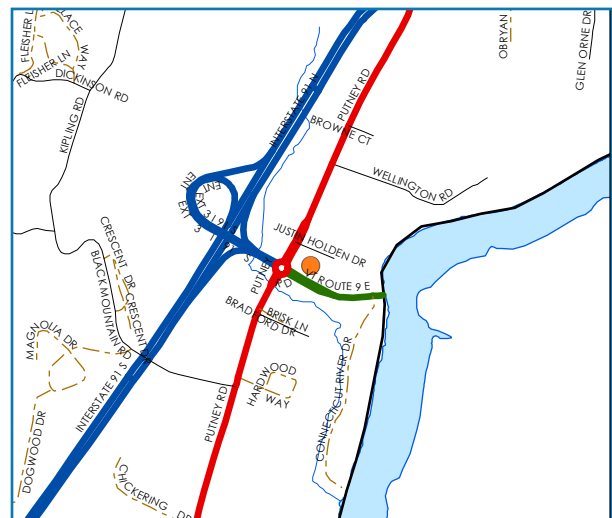
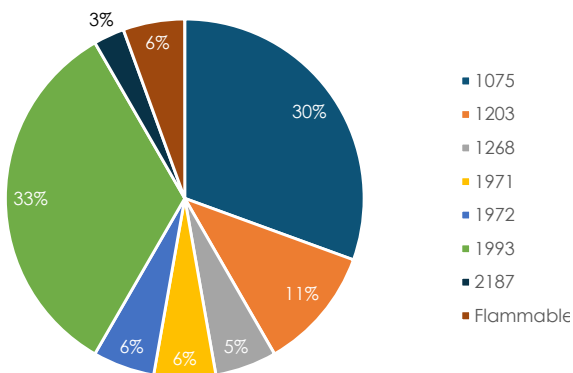
Brattleboro - VT Route 9 East/West



Guilford - I-91 North



Brattleboro - US 5 North/South



Brattleboro VT Route 9				
Date: 6/7/2017			11:00 AM - 3:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
11:09	Corrosive(8)	EB	Box Trailer	White Trailer
11:23	Flamable(1075-2)	WB	Trailer w/ tanks	Suburban Propane
11:27	Flamable(1203-3)	EB	Tanker	Sunoco
12:04	Dangerous	EB	Trailer	
12:23	Hot(3257)	WB	Tanker	Gas
12:36	Corrosive(8) / Falmable(3)	WB	Box Trailer	
12:43	Corrosive(8) / Falmable(3)	EB	Box Trailer	Same truck as at 12:36
12:51	Flamable(1075-2)	WB	Box Trailer	White Trailer
12:55	Flamable(1993-3)	WB	Tanker	Dead River Company
1:09	Flamable(1075-2)	WB	Tanker	L&G Propane
1:24	Flamable(1075-2)	EB	Tanker	L&G Propane
1:44	Flamable(1075-2)	WB	Tanker	Keene Gas
2:20	Flamable(1203-3)	EB	Tanker	Only placard on rear of truck
2:47	Flamable(1203-3)	EB	Tanker	Sunoco

LEPC #6

Brattleboro VT Route 9				
Date: 6/14/2017			1:10 PM - 5:10 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
1:11 PM	Flamable(1203-3)	WB	Tanker	Barrows and Fisher
1:48 PM	Flamable(1075-2)	WB	Tanker	Sandri Propane
1:56 PM	Flamable(1075-2)	EB	Tanker	Sandri Propane (Same truck as previous)
2:12 PM	Flamable(1203-3)	EB	Tanker	P&H Transportation
2:19 PM	Flamable(1993-3)	WB	Tanker	Dead River Company
2:26 PM	Flamable(1993-3)	EB	Tanker	Dead River Company (Same truck as previous)
2:30 PM	Flamable(1203-3)	EB	Tanker	Sandri Propane
2:57 PM	Flamable(1203-3)	EB	Tanker	Barrows and Fisher
3:13 PM	Ammonia(1005-2)	EB	Tanker	Airgas Compnay
3:31 PM	Flamable(2) / Non-flamable(2)	WB	Trailer w/ tanks	Airgas Compnay
4:12 PM	Corrosive(8)	WB	Box Trailer	Landstar
4:39 PM	Flamable(1075-2)	EB	Tanker	Suburban Propane
4:48 PM	Flamable(1075-2)	EB	Trailer w/ tanks	

Brattleboro VT Route 9				
Date: 6/21/2017			8:10 AM - 12:20 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:22 AM	Flamable(1203-3)	WB	Tank	Sunoco
8:22 AM	Flamable(1203-3)	EB	Tank	JP Noonan
8:50 AM	Flamable(1203-3)	EB	Tank	P&H Transportation
9:32 AM	Flamable(1223-3)	WB	Tank	Rice Company
9:37 AM	Corrosive(1824-8) / Corrosive (1791-8)	EB	Tank	One placard on front, two on back
9:50 AM	Flamable(1993-3)	WB	Tank	Barrows & Fisher
10:00 AM	Flamable(1075-2)	WB	Tank	James Oil
10:12 AM	Flamable(1075-2)	EB	Tank	James Oil
10:15 AM	Flamable(1203-3)	EB	Tank	Jewett and Noonan
10:31 AM	Flamable(1203-3)	WB	Tank	P&H Transportation
10:41 AM	Flamable(1075-2)	WB	Tank	Suburban Propane
10:56 AM	Flamable(1993-3)	EB	Tank	Barrows & Fisher
10:58 AM	Corrosive (8) Poison	EB	Trailer	Triumvirate Environmental
11:05 AM	Flamable(1203-3)	WB	Tank	Sandri Sunoco
11:12 AM	Flamable(1993-3)	WB	Tank	Dead River
11:29 AM	Flamable(1075-2)	WB	Tank	P.T.I
11:33 AM	Flamable(1075-2)	WB	Tank	L&G Propane
11:44 AM	Flamable(1075-2)	EB	Tank	L&G Propane
11:44 AM	Flamable(1993-3)	EB	Tank	Dead River
11:57 AM	Dangerous (Red placard)	WB	Trailer	No placard number

LEPC #6

Guilford Weigh Station I-91 North				
Date: 5/3/17		9:00 AM - 1:00 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:17 AM	1075(2)	North	Tanker	Propane
9:30 AM	1075(2)	North	Tanker	Propane
9:39 AM	3082(9)	North	12 Wheel Tanker	
10:03 AM	2672(2)	North	Tanker	
11:16 AM	Non Flamable Gas (2)	North	Tanker	
11:47 AM	5.2(2)	North	Box Truck	Organic Peroxide
12:00 PM	1977(2)	North	Tanker	Liquid Nitrogen
12:11 PM	Corrosive (8)	North	Tanker	
12:44 PM	HOT 3257	North	Tanker	

Guilford Weigh Station I-91 North				
Date: 6/1/2017		9:00 AM - 1:00 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
9:03 AM	Flamable(3)	North	Box	ME License
9:08 AM	Flamable(1075)	North	Box	AmeriGas
9:16 AM	Electrocution Conduction Hazard	North	Trailer	Crane
9:38 AM	Flamable(2) / Non-Flamable(2)	North	Tanker	ME License
10:00 AM	Flamable(1075)	North	Tanker	VT License
10:09 AM	Corrosive(8)	North	Box	
11:11 AM	Flamable(2) / Non-Flamable(2)	North	Trailer	VA License / Propane Tanks
11:16 AM	HOT(3257-9)	North	Tanker	NY License
11:46 AM	Flamable(1075-2)	North	Tanker	NY License
11:54 AM	Flamable(2) / Non-Flamable(2)	North	Box	

Guilford Weigh Station I-91 North				
Date: 7/19/2017		Noon - 4:00 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
1:41 PM	1075(2) Flame	North	Tanker	LP Propane
1:55 PM	Corrosive 8	North	Trailer	I.B.A
2:57 PM	1971 (2)	North	Trailer	XNG
3:25 PM	1075(2) Flame	North	Tanker	E. Osterman

LEPC #6

Brattleboro US Route 5				
Date: 6/20/2017			9:00 AM - 1:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:03 AM	Flamable(1993-3)	NB	Tanker	Barrows and Fisher
9:15 AM	Flamable(1075-2)	SB	Tanker	Suburban Propane
9:24 AM	Flamable(1993-3)	SB	Tanker	Barrows and Fisher
9:59 AM	Flamable(1268-3)	NB	Box Trailer	Plain white trailer
10:14 AM	Flamable(1075-2)	NB	Tanker	Keene Gas
10:28 AM	Flamable(1268-3) / Flamable(1993-3) / Flamable(3)	SB	Box Trailer	Plain white trailer
11:49 AM	Flamable(1075-2)	NB	Box Trailer	Plain white trailer
12:08 PM	Non-flamable(2187-2)	NB	Tanker	NuCO2
12:34 PM	Flamable(1075-2)	SB	Box Trailer	Plain white trailer
12:56 PM	Flamable(3)	SB	Box Trailer	Land Air Express (placard only on rear of trailer)

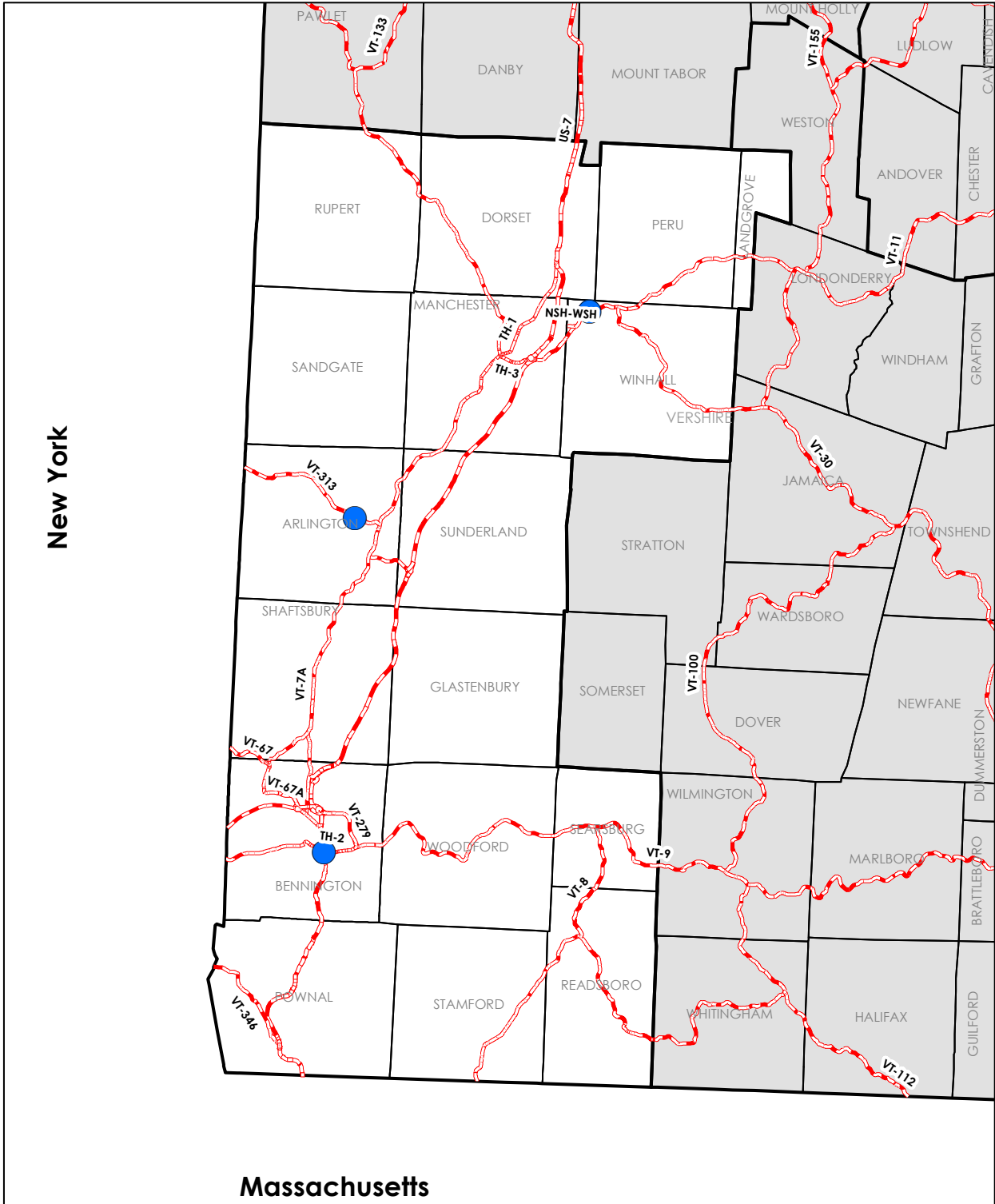
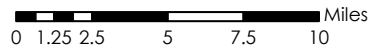
Brattleboro US Route 5				
Date: 6/21/2017			1:00 PM - 5:00 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
2:34 PM	Flamable(1972-2)	NB	Tank	LP Transportation (Methane, liquid)
2:58 PM	Flamable(1075-2)	SB	White Box	Jet Gas (mighty flame)
3:06 PM	Flamable(1993-3)	SB	Tank	Barrows & Fisher
3:15 PM	Flamable(1075-2)	NB	Tank	Suburban Propane
3:19 PM	Flamable(1993-3)	NB	Tank	Discount Oil of Keene
3:36 PM	Flamable(1972-2)	SB	Tank	LP Transportation (Methane, liquid)
3:41 PM	Flamable(1075-2)	SB	Tank	Suburban Propane
3:42 PM	Flamable(1993-3)	SB	Tank	Discount Oil of Keene
4:23 PM	Flamable(1075-2)	NB	Tank	Suburban Propane
4:23 PM	Flamable(1075-2)	SB	Tank	Keene Gas
4:44 PM	Flamable(1075-2)	NB	Tank	Suburban Propane

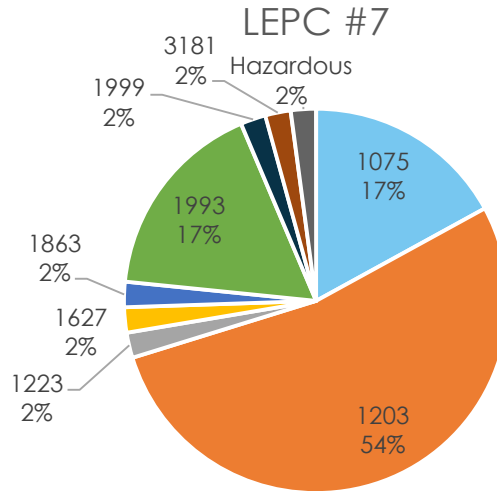
Brattleboro US Route 5				
Date: 6/28/2017			11:00 AM - 3:00 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
11:00 AM	Flamable(1993-2)	SB	Tank	Jewett & Noonan
11:09 AM	Flamable(1203-3)	NB	Tank	Robert's Energy Springfield
11:10 AM	Flamable(1203-3)	NB	Tank	Barrows & Fisher
11:22 AM	Flamable(1971-2)	NB	Box	General Transportation (natural gas compressed)
11:24 AM	Flamable(1993-3)	NB	Tank	Barrows & Fisher
11:30 AM	Flamable(1993-3)	SB	Tank	Discount Oil of Keene
11:48 AM	Flamable(1971-2)	SB	Box	General Transportation (natural gas compressed)
11:54 AM	Flamable(1203-3)	SB	Tank	Robert's Energy Springfield
12:00 PM	Flamable(1993-3)	SB	Tank	Barrows & Fisher
12:55 PM	Flamable(1203-3)	SB	Tank	Barrows & Fisher
2:29 PM	Flamable(1993-3)	NB	Tank	Barrows & Fisher
2:43 PM	Flamable(1993-3)	SB	Tank	Barrows & Fisher
2:45 PM	Flamable(1075-2)	SB	Service Trailer w/ tank	Rymes Propane & Oil

LEPC #7

HMEP Locations

LEPC # 7  Study Areas





Chair: Keith Squires

RPC: Bennington County Regional Commission

Phone: (802) 442-0713 ext. 2

Website: http://www.rpc.bennington.vt.us/Programs/Emergency_Management/#LEPC

LEPC#7 c/o BCRC

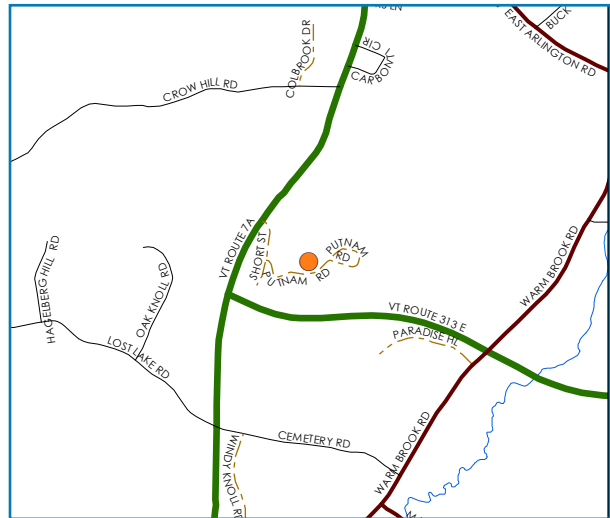
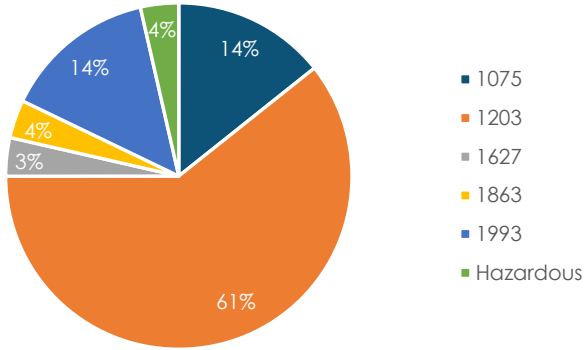
ATTN: Allison Langsdale

111 South Street, Suite 203

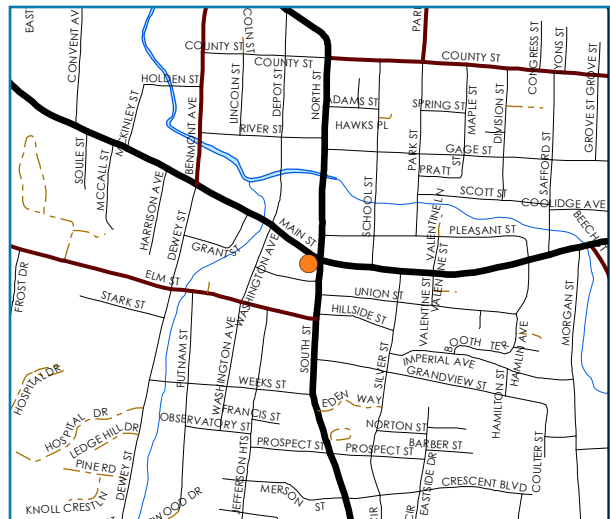
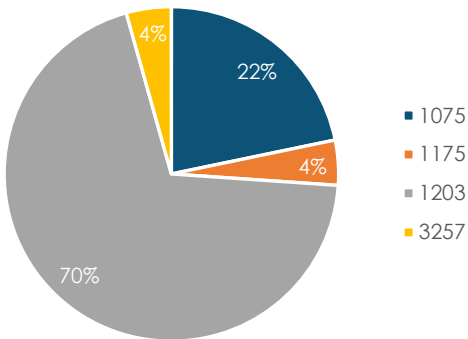
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LEPC #7

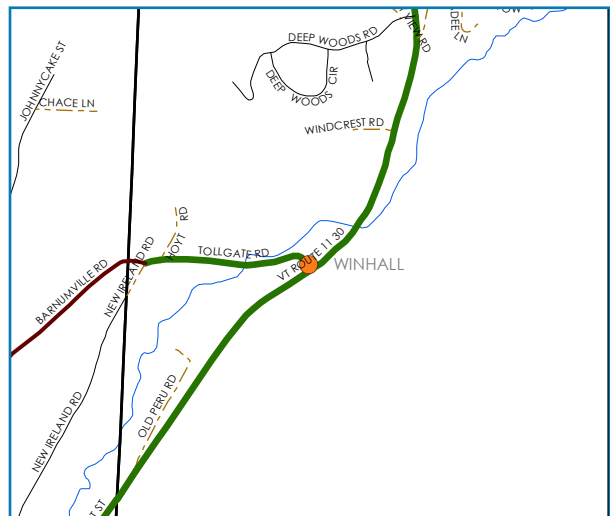
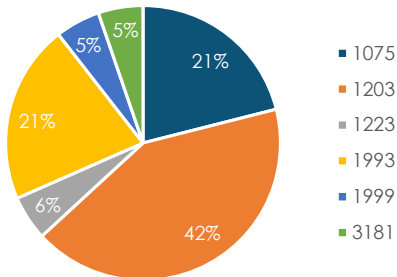
Arlington - VT 7A East



Bennington - VT Route 9 East/West



Manchester - VT Route 30 North/South



Arlington US Route 7				
Date: 5/31/2017			9:30 AM - 2:15 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:48am	1993	South		
10:26am	1993	South		
10:46am	1627	South		
10:51am	Hazardous	North		Unmarked, but "HAZARDOUS" labeled on side of truck
10:53am	1993	North		
1:00pm	1993	North		
1:21pm	1863	North		

Arlington US Route 7				
Date: 6/8/2017			10:30 AM - 3:00 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
10:40am	1203	South		
10:50am	1203	South		
11:05am	1203	North		
11:13am	1203	North		
11:42am	1203	North		
1:10pm	1203	North		
1:13pm	1203	South		
1:15pm	1203	North		
1:24pm	1075	North		
1:32pm	1203	North		
1:59pm	1203	North		
2:31pm	1203	South		
2:52pm	1075	South		

LEPC #7

Arlington US Route 7				
Date: 6/16/2017			Time	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
11:37am	1203	South		
11:43am	1203	South		
11:48am	1203	South		
12:06pm	1203	South		
12:53pm	1075	North		
1:02pm	1203	South		
1:57pm	1075	South		
2:30pm	1203	North		

Bennington VT Route 9				
Date: 6/2/2017			9:30 AM - 2:15 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:37am	1075	East		
9:55am	1203	East		
10:21am	1203	East		
11:07am	3257	East		
12:30pm	1075	West		
12:38pm	1203	East		
12:41pm	1203	East		
12:42pm	1203	West		
1:00pm	1203	East		
1:46pm	1203	East		

Bennington VT Route 9				
Date: 6/6/2017		10:20 AM - 3:15 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
11:08am	1203	East		
11:56am	1203	East		
1:18pm	1203	East		
1:20pm	1075	West		
2:11pm	1203	West		

Bennington VT Route 9				
Date: 6/14/2017		8:30 AM - 12:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:39am	1203	East		
8:59am	1203	West		
9:08am	1203	East		
9:15am	1075	East		
9:17am	1175	West		
9:43am	1203	West		
11:51am	1203	East		
12:09pm	1075	East		

Winhall VT Route 30				
Date: 6/1/2017		9:50 AM - 1:50 AM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
10:20am	1203	North		
10:45am	1993	North		
11:03am	1203	North		
12:06pm	1999	South		
1:30pm	3181	North		
1:46pm	1203	South		

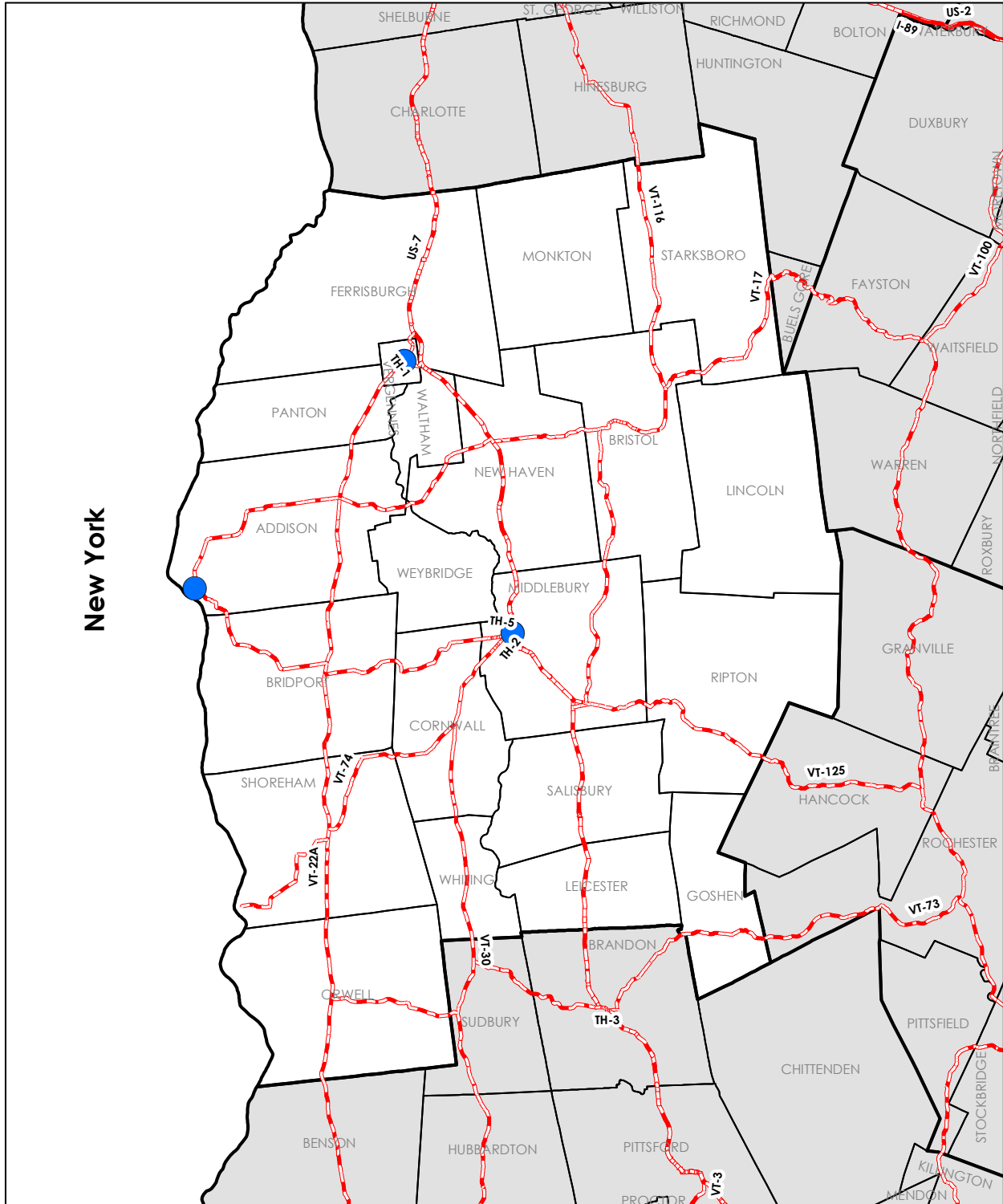
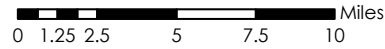
Winhall VT Route 30				
Date: 6/7/2017		11:00 AM - 3:00 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
11:04am	1223	North		
11:11am	1203	South		
11:13am	1075	South		
11:20am	1203	North		
12:46pm	1993	North		
1:38pm	1203	South		
2:12pm	1075	North		

Winhall VT Route 30				
Date: 6/19/2017		12:00 PM - 4:00 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:31pm	1075	North		
12:45pm	1203	South		
12:47pm	1993	South		
1:10pm	1203	South		
2:24pm	1075	North		
2:39pm	1993	North		

HMEP Locations

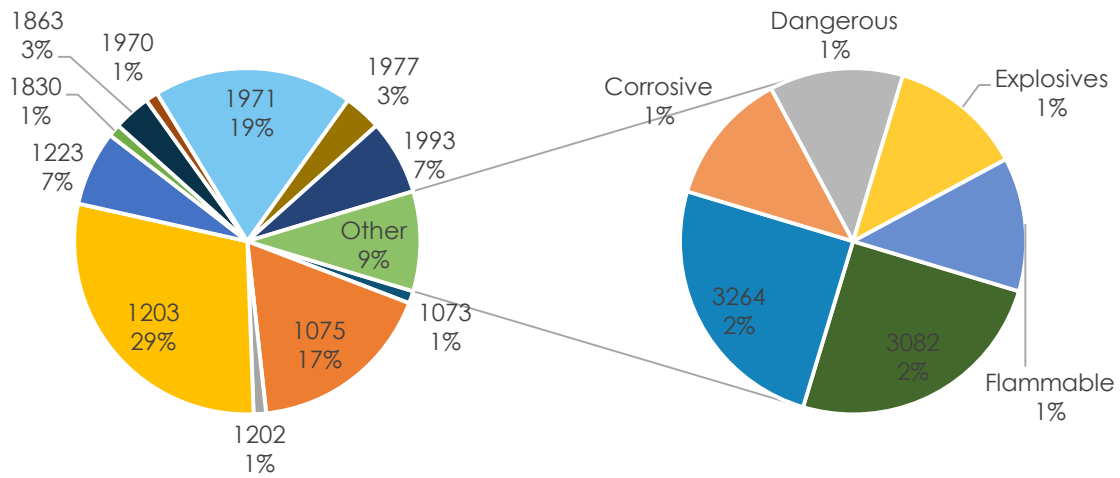
LEPC # 8

● Study Areas



LEPC #8

LEPC #8



Chair: Matthew Fraley

RPC: Addison County Regional Planning Commission

Phone: (802) 877-4121

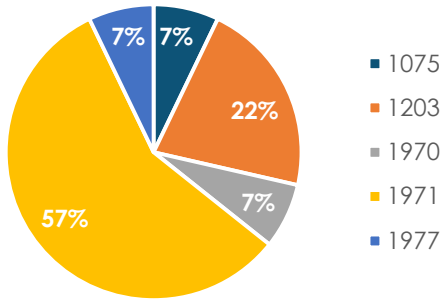
Website: <http://aclepc.org/>

Addison County LEPC #8

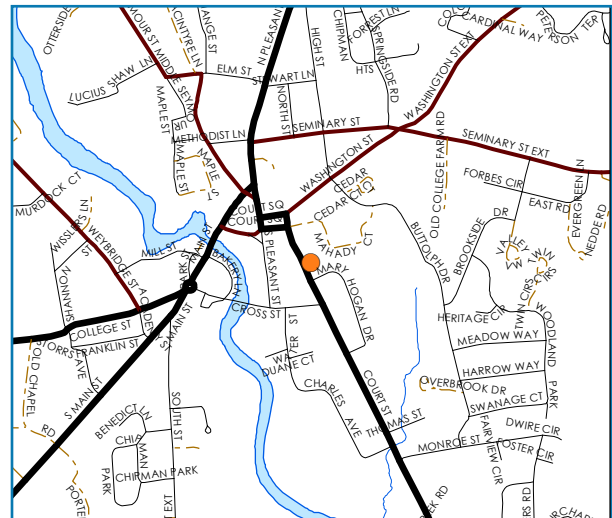
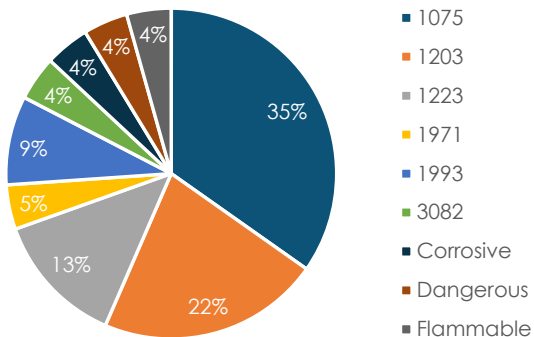
PO Box 282

Vergennes, VT 04091

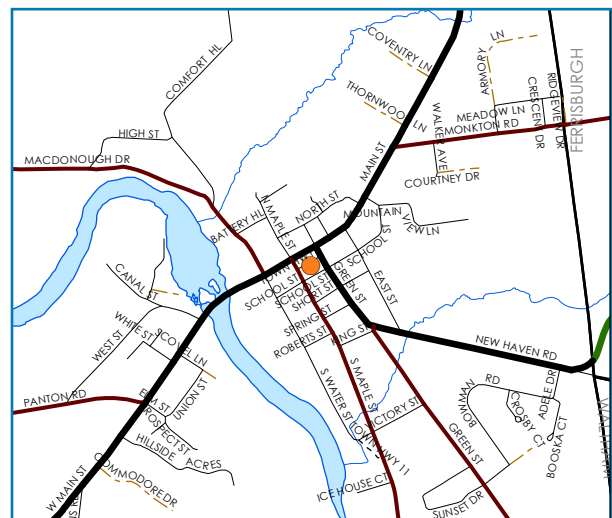
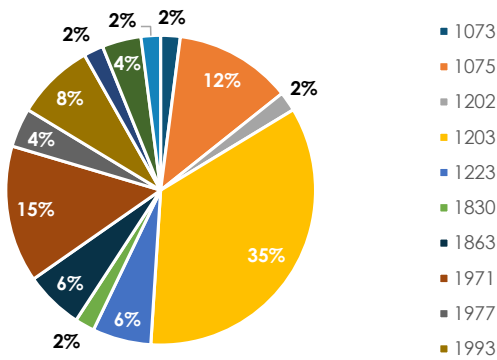
Addison - VT Route 17
East/West



Middlebury - RT 7
North/South



Vergennes - US 7
North/South



LEPC #8

Addison VT Route 17				
Date: 12/15/2016			12:14 PM - 4:14 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
1:19 AM	1971	west on rt 17	tt	
2:54 AM	1971	west on rt 17	tt	
2:55 AM	1075	west on rt 17	work truck	
3:25 AM	1203	west on rt 17	tt	
3:27 AM	1970	west on rt 17	tt	

Addison VT Route 17				
Date: 4/18/2017			1:10 PM - 5:10 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
4:50 AM	1203	south onto 125	tt	

Addison VT Route 17				
Date: 7/5/17			1:00 PM - 5:00 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
1:19 PM	1971	west	tt	
1:46 PM	1971	west	tt	
2:25 PM	1971	east	tt	
2:22 PM	1971	west	tt	
2:48 PM	1977	west	tt	
3:14 PM	1971	east	tt	
3:31 PM	1971	east	tt	
3:51 PM	1203	west	tt	

Middlebury US Route 7				
Date: 4/10/2017			10:30 AM - 2:30 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
11:25 AM	1993	North	propane	
11:26 AM	flammable	South	propane	
12:59 PM	1971	North	tt	
1:13 PM	1075	South	propane	
1:20 PM	3082	North	propane	
1:22 PM	1203	South	propane	
2:18 PM	1075	South	propane	

Middlebury US Route 7				
Date: 6/13/2017			2:30 PM - 5:30 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
1:42 PM	1993	North	tt	
1:51 PM	corrosives	South	tt	
2:53 PM	1075	South	propane	
3:12 PM	1993	North	tt	
3:25 PM	1075	South	tt	
4:13 PM	1223	South	propane	
4:54 PM	1075	North	tt	

LEPC #8

Middlebury US Route 7				
Date: 7/6/17		2:50 PM - 5:50 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
2:11 PM	1075	North	propane	
2:22 PM	Dangerous	North	box	
2:42 PM	1203	South	propane	
2:50 PM	1075	South	propane	
2:51 PM	1223	North	propane	
3:10 PM	1075	South	propane	
4:23 PM	1203	South	tt	
4:43 PM	1203	North	tt	
5:04 PM	1203	North	tt	
5:30 PM	1223	South	propane	

Vergennes VT Route 22A				
Date: 4/12/2017		8:30 AM - 12:30 AM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:54 AM	1971	North	tractor trailer	
8:58 AM	1075	South	propane	
8:59 AM	1073	South	tractor trailer	
9:07 AM	1223	South	propane	
9:09 AM	3082	South	propane	
9:15 AM	1203	North	tractor trailer	
9:22 AM	1971	North	tractor trailer	
9:33 AM	1075	North	propane	
9:38 AM	1971	North	tractor trailer	
9:54 AM	1075	North	propane	
9:54 AM	1993	North	tractor trailer	
9:54 AM	1993	North	tractor trailer	
10:30 AM	1075	South	propane	
10:48 AM	1830	South	tractor trailer	
10:59 AM	1203	North	tractor trailer	
11:02 AM	1977	North	tractor trailer	
11:03 AM	3264	South	box truck	
11:21 AM	1075	South	propane	
11:37 AM	1993	South	tractor trailer	
11:43 AM	1223	North	propane	
11:59 AM	1223	South	propane	
12:02 PM	1203	South	tractor trailer	
12:29 PM	1203	North	tractor trailer	

LEPC #8

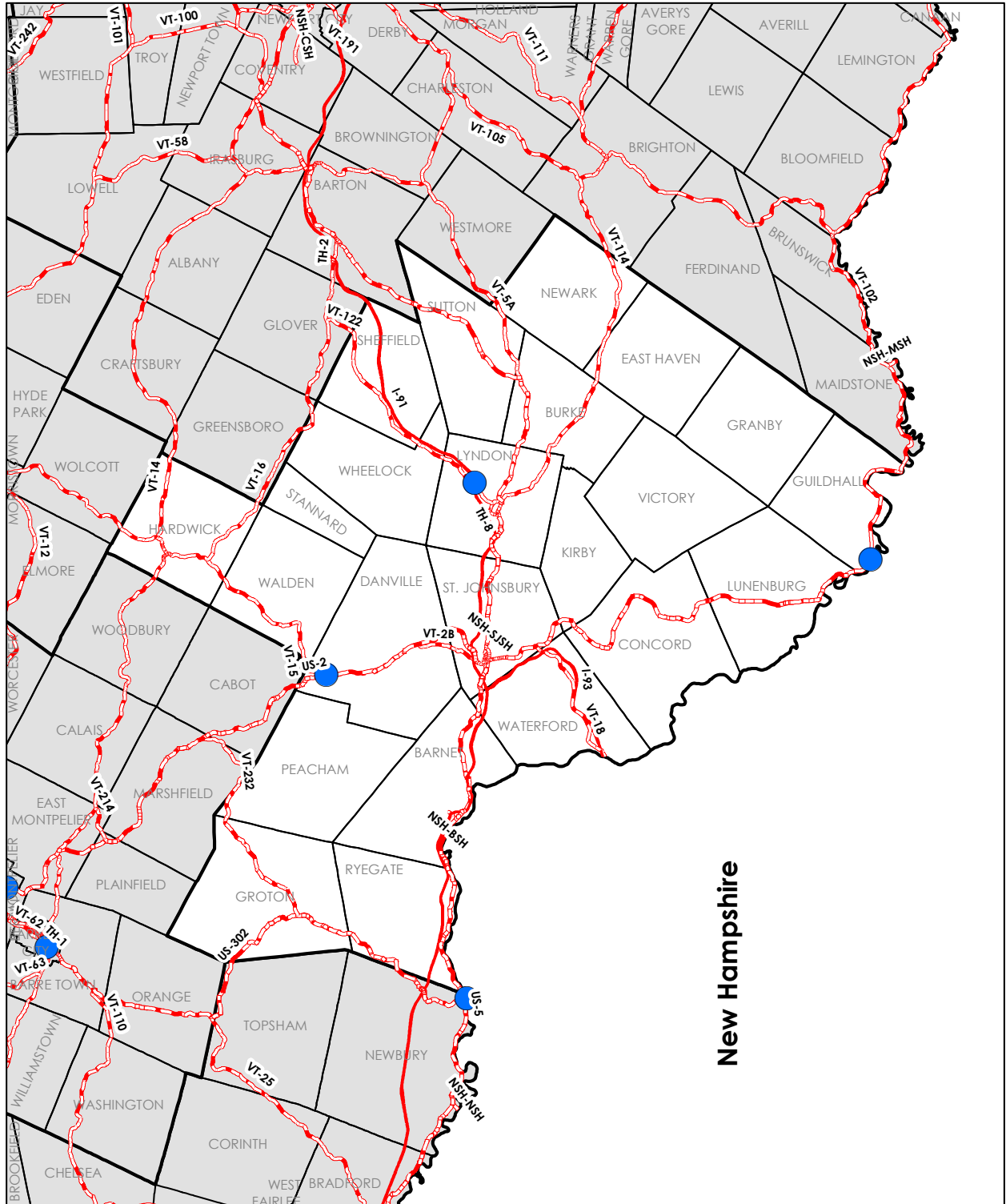
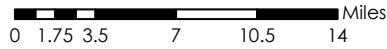
Vergennes VT Route 22A				
Date: 4/28/2017			11:00 AM - 3:00 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
11:15 AM	1203	South	tt	
11:24 AM	1203	North	tt	
12:17 PM	332	South	propane	
12:46 PM	1202	South	tt	
12:50 PM	1203	North	propane	
12:51 PM	1203	North	tt	
1:40 AM	3264	North	propane	
1:46 AM	1203	South	tt	
1:49 AM	1203	South	tt	
1:51 AM	1203	South	tt	
2:38 AM	1075	South	propane	
2:54 AM	1993	North	tt	
2:58 AM	1977	North	tt	

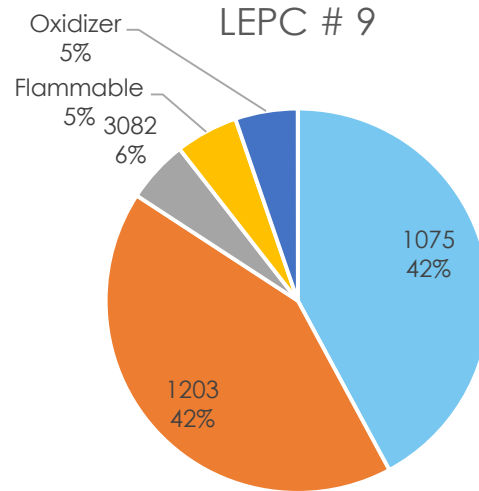
Vergennes VT Route 22A				
Date: 6/28/17		Noon - 4:00 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:13 PM	1971	North	tt	
12:38 PM	1203	South	propane	
12:57 PM	1971	South	tt	
1:27 AM	1971	North	tt	
2:04 AM	1203	South	tt	
2:05 AM	1203	North	tt	
2:16 AM	1863	South	tt	
2:32 AM	1863	South	tt	
2:54 AM	1971	North	tt	
3:00 AM	1203	North	tt	
3:34 AM	1863	North	propane	
3:40 AM	1203	North	tt	
3:53 AM	1203	South	tt	

LEPC #9

HMEP Locations

LEPC # 9  Study Areas





Chair: Richard Fisher and Bryce Allen

RPC: Northeastern Vermont Development Association

Phone: (802) 748-1154

Website: <http://www.nvda.net/emergency-management.php>

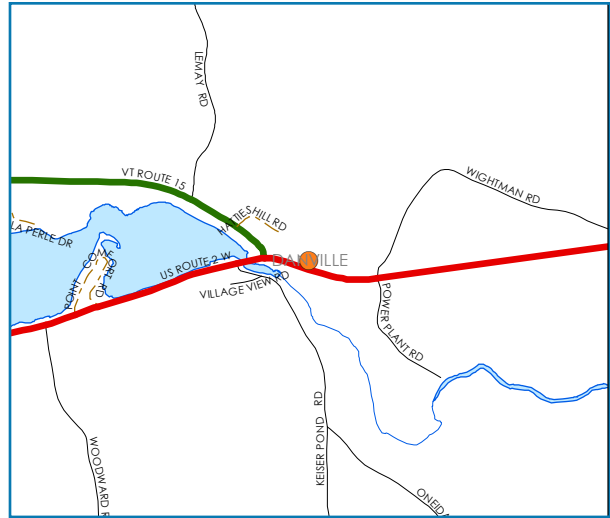
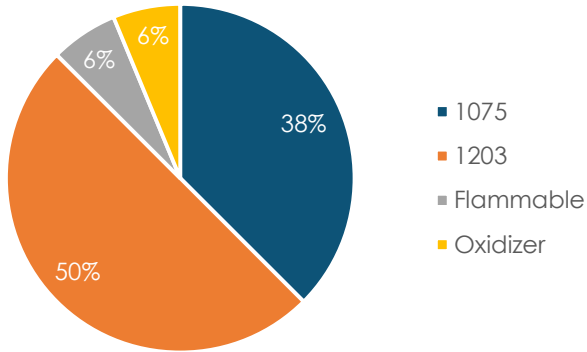
LEPC #9

PO Box 206

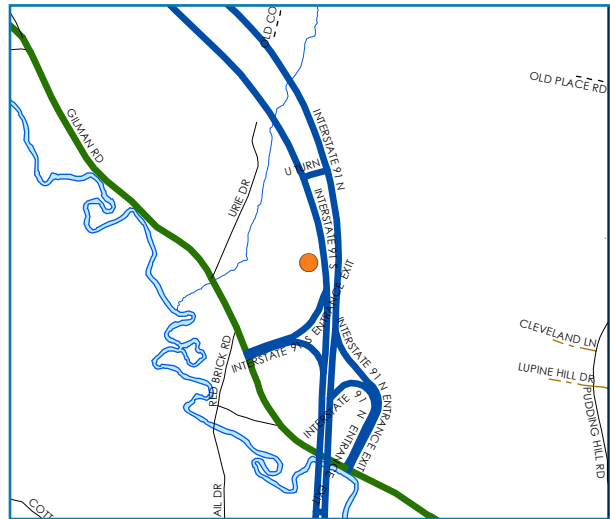
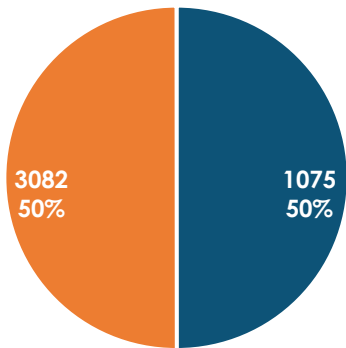
St. Johnsbury, VT 05819

LEPC #9

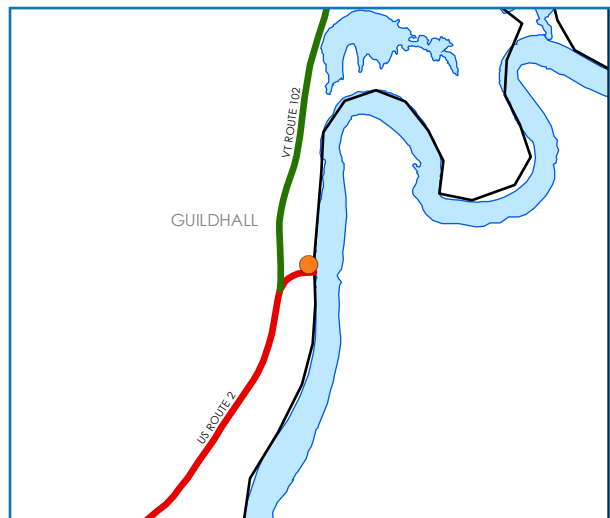
Danville - US 2 East/West



Lyndon I-91 South



Guildford was only surveyed one time, as there was only one placard recorded, which was 1075



Danville US Route 2				
Date: 5/4/2017			9:00 AM - 1:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:04 AM	flammable	east	long truck bed	
9:13 AM	1075	west onto 15	box truck	propane tanks
9:26 AM	1203	east	18 wheeler	
10:07 AM	1203	east	18 wheeler	
11:05 AM	1203	west onto 15	18 wheeler	
11:50 AM	1203	east	18 wheeler	
11:51 AM	oxidizer	east	18 wheeler	

Danville US Route 2				
Date: 6/1/2017			8: 15 AM - 12:15 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
8:24 AM	1075	West	Propane	6 Wheel/ 2 axle
8:53 AM	1203	East	Oil	18 Wheel/ 2 axle
9:36 AM	1203	West	Oil	18 Wheel/ 2 axle
9:44 AM	1075	West	Propane	6 Wheel/ 2 axle
10:01 AM	1075	East	Propane	6 Wheel/ 2 axle
10:05 AM	1075	West	Propane	6 Wheel/ 2 axle

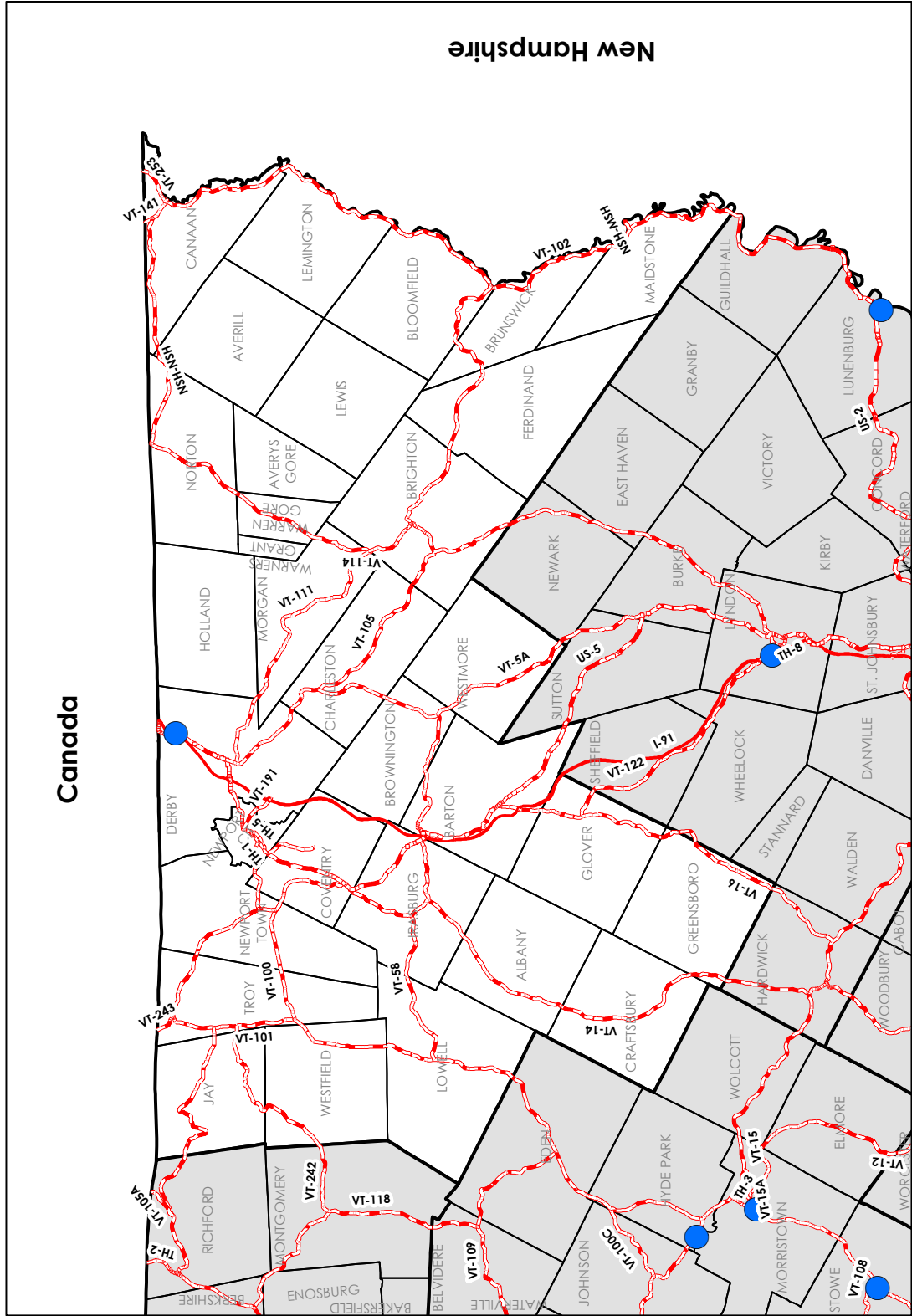
Danville US Route 2				
Date: 6/30/2017			10:00 AM - 2:00 PM	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:00 AM	1075	east	18	
12:00 AM	1203	west	18	
12:00 AM	1203	west	18	

Lyndon Weigh Station Visitors Center I-91 South				
Date: 4/18/2017			10:00 AM - 2:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:00 AM	3082	south	18 wheeler	
12:00 AM	1075	south	18 wheeler	

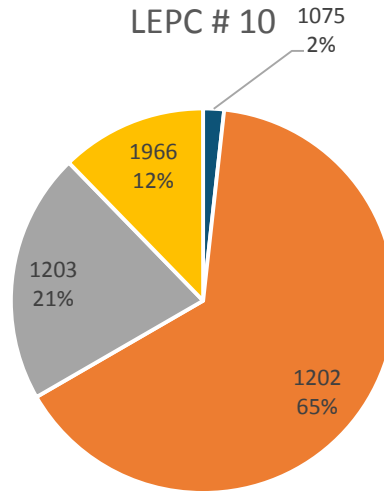
Guilford US Route 2				
Date: 4/13/2017			1015-215	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
1:47 PM	1075	west	propane	



HMEP Locations
LEPC # 10 Study Areas



LEPC #10



Chair: Becky Petelle

RPC: Northeastern Vermont Development Association

Phone: (802) 777-7851

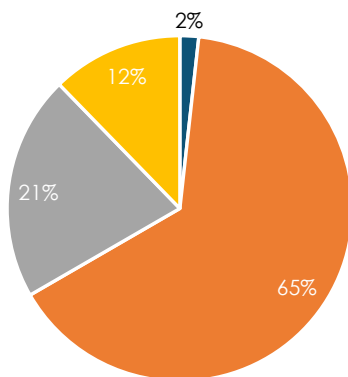
Website: <http://www.nvda.net/emergency-management.php>

LEPC#10 c/o VT Department of Health

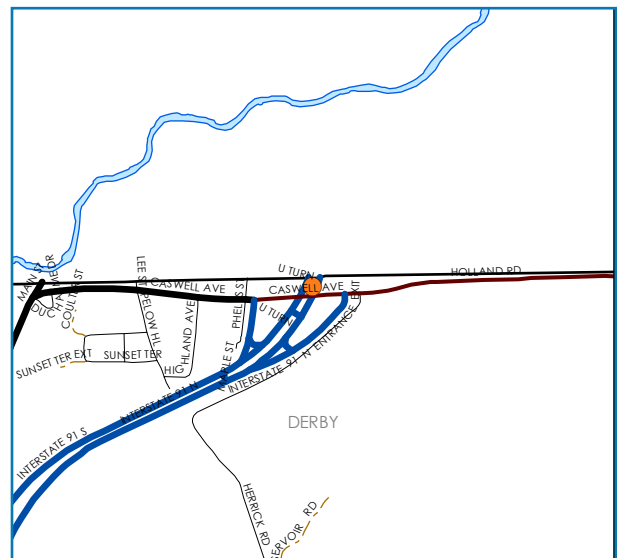
100 Main Street, Suite 220

Newport, VT 05855

Derby Border Crossing South



- 1075
- 1202
- 1203
- 1966



Derby Border Crossing ~ Sample				
Date: 10/4/2016			Time: 800 - Noon	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
8:00am - 9:00am	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		
11:00am - Noon	1203	South		
11:00am - Noon	1203	South		
11:00am - Noon	1202	South		

LEPC #10

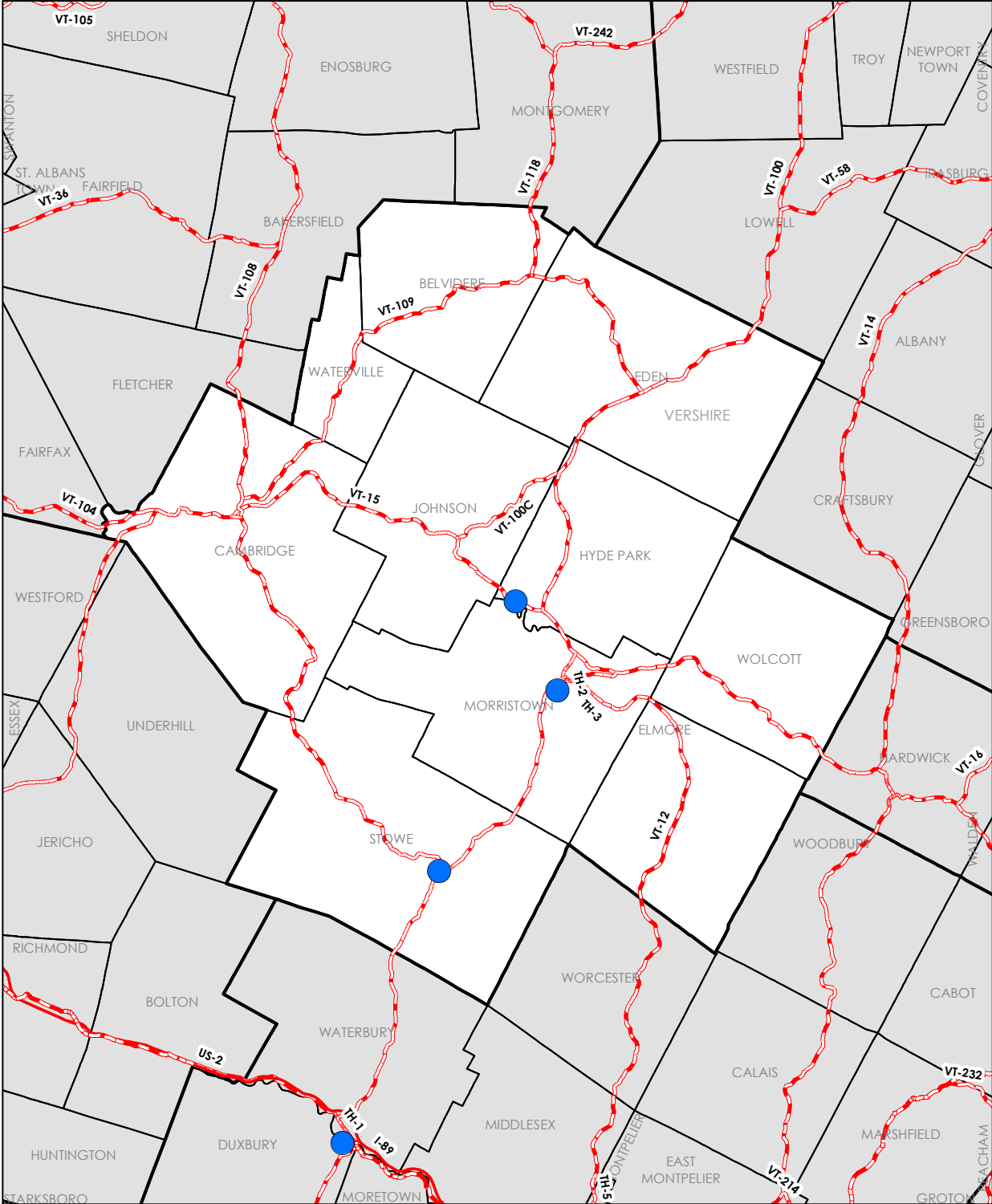
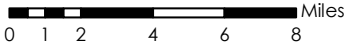
Derby Border Crossing ~ Sample				
Date: 11/19/2016			7:00 - 11:00 a.m.	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		
7:00am - 8:00am	1202	South		

LEPC #10

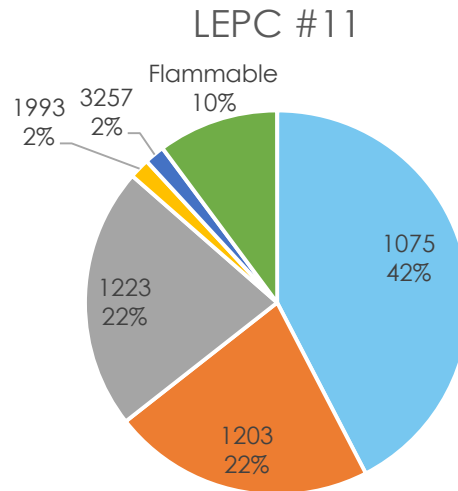
Time	Placard Number	Direction	Vehicle Type	Comments
1:00pm - 2:00pm	1202	South		
1:00pm - 2:00pm	1202	South		

HMEP Locations

LEPC # 11  Study Areas



LEPC #11



Chair: Michael Palagonia

RPC: Lamoille County Planning Commission

Phone: (802) 888-4548

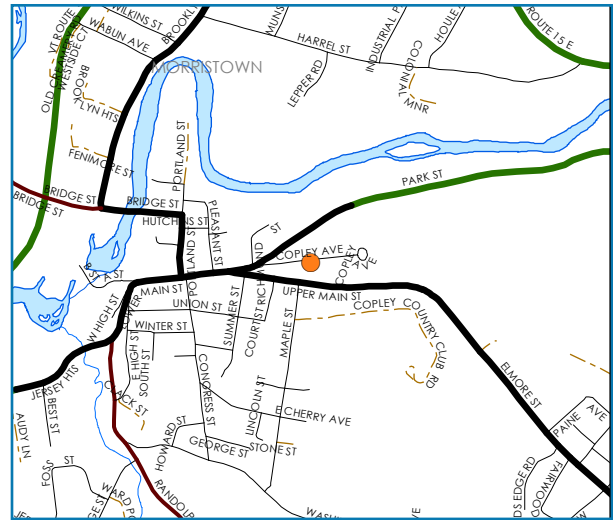
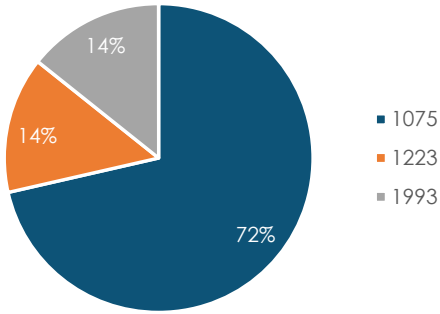
Website: http://www.lcpcvt.org/index.asp?SEC=8A0C2D63-7177-4367-97F9-3F1962626C39&Type=B_BASIC

LEPC#11 c/o LCPC

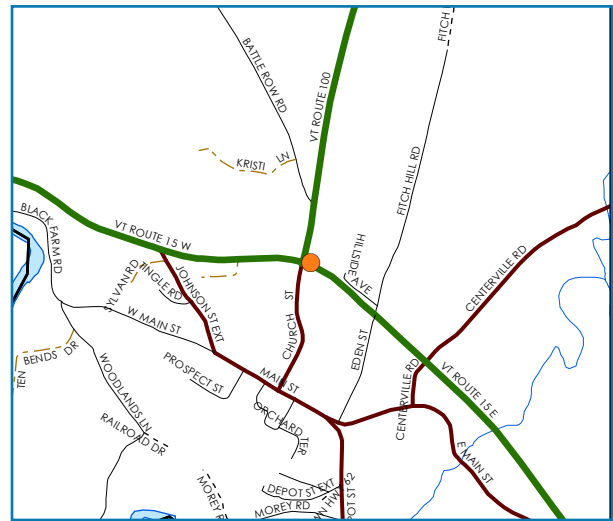
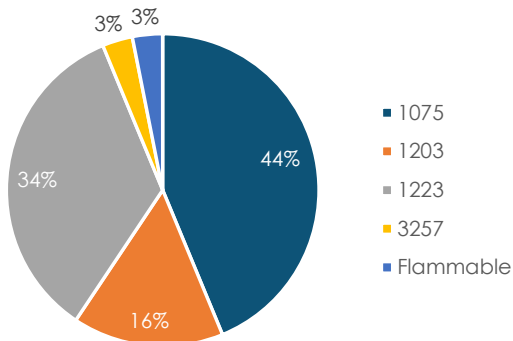
PO Box 1637

Morrisville, VT 05661-1009

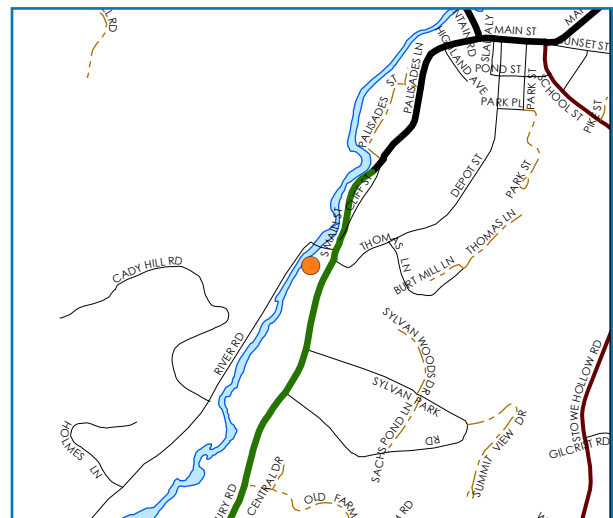
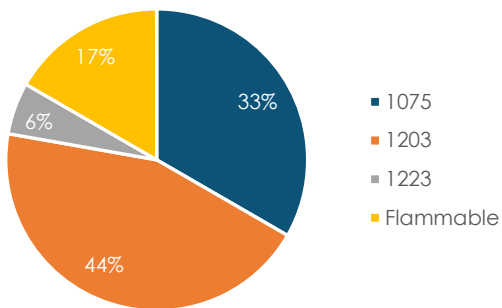
Morrisville - VT Route 12
North/South



Hyde Park - VT 100
North/South



Stowe - VT Route 100
North/South



Morrisville VT Route 12				
Date: 4/6/17		Time: 12:15 PM-4:15PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:41 PM	1075	South	Propane Truck	6 Wheel/ 2 axle
12:50 PM	1075	South	Propane Truck	6 Wheel/ 2 axle
1:03 PM	1075	North	Propane Truck	6 Wheel/ 2 axle
2:44 PM	1075	South	Propane Truck	6 Wheel/ 2 axle
2:59 PM	1075	North	Propane Truck	6 Wheel/ 2 axle
3:47 PM	1993	South	Propane Truck	6 Wheel/ 2 axle

Morrisville VT Route 12				
Date: 5/12/17		12:15 PM - 4:15 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
12:53 PM	1223	North	Oil	6 Wheel/ 2 axle

Morrisville VT Route 12				
Date: 7/3/2017		12:15 PM - 4:15 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
no hazardous trucks				

Hyde Park US 100				
Date: 4/6/17			Time: 8:00-12:00	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:20 AM	1203	South	Gas Truck	6 Wheel/ 2 axle
8:41 AM	1203	North	Gas Truck	22 Wheel/ 6 axle
8:46 AM	1075	North	Propane Truck	6 Wheel/ 2 axle
8:48 AM	1075	South	Propane Truck	6 Wheel/ 2 axle
9:06 AM	1223	South	Oil Truck	6 Wheel/ 2 axle
9:11 AM	1075	South	Propane Truck	6 Wheel/ 2 axle
9:40 AM	1075	North	Utility Truck	4 Wheel/ 2 axle
10:11 AM	1075	North	Propane Truck	6 Wheel/ 2 axle
10:21 AM	1075	South	Gas Truck	18 Wheel/ 5 axle
10:25 AM	1203	South	Gas Truck	22 Wheel/ 6 axle
10:31 AM	1223	North	Oil Truck	6 Wheel/ 2 axle
11:04 AM	1075	North	Propane Truck	6 Wheel/ 2 axle
11:14 AM	Flamable Gas 2: Green sign Flamable Gas 2: Red Sign	North	Box Truck	6 Wheel/ 2 axle
11:15 AM	1223	South	Oil Truck	6 Wheel/ 2 axle
11:19 AM	1223	South	Oil Truck	6 Wheel/ 2 axle
11:31 AM	1075	South	Propane Truck	6 Wheel/ 2 axle
11:46 AM	1075	North	Propane Truck	18 Wheel/ 5 axle
11:55 AM	1075	South	Propane Truck	18 Wheel/ 5 axle

LEPC #11

Hyde Park US 100				
Date: 5/12/17		9:00 AM - 1:00 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
9:10 AM	1223	South	Oil	6 wheel/ 2 axle
9:13 AM	1223	South	Oil	6 wheel/ 2 axle
9:26 AM	1223	South	Oil	6 wheel/ 2 axle
9:34 AM	1223	South	Oil	6 wheel/ 2 axle
10:14 AM	3257	South		22 wheel/ 6 axle
11:28 AM	1075	South	Propane	6 wheel/ 2 axle
11:30 AM	1223	North	Oil	6 wheel/ 2 axle
11:53 AM	1223	North	Oil	6 wheel/ 2 axle

Hyde Park US 100				
Date: 7/4/2017		12:30 PM - 4:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:52 PM	1203	East	18	
1:14 PM	1075	East	propane	
1:47 PM	1203	East	propane	
2:17 PM	1075	East	propane	
2:35 PM	1075	West	propane	
4:12 PM	1223	West	propane	

Stowe VT Route 100				
Date: 4/7/17			Noon - 4:00 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
12:19 PM	1223	North	Oil Truck	6 Wheel/ 2 axle
12:31 PM	1203	North	Gas Truck	18 Wheel/ 5 axle
12:48 PM	1203	South	Gas Truck	18 Wheel/ 5 axle
1:07 AM	1203	South	Gas Truck	22 Wheel/ 6 axle
1:40 AM	1203	North	Gas Truck	22 Wheel/ 6 axle
3:00 AM	1075	South	Propane	10 Wheel/ 3 axle
3:55 AM	1075	North	Propane	18 Wheel/ 5 axle

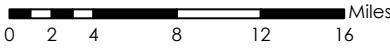
Stowe VT Route 100				
Date: 5/5/17			7:30 AM - 11:30 AM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
7:56 AM	1203	South	Gas	18 Wheel/ 5 axle
9:08 AM	Flammable Gas 2 (Green)(Red)	North		Box Truck
11:01 AM	1203	North	Gas	18 Wheel/ 5 axle

Stowe VT Route 100				
Date: 6/9/17			8:00 AM - Noon	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:30 AM	1203	North	Oil	22 Wheel/ 2 axle
8:40 AM	1075	North	Propane	10 Wheel/ 3 axle
8:52 AM	Flammable Gas 2	North		Box Truck
10:11 AM	1075	South	Propane	6 Wheel/ 2 axle
10:35 AM	1075	North	Propane	22 Wheel/ 2 axle
10:42 AM	1075	South	Propane	6 Wheel/ 2 axle
10:57 AM	Flammable Gas 2	South		Box Truck
11:50 AM	1203	South	Oil	22 Wheel/ 2 axle

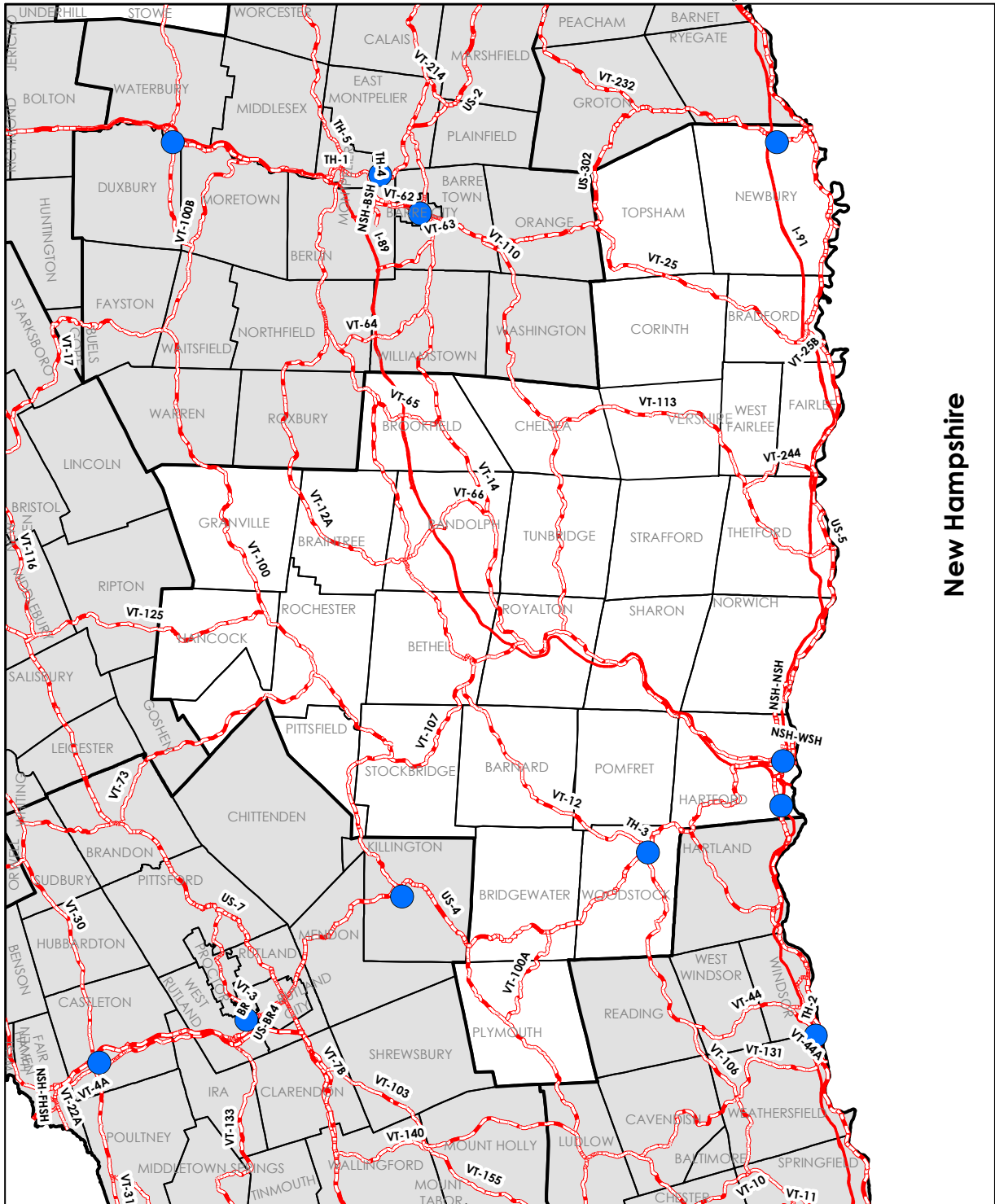
LEPC #12

HMEP Locations

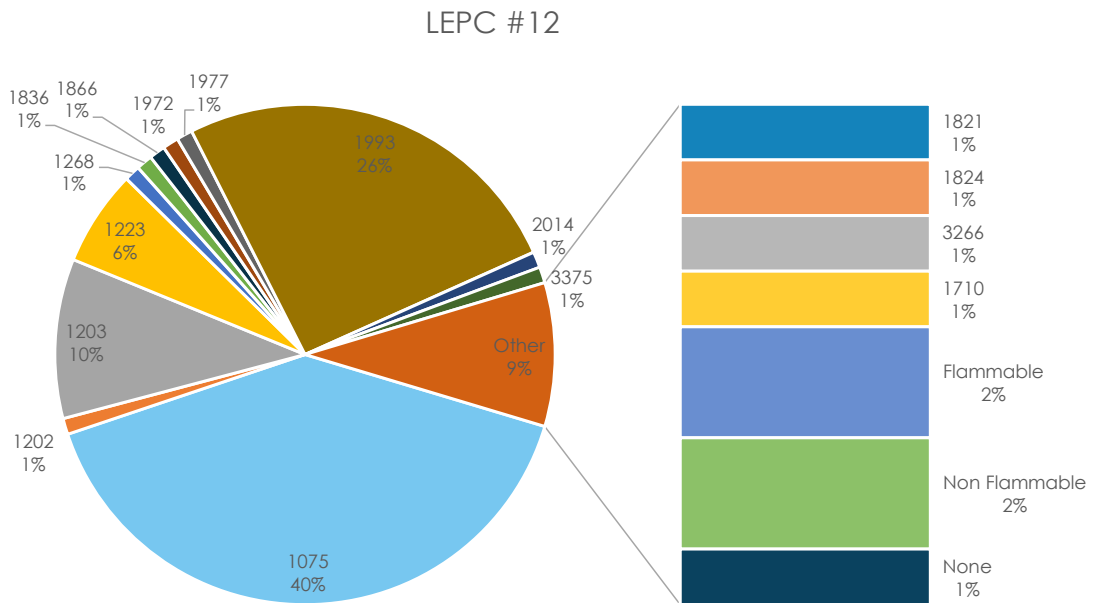
LEPC # 12  Study Areas



TRORC
Two Rivers-Ottawa-Quebec
REGIONAL COMMISSION



New Hampshire



Chair: Mark Warner

RPC: Two Rivers-Ottawaquechee Regional Commission

Phone: (802) 457-3188

Website: <http://www.lepc12.org>

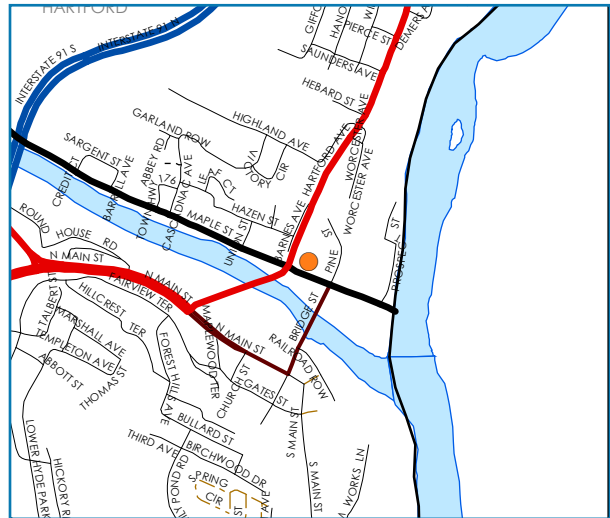
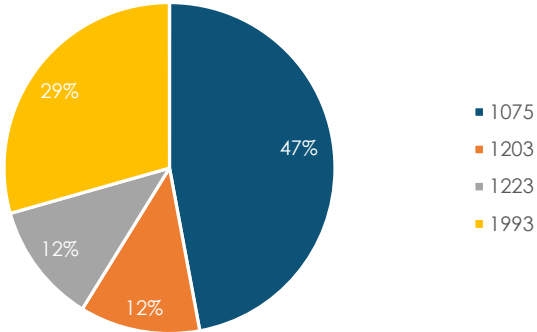
LEPC#12 c/o TRORC

128 King Farm Road

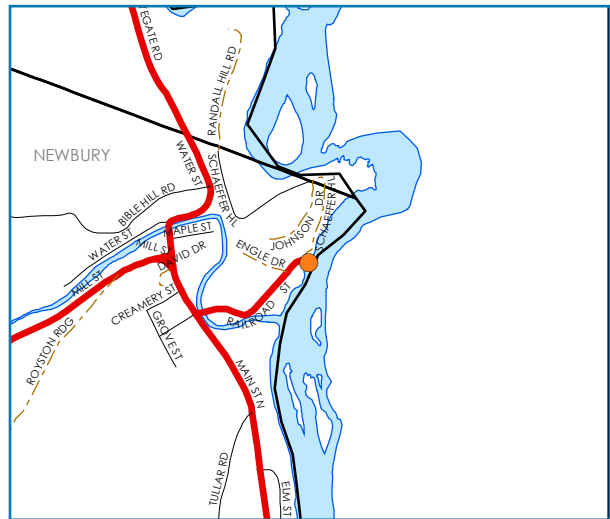
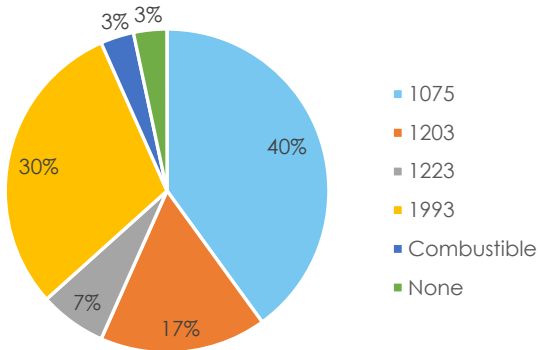
Woodstock, VT 05091

LEPC #12

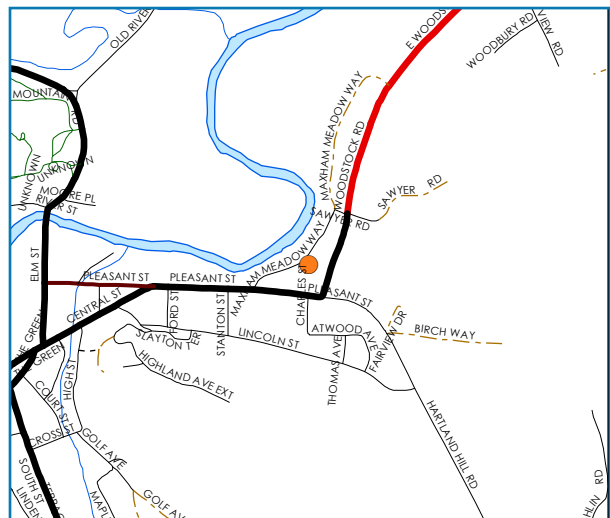
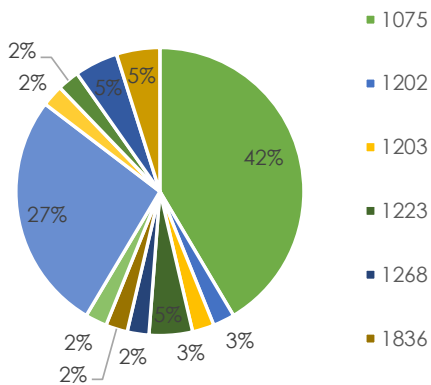
Hartford - US 5 North/South



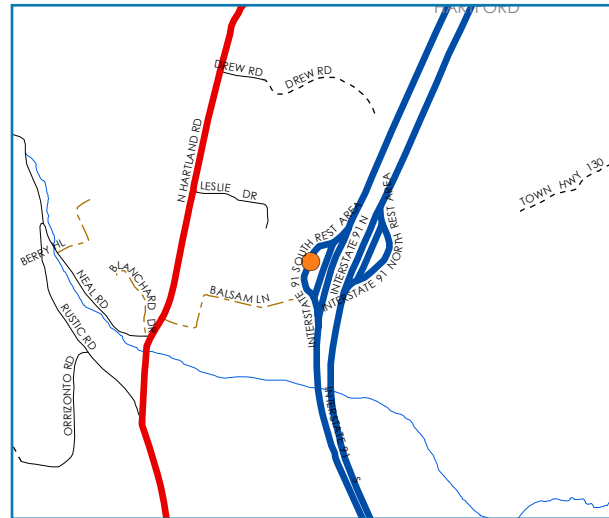
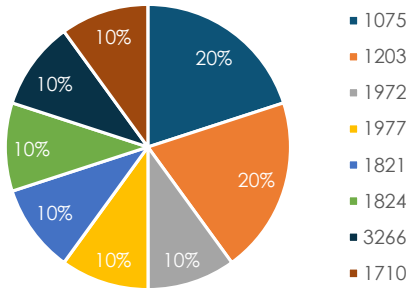
Newbury - US 302 East/West



Woodstock - US 4 East/West



White River Junction - I-91 South



White River Junction Visitors Center I-91 South				
Date: 4/25/2017		9:00 AM - 1:00 PM		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
9:22 AM	1203	south	18 wheeler	
12:00 AM	1203	south	propane	
12:00 AM	1075	south	18 wheeler	
12:00 AM	1977	south	18 wheeler	
12:00 AM	1075	south	propane	
12:00 AM	1972	south	18 wheeler	
12:00 AM	1.82118E+15	south	18 wheeler	

LEPC #12

Hartford US Route 5				
Date: 10/26/2016			Time: 830-1230	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:50 AM	1993	South	propane	
9:17 AM	1203	North	propane	
9:24 AM	1075	South	propane	
9:41 AM	1075	North	propane	
9:45 AM	1223	South	propane	
10:40 AM	1075	North	propane	

Hartford US Route 5				
Date: Nov 11, 2016			12:45 PM - 4:45 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
1:15 AM	1993	North	Small Propane	
1:21 AM	1993	South	Small Propane	
1:54 AM	1075	South	Small Propane	
2:40 AM	1203	South	Gas Truck	6 axle 22 Wheel
3:05 AM	1075	North	Propane	2 axle 6 wheel
3:35 AM	1075	South	Propane	2 axle 6 wheel
4:05 AM	1075	North	Propane	2 axle 6 wheel

Hartford US Route 5				
Date: 4/20/2017			1230-430	
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:45 PM	1993	north	propane	
1:14 PM	1223	north	propane	
2:34 PM	1993	south	propane	
4:10 PM	1075	south	propane	

Newbury US Route 302 and US Route 5				
Date: 4/20/2017			2:30 PM - 5:30 PM	
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
1:53 PM	1993	302 West	short tank	diesal
2:31 PM	1223	302 West	short tank	kerosene
2:39 PM	1075	302 West	short tank	propane
2:45 PM	1203	302 West	semi	gas
3:00 PM	1075	5 South	short tank	propane
3:06 PM	1203	302 East	semi	gas
3:20 PM	1075	302 East	short tank	propane
3:29 PM	1993	302 East	short tank	diesal
3:37 PM	1223	302 East	short tank	kerosene
4:54 PM	none	302 East	semi	biodiesel
5:06 PM	1993	302 West	short tank	diesal

Newbury US Route 302 and US Route 5				
Date: 6/27/17			9:45 AM - 1:45 PM	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
10:33 AM	1203	302 East	18	
10:37 AM	1075	302 East	work truck	
10:41 AM	1993	302 East	gas	
10:45 AM	Combustible	5 North	work truck	
11:04 AM	1075	5 North	19	
12:08 PM	1075	302 East	propane	
12:18 PM	1203	302 East	18	
1:04 AM	1993	302 East	propane	

LEPC #12

Newbury US Route 302 and US Route 5				
Date: 7/10/17		12:30 PM - 4:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
1:04 PM	1993	5 North	propane	
1:14 PM	1203	302 East	propane	
1:21 PM	1993	302 East	propane	
1:57 PM	1993	5 North	propane	
2:09 PM	1075	302 East	propane	
2:14 PM	1993	302 East	propane	
2:14 PM	1075	302 East	propane	
2:42 PM	1075	302 East	work truck	
2:45 PM	1075	302 East	propane	
3:24 PM	1075	5 North	work truck	
4:30 PM	1075	302 East	propane	

Woodstock US 4				
Date: 10/19/2016		8:51 AM - 12:51 PM		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
9:06 AM	Flammable/Non-Flammable	West	box truck	
9:06 AM	1836	West	box truck	
9:14 AM	1223	East	propane	
9:18 AM	1993	West	propane	
9:42 AM	1202	West	F-150	not clearly visible
10:33 AM	1993	East	propane	
10:42 AM	1075	West	propane	
10:45 AM	1268	West	dumptruck	residual waste
10:50 AM	1993	East	propane	
10:53 AM	1075	East	propane	
11:27 AM	1075	East	propane	
11:30 AM	3375	East	12 wheel	
11:37 AM	1993	West	propane	
11:38 AM	1203	West	propane	
11:56 AM	1993	East	propane	
11:57 AM	1075	West	gas	
12:19 PM	1075	East	utility truck	
12:41 PM	1866	West	18 wheeler	

LEPC #12

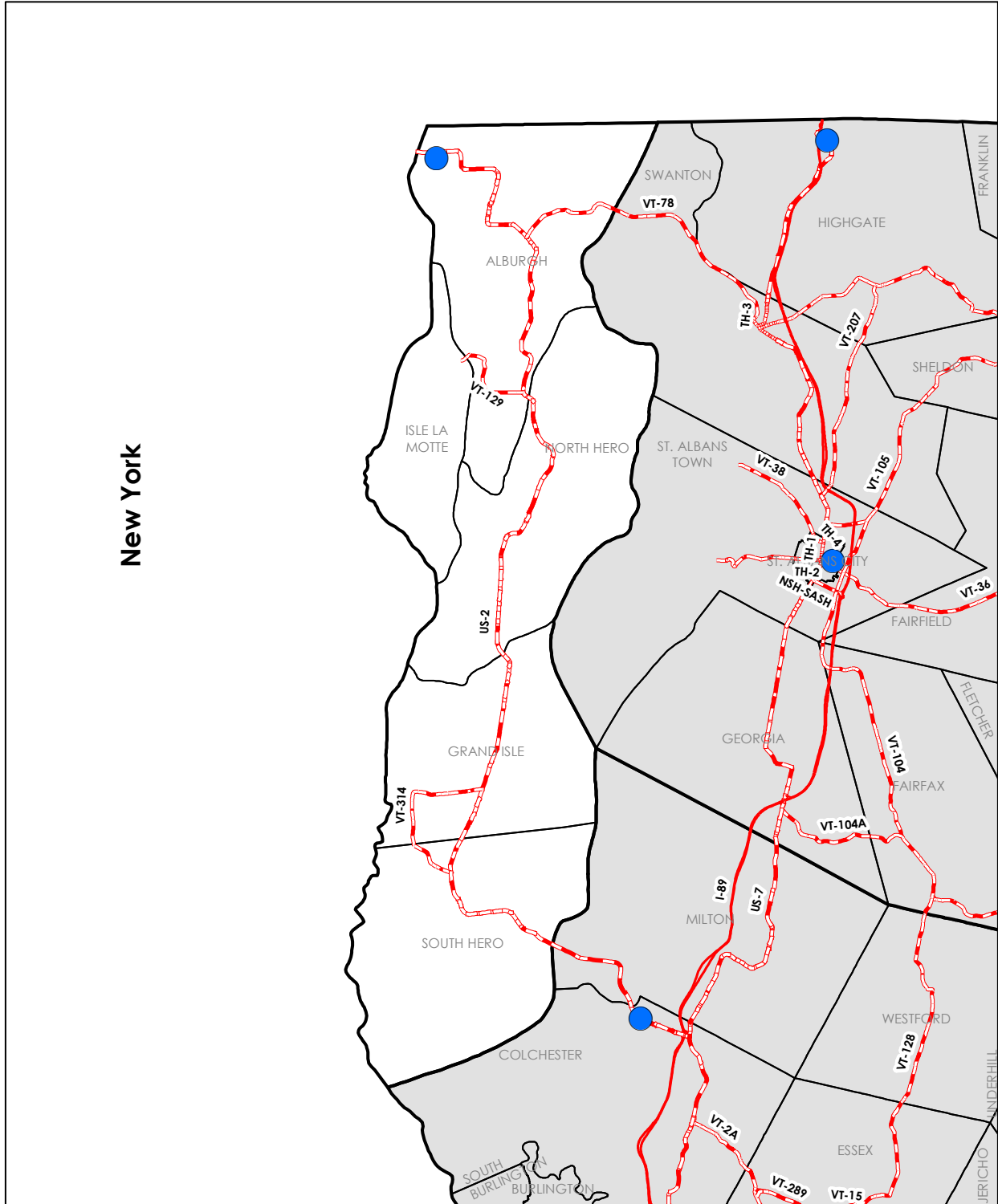
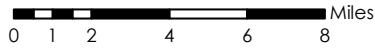
Woodstock US 4				
Date: 3/28/2017			8:00 AM - Noon	
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
8:02 AM	1075	east	propane	
8:20 AM	1075	west	propane	
8:28 AM	1075	east	18 wheeler	
12:00 AM	1993	west	oil	
9:24 AM	1993	east	oil	
9:37 AM	Flammable/Non-Flammable	west	box truck	
9:41 AM	1075	east	propane	
9:43 AM	1075	east	propane	
10:04 AM	1075	east	propane	
10:10 AM	1993	west	6 wheeler oil	
10:12 AM	1223	east	6 wheeler oil	
10:22 AM	1993	west	propane	
10:03 AM	1075	east	propane	
10:56 AM	1075	west	6 wheeler oil	
11:27 AM	1075	west	propane	
11:46 AM	1075	east	18 wheeler	

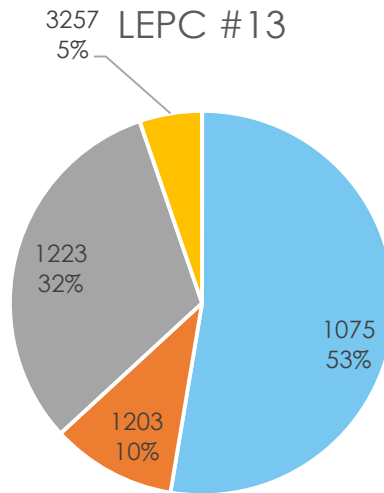
Woodstock US 4				
Date: 5/17/17		12:30 PM - 4:30 PM		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
12:42 PM	1993	East	propane	
1:15 AM	2014	East	propane	
2:38 AM	1993	West	propane	
3:59 AM	1075	West	propane	
4:24 AM	1075	East	propane	

LEPC #13

HMEP Locations

LEPC # 13  Study Areas





Chair: Alan Arthur

RPC: Northwest Regional Planning Commission

Phone: (802) 524-5958

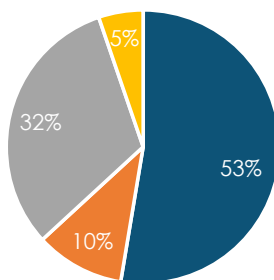
Website: <http://www.nrpcvt.com/>

LEPC#12

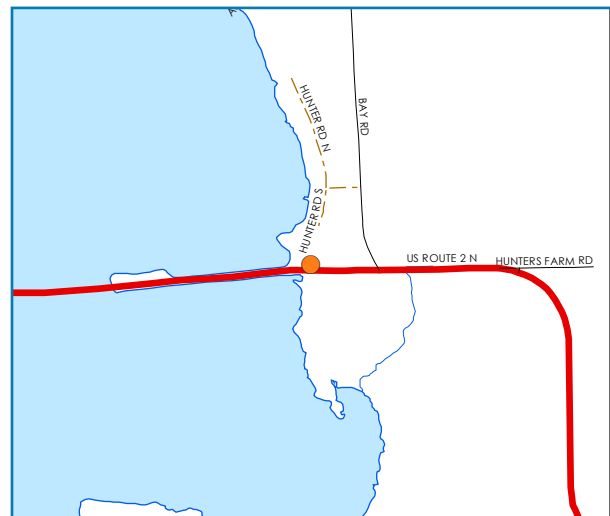
16 Tebeau Terrace

Grand Isle, VT 05458

Alburgh - US 2 East



- 1075
- 1203
- 1223
- 3257



LEPC #13

Alburgh US Route 2 & VT Route 78				
Date: 7/14/2017		8:00 AM to Noon		
Survey 1				
Time	Placard Number	Direction	Vehicle Type	Comments
8:12 AM	1075	VT78 S	Home Delivery (~3,000 gallon)	Propane
8:39 AM	1223	US2 N	Home Delivery (~3,000 gallon)	Kerosene
9:10 AM	3257	US2 N	Large Delivery	Placard read HOT - No number -Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)
10:12 AM	1075	VT78 S	Medium Tanker	Propane
11:24 AM	1075	VT78 S	Medium Tanker	Propane

Alburgh US Route 2 & VT Route 78				
Date: 7/21/2017		8:00 AM - Noon		
Survey 2				
Time	Placard Number	Direction	Vehicle Type	Comments
8:20 AM	1223	VT78 S	Bob Cat	
8:36 AM	1223	US2 N	Bob Cat	
9:08 AM	1075	US2 N	Bob Cat	
10:02 AM	1223	VT78 S	Bob Cat	
10:48 AM	1075	US2 N	Tanker - Stainless	
10:54 AM	1223	VT78 S	Bob Cat	
11:52 AM	1075	VT78 S	Bob Cat	

Alburgh US Route 2 & VT Route 78				
Date: 7/28/2017		8:00 AM - Noon		
Survey 3				
Time	Placard Number	Direction	Vehicle Type	Comments
8:02 AM	1075	VT78 S	Home Delivery (~3,000 gallon)	Propane
8:28 AM	1223	US2 N	Home Delivery (~3,000 gallon)	Kerosene
9:38 AM	1075	US2 N	Home Delivery (~3,000 gallon)	Propane
10:08 AM	1203	VT78 S	Home Delivery (~3,000 gallon)	
10:34 AM	1075	US2 N	Utility	
10:57 AM	1203	VT78 S	Large Tanker	
11:56 AM	1075	VT78 S	Home Delivery (~3,000 gallon)	Propane

Emergency Response Guidebook

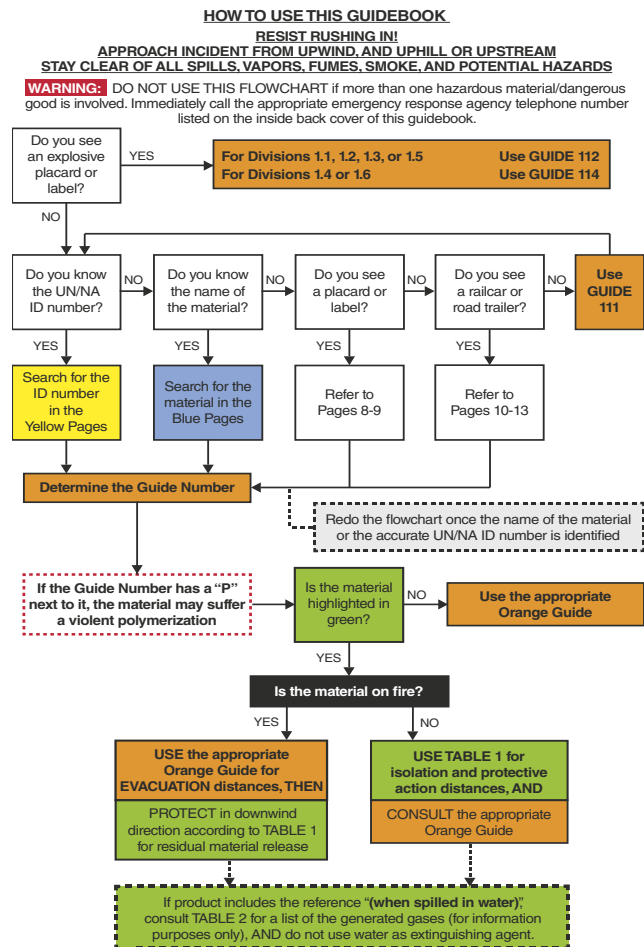
The ERG is a great tool to use for first responders. It is a free publication that you can get from your local fire department or LEPC. There is also a free phone application you can download so you have it at your fingertips 24/7.

The flow chart to the right is taken from the ERG (page 1) and explains how to properly use the book depending on what type of placard is involved in an incident.

Large trucks or other vehicles that do not have placards can pose a hazardous materials threat. Gasoline and diesel are a large fire threat and during spills can contaminate waterways. First responders should always approach situations like these upwind, updown, or upstream, and **never handle these materials without first contacting the Vermont HAZMAT team**. Responder life safety is the priority in these situations.

It is always important to remember that the ERG is intended as a guide for the initial response to a HAZMAT situation. It should not be used for long term abatement.

The following pages (in order by guide number) show the accompanying guide pages with the placards recorded in this study. Some placards show additional directions on how to isolate the situation if a spill were to occur.



BEFORE AN EMERGENCY - BECOME FAMILIAR WITH THIS GUIDEBOOK!
First responders must be trained in the use of this guidebook.

Page 1

Guide 111 should be used for placards that are marked "Dangerous" or for unknown loads if the manifest cannot be reached. **Call the VT HAZMAT Response Team at 1-800-641-5005 during emergencies.** It can also be very useful to write this number on the cover of your ERG so it can be located quickly.


You can download the 2016 Emergency Response Guidebook [here](#).

Placard(s): Dangerous

GUIDE MIXED LOAD/UNIDENTIFIED CARGO 111	MIXED LOAD/UNIDENTIFIED CARGO GUIDE 111
POTENTIAL HAZARDS	EMERGENCY RESPONSE
<p>FIRE OR EXPLOSION</p> <ul style="list-style-type: none"> • May explode from heat, shock, friction or contamination. • May react violently or explosively on contact with air, water or foam. • May be ignited by heat, sparks or flames. • Vapors may travel to source of ignition and flash back. • Containers may explode when heated. • Ruptured cylinders may rocket. <p>HEALTH</p> <ul style="list-style-type: none"> • Inhalation, ingestion or contact with substance may cause severe injury, infection, disease or death. • High concentration of gas may cause asphyxiation without warning. • Contact may cause burns to skin and eyes. • Fire or contact with water may produce irritating, toxic and/or corrosive gases. • Runoff from fire control may cause pollution. <p style="text-align: center;">PUBLIC SAFETY</p> <ul style="list-style-type: none"> • CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. • As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. • Keep unauthorized personnel away. • Stay upwind, uphill and/or upstream. <p>PROTECTIVE CLOTHING</p> <ul style="list-style-type: none"> • Wear positive pressure self-contained breathing apparatus (SCBA). • Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. <p>EVACUATION</p> <p>Fire</p> <ul style="list-style-type: none"> • If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. 	<p>FIRE</p> <p>CAUTION: Material may react with extinguishing agent.</p> <p>Small Fire</p> <ul style="list-style-type: none"> • Dry chemical, CO₂, water spray or regular foam. <p>Large Fire</p> <ul style="list-style-type: none"> • Water spray, fog or regular foam. • Move containers from fire area if you can do it without risk. <p>Fire involving Tanks</p> <ul style="list-style-type: none"> • Cool containers with flooding quantities of water until well after fire is out. • Do not get water inside containers. • Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. • ALWAYS stay away from tanks engulfed in fire. <p>SPILL OR LEAK</p> <ul style="list-style-type: none"> • Do not touch or walk through spilled material. • ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). • All equipment used when handling the product must be grounded. • Keep combustibles (wood, paper, oil, etc.) away from spilled material. • Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. • Prevent entry into waterways, sewers, basements or confined areas. <p>Small Spill</p> <ul style="list-style-type: none"> • Pick up with sand or other non-combustible absorbent material and place into containers for later disposal. <p>Large Spill</p> <ul style="list-style-type: none"> • Dike far ahead of liquid spill for later disposal. <p>FIRST AID</p> <ul style="list-style-type: none"> • Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. • Move victim to fresh air. • Call 911 or emergency medical service. • Give artificial respiration if victim is not breathing. • Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. • Administer oxygen if breathing is difficult. • Remove and isolate contaminated clothing and shoes. • In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes. • Shower and wash with soap and water. • Keep victim calm and warm. • Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
Page 160	Page 161

ERG Pages

Placard(s): Explosives

GUIDE EXPLOSIVES* - DIVISION 1.1, 1.2, 1.3 OR 1.5 112	EXPLOSIVES* - DIVISION 1.1, 1.2, 1.3 OR 1.5 GUIDE 112
POTENTIAL HAZARDS	EMERGENCY RESPONSE
FIRE OR EXPLOSION <ul style="list-style-type: none">• MAY EXPLODE AND THROW FRAGMENTS 1600 METERS (1 MILE) OR MORE IF FIRE REACHES CARGO.• For information on "Compatibility Group" letters, refer to Glossary section.	FIRE CARGO Fire <ul style="list-style-type: none">• DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!• Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn.• Do not move cargo or vehicle if cargo has been exposed to heat. TIRE or VEHICLE Fire <ul style="list-style-type: none">• Use plenty of water - FLOOD it! If water is not available, use CO₂, dry chemical or dirt.• If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.• Pay special attention to tire fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition.
HEALTH <ul style="list-style-type: none">• Fire may produce irritating, corrosive and/or toxic gases.	
PUBLIC SAFETY <ul style="list-style-type: none">• CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.• Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions.• Move people out of line of sight of the scene and away from windows.• Keep unauthorized personnel away.• Stay upwind, uphill and/or upstream.• Ventilate closed spaces before entering.	SPILL OR LEAK <ul style="list-style-type: none">• ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).• All equipment used when handling the product must be grounded.• Do not touch or walk through spilled material.• DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 METERS (330 FEET) OF ELECTRIC DETONATORS.• DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.
PROTECTIVE CLOTHING <ul style="list-style-type: none">• Wear positive pressure self-contained breathing apparatus (SCBA).• Structural firefighters' protective clothing will only provide limited protection.	FIRST AID <ul style="list-style-type: none">• Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.• Move victim to fresh air.• Call 911 or emergency medical service.• Give artificial respiration if victim is not breathing.• Administer oxygen if breathing is difficult.• Remove and isolate contaminated clothing and shoes.• In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
EVACUATION	
Large Spill <ul style="list-style-type: none">• Consider initial EVACUATION for 800 meters (1/2 mile) in all directions.	
Fire <ul style="list-style-type: none">• If rail car or trailer is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, initiate evacuation including emergency responders for 1600 meters (1 mile) in all directions.	
 In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).	* FOR INFORMATION ON "COMPATIBILITY GROUP" LETTERS, REFER TO THE GLOSSARY SECTION.
Page 162 ERG 2016	ERG 2016 Page 163

Placard(s): 1322

GUIDE 113 FLAMMABLE SOLIDS - TOXIC (WET/DESENSITIZED EXPLOSIVE)	FLAMMABLE SOLIDS - TOXIC (WET/DESENSITIZED EXPLOSIVE) GUIDE 113
POTENTIAL HAZARDS	EMERGENCY RESPONSE
FIRE OR EXPLOSION <ul style="list-style-type: none"> Flammable/combustible material. May be ignited by heat, sparks or flames. DRIED OUT material may explode if exposed to heat, flame, friction or shock; treat as an explosive (GUIDE 112). Keep material wet with water or treat as an explosive (GUIDE 112). Runoff to sewer may create fire or explosion hazard. <hr/> HEALTH <ul style="list-style-type: none"> Some are toxic and may be fatal if inhaled, swallowed or absorbed through skin. Contact may cause burns to skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. <hr/> PUBLIC SAFETY <ul style="list-style-type: none"> CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind, uphill and/or upstream. Ventilate closed spaces before entering. <hr/> PROTECTIVE CLOTHING <ul style="list-style-type: none"> Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. <hr/> EVACUATION <p>Large Spill</p> <ul style="list-style-type: none"> Consider initial EVACUATION for 500 meters (1/3 mile) in all directions. <p>Fire</p> <ul style="list-style-type: none"> If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. 	FIRE <p>CARGO Fire</p> <ul style="list-style-type: none"> DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE! Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn. Do not move cargo or vehicle if cargo has been exposed to heat. <p>TIRE or VEHICLE Fire</p> <ul style="list-style-type: none"> Use plenty of water - FLOOD it! If water is not available, use CO₂, dry chemical or dirt. If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area. Pay special attention to tire fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition. <hr/> SPILL OR LEAK <ul style="list-style-type: none"> ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. <p>Small Spill</p> <ul style="list-style-type: none"> Flush area with flooding quantities of water. <p>Large Spill</p> <ul style="list-style-type: none"> Wet down with water and dike for later disposal. KEEP "WETTED" PRODUCT WET BY SLOWLY ADDING FLOODING QUANTITIES OF WATER. <hr/> FIRST AID <ul style="list-style-type: none"> Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Move victim to fresh air. Call 911 or emergency medical service. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Remove and isolate contaminated clothing and shoes. In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).	
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Placard(s): 1966

GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

EXTREMELY FLAMMABLE.

- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075); Butane, (UN1011); Butylene, (UN1012); Isobutylene, (UN1055); Propylene, (UN1077); Isobutane, (UN1969); and Propane, (UN1978), also refer to BLEVE - SAFETY PRECAUTIONS (Page 368)



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)

EMERGENCY RESPONSE

FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

CAUTION: Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.


FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

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Placard(s): Flammable Gas

GUIDE GASES - FLAMMABLE - CORROSIVE 118	GASES - FLAMMABLE - CORROSIVE GUIDE 118
<p style="text-align: center;">POTENTIAL HAZARDS</p> <p>FIRE OR EXPLOSION</p> <ul style="list-style-type: none"> • EXTREMELY FLAMMABLE. • May be ignited by heat, sparks or flames. • May form explosive mixtures with air. • Vapors from liquefied gas are initially heavier than air and spread along ground. • Vapors may travel to source of ignition and flash back. • Some of these materials may react violently with water. • Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. • Containers may explode when heated. • Ruptured cylinders may rocket. <hr/> <p>HEALTH</p> <ul style="list-style-type: none"> • May cause toxic effects if inhaled. • Vapors are extremely irritating. • Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. • Fire will produce irritating, corrosive and/or toxic gases. • Runoff from fire control may cause pollution. <hr/> <p style="text-align: center;">PUBLIC SAFETY</p> <ul style="list-style-type: none"> • CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. • As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. • Keep unauthorized personnel away. • Stay upwind, uphill and/or upstream. • Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). • Ventilate closed spaces before entering. <hr/> <p>PROTECTIVE CLOTHING</p> <ul style="list-style-type: none"> • Wear positive pressure self-contained breathing apparatus (SCBA). • Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. • Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible. <hr/> <p>EVACUATION</p> <p>Large Spill</p> <ul style="list-style-type: none"> • Consider initial downwind evacuation for at least 800 meters (1/2 mile). <p>Fire</p> <ul style="list-style-type: none"> • If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. <hr/> <p> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).</p>	<p style="text-align: center;">EMERGENCY RESPONSE</p> <p>FIRE</p> <ul style="list-style-type: none"> • DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. <p>Small Fire</p> <ul style="list-style-type: none"> • Dry chemical or CO₂. <p>Large Fire</p> <ul style="list-style-type: none"> • Water spray, fog or regular foam. • Move containers from fire area if you can do it without risk. • Damaged cylinders should be handled only by specialists. <p>Fire involving Tanks</p> <ul style="list-style-type: none"> • Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. • Cool containers with flooding quantities of water until well after fire is out. • Do not direct water at source of leak or safety devices; icing may occur. • Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. • ALWAYS stay away from tanks engulfed in fire. <hr/> <p>SPILL OR LEAK</p> <ul style="list-style-type: none"> • ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). • All equipment used when handling the product must be grounded. • Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. • Do not touch or walk through spilled material. • Stop leak if you can do it without risk. • If possible, turn leaking containers so that gas escapes rather than liquid. • Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. • Do not direct water at spill or source of leak. • Isolate area until gas has dispersed. <hr/> <p>FIRST AID</p> <ul style="list-style-type: none"> • Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. • Move victim to fresh air. • Call 911 or emergency medical service. • Give artificial respiration if victim is not breathing. • Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. • Administer oxygen if breathing is difficult. • Remove and isolate contaminated clothing and shoes. • In case of contact with liquefied gas, thaw frosted parts with lukewarm water. • In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin. • Keep victim calm and warm. • Keep victim under observation. • Effects of contact or inhalation may be delayed.

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Placard(s): 1970, 1977, 2187

GUIDE 120 GASES - INERT (INCLUDING REFRIGERATED LIQUIDS)	GASES - INERT (INCLUDING REFRIGERATED LIQUIDS) GUIDE 120		
POTENTIAL HAZARDS	EMERGENCY RESPONSE		
HEALTH <ul style="list-style-type: none">• Vapors may cause dizziness or asphyxiation without warning.• Vapors from liquefied gas are initially heavier than air and spread along ground.• Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.	FIRE <ul style="list-style-type: none">• Use extinguishing agent suitable for type of surrounding fire.• Move containers from fire area if you can do it without risk.• Damaged cylinders should be handled only by specialists.		
FIRE OR EXPLOSION <ul style="list-style-type: none">• Non-flammable gases.• Containers may explode when heated.• Ruptured cylinders may rocket.	Fire involving Tanks <ul style="list-style-type: none">• Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.• Cool containers with flooding quantities of water until well after fire is out.• Do not direct water at source of leak or safety devices; icing may occur.• Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.• ALWAYS stay away from tanks engulfed in fire.		
PUBLIC SAFETY <ul style="list-style-type: none">• CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.• As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.• Keep unauthorized personnel away.• Stay upwind, uphill and/or upstream.• Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).• Ventilate closed spaces before entering.	SPILL OR LEAK <ul style="list-style-type: none">• Do not touch or walk through spilled material.• Stop leak if you can do it without risk.• Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.• Do not direct water at spill or source of leak.• If possible, turn leaking containers so that gas escapes rather than liquid.• Prevent entry into waterways, sewers, basements or confined areas.• Allow substance to evaporate.• Ventilate the area.		
PROTECTIVE CLOTHING <ul style="list-style-type: none">• Wear positive pressure self-contained breathing apparatus (SCBA).• Structural firefighters' protective clothing will only provide limited protection.• Always wear thermal protective clothing when handling refrigerated/cryogenic liquids or solids.	CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.		
EVACUATION <p>Large Spill</p> <ul style="list-style-type: none">• Consider initial downwind evacuation for at least 100 meters (330 feet). <p>Fire</p> <ul style="list-style-type: none">• If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.	FIRST AID <ul style="list-style-type: none">• Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.• Move victim to fresh air.• Call 911 or emergency medical service.• Give artificial respiration if victim is not breathing.• Administer oxygen if breathing is difficult.• Clothing frozen to the skin should be thawed before being removed.• In case of contact with liquefied gas, thaw frosted parts with lukewarm water.• Keep victim calm and warm.		
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Placard(s): Non-Flammable

GUIDE GASES - INERT 121	GASES - INERT GUIDE 121
POTENTIAL HAZARDS	EMERGENCY RESPONSE
<p>HEALTH</p> <ul style="list-style-type: none"> Vapors may cause dizziness or asphyxiation without warning. Vapors from liquefied gas are initially heavier than air and spread along ground. 	<p>FIRE</p> <ul style="list-style-type: none"> Use extinguishing agent suitable for type of surrounding fire. Move containers from fire area if you can do it without risk. Damaged cylinders should be handled only by specialists. <p>Fire Involving Tanks</p> <ul style="list-style-type: none"> Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire.
<p>FIRE OR EXPLOSION</p> <ul style="list-style-type: none"> Non-flammable gases. Containers may explode when heated. Ruptured cylinders may rocket. 	<p>SPILL OR LEAK</p> <ul style="list-style-type: none"> Do not touch or walk through spilled material. Stop leak if you can do it without risk. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak. If possible, turn leaking containers so that gas escapes rather than liquid. Prevent entry into waterways, sewers, basements or confined areas. Allow substance to evaporate. Ventilate the area.
PUBLIC SAFETY	<p>FIRST AID</p> <ul style="list-style-type: none"> Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Move victim to fresh air. Call 911 or emergency medical service. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim calm and warm.
<ul style="list-style-type: none"> CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind, uphill and/or upstream. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Ventilate closed spaces before entering. 	
<p>PROTECTIVE CLOTHING</p> <ul style="list-style-type: none"> Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. 	
<p>EVACUATION</p> <p>Large Spill</p> <ul style="list-style-type: none"> Consider initial downwind evacuation for at least 100 meters (330 feet). <p>Fire</p> <ul style="list-style-type: none"> If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. 	

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Placard(s): 1073, Oxygen

GUIDE 122 GASES - OXIDIZING (INCLUDING REFRIGERATED LIQUIDS)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Substance does not burn but will support combustion.
- Some may react explosively with fuels.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Runoff may create fire or explosion hazard.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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GUIDE 122 GASES - OXIDIZING (INCLUDING REFRIGERATED LIQUIDS)

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire.

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.
- Allow substance to evaporate.
- Isolate area until gas has dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.

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Placard(s): 1005

GUIDE 125 GASES - CORROSIVE

POTENTIAL HAZARDS

HEALTH

- **TOXIC; may be fatal if inhaled, ingested or absorbed through skin.**
- Vapors are extremely irritating and corrosive.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control may cause pollution.

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Some of these materials may react violently with water.
- Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.
- For UN1005: Anhydrous ammonia, at high concentrations in confined spaces, presents a flammability risk if a source of ignition is introduced.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

GASES - CORROSIVE GUIDE 125

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Do not get water inside containers.
- Damaged cylinders should be handled only by specialists.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Isolate area until gas has dispersed.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- **In case of contact with Hydrogen fluoride, anhydrous (UN1052),** flush with large amounts of water. For skin contact, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available. For eyes, flush with water or a saline solution for 15 minutes.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

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Placard(s): 1005

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)			LARGE SPILLS (From a large package or from many small packages)		
			First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during	
				DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1005	125	Ammonia, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3		
1005	125	Anhydrous ammonia						
1008	125	Boron trifluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.4 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)
1008	125	Boron trifluoride, compressed						
1016	119	Carbon monoxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.4 km (2.8 mi)
1016	119	Carbon monoxide, compressed						
1017	124	Chlorine	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	Refer to table 3		
1026	119	Cyanogen	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)
1040	119P	Ethylene oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3		
1040	119P	Ethylene oxide with Nitrogen						
1045	124	Fluorine	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.5 km (0.3 mi)	2.2 km (1.4 mi)
1045	124	Fluorine, compressed						
1048	125	Hydrogen bromide, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)
1050	125	Hydrogen chloride, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	Refer to table 3		
1051	117	AC (when used as a weapon)	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	3.7 km (2.3 mi)	8.4 km (5.3 mi)
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide	60 m (200 ft)	0.2 km (0.2 mi)	0.9 km (0.6 mi)	300 m (1000 ft)	1.1 km (0.7 mi)	2.4 km (1.5 mi)
1051	117	Hydrogen cyanide, anhydrous, stabilized						
1051	117	Hydrogen cyanide, stabilized						

TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

TRANSPORT CONTAINER	First ISOLATE in all Directions Meters (Feet)		Then PROTECT persons Downwind during											
			DAY			NIGHT								
			Low wind (< 6 mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind (> 12 mph = > 20 km/h)	Low wind (< 6 mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind (> 12 mph = > 20 km/h)						
UN1005 Ammonia, anhydrous: Large Spills														
Rail tank car	300	(1000)	1.7	(1.1)	1.3	(0.8)	1.0	(0.6)	4.3	(2.7)	2.3	(1.4)	1.3	(0.8)
Highway tank truck or trailer	150	(500)	0.9	(0.6)	0.5	(0.3)	0.4	(0.3)	2.0	(1.3)	0.8	(0.5)	0.6	(0.4)
Agricultural nurse tank	60	(200)	0.5	(0.3)	0.3	(0.2)	0.3	(0.2)	1.3	(0.8)	0.3	(0.2)	0.3	(0.2)
Multiple small cylinders	30	(100)	0.3	(0.2)	0.2	(0.1)	0.1	(0.1)	0.7	(0.5)	0.3	(0.2)	0.2	(0.1)
UN1017 Chlorine: Large Spills														
Rail tank car	1000	(3000)	9.9	(6.2)	6.4	(4.0)	5.1	(3.2)	11+	(7+)	9.0	(5.6)	6.7	(4.2)
Highway tank truck or trailer	600	(2000)	5.8	(3.6)	3.4	(2.1)	2.9	(1.8)	6.7	(4.3)	5.0	(3.1)	4.1	(2.5)
Multiple ton cylinders	300	(1000)	2.1	(1.3)	1.3	(0.8)	1.0	(0.6)	4.0	(2.5)	2.4	(1.5)	1.3	(0.8)
Multiple small cylinders or single ton cylinder	150	(500)	1.5	(0.9)	0.8	(0.5)	0.5	(0.3)	2.9	(1.8)	1.3	(0.8)	0.6	(0.4)

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"+" means distance can be larger in certain atmospheric conditions

Placard(s): 1950

GUIDE 126 GASES - COMPRESSED OR LIQUEFIED (INCLUDING REFRIGERANT GASES)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating, corrosive and/or toxic gases.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

GASES - COMPRESSED OR LIQUEFIED (INCLUDING REFRIGERANT GASES) **GUIDE 126**

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire.

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- Some of these materials, if spilled, may evaporate leaving a flammable residue.

SPILL OR LEAK

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Allow substance to evaporate.
- Ventilate the area.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.

ERG Pages

Placard(s): 1090, 1170, 1193, 1197, 1266, 1866, 3065, Flammable

GUIDE 127 FLAMMABLE LIQUIDS (WATER-MISCIBLE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

HEALTH

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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FLAMMABLE LIQUIDS (WATER-MISCIBLE) GUIDE 127

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

CAUTION: For fire involving UN1170, UN1987 or UN3475, alcohol-resistant foam should be used.

Small Fire

- Dry chemical, CO₂, water spray or alcohol-resistant foam.

Large Fire

- Water spray, fog or alcohol-resistant foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

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Placard(s): 113, 1263, 2301, 3257

GUIDE 128 FLAMMABLE LIQUIDS
(WATER-IMMISCIBLE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.
- Substance may be transported hot.
- For hybrid vehicles, GUIDE 147 (lithium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.
- **If molten aluminum is involved, refer to GUIDE 169.**

HEALTH

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

FLAMMABLE LIQUIDS **GUIDE 128**
(WATER-IMMISCIBLE)

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective.

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

ERG Pages

Placard(s): 1123, 1219, 2053

GUIDE 129 FLAMMABLE LIQUIDS (WATER-MISCIBLE/NOXIOUS)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

HEALTH

- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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FLAMMABLE LIQUIDS (WATER-MISCIBLE/NOXIOUS) GUIDE 129

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

Small Fire

- Dry chemical, CO₂, water spray or alcohol-resistant foam.
- **Do not use dry chemical extinguishers to control fires involving nitromethane (UN1261) or nitroethane (UN2842).**

Large Fire

- Water spray, fog or alcohol-resistant foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

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Placard(s): 1126, 1175, 1233, 1294, 1999, 2528

GUIDE 130 FLAMMABLE LIQUIDS
(WATER-IMMISCIBLE/NOXIOUS)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

HEALTH

- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

FLAMMABLE LIQUIDS **GUIDE 130**
(WATER-IMMISCIBLE/NOXIOUS)

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- **ALWAYS** stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

ERG Pages

Placard(s): 1992

GUIDE FLAMMABLE LIQUIDS - TOXIC 131

POTENTIAL HAZARDS

HEALTH

- **TOXIC; may be fatal if inhaled, ingested or absorbed through skin.**
- Inhalation or contact with some of these materials will irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.**
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion and poison hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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FLAMMABLE LIQUIDS - TOXIC GUIDE 131

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

Small Fire

- Dry chemical, CO₂, water spray or alcohol-resistant foam.

Large Fire

- Water spray, fog or alcohol-resistant foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Use water spray or fog; do not use straight streams.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.

Small Spill

- Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin. • Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

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Placard(s): 1289, 2209, 2734, 2789, 2924

GUIDE FLAMMABLE LIQUIDS - CORROSIVE
132

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

HEALTH

- May cause toxic effects if inhaled or ingested/swallowed.
- Contact with substance may cause severe burns to skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

FLAMMABLE LIQUIDS - CORROSIVE **GUIDE**
132

EMERGENCY RESPONSE

FIRE

- **Some of these materials may react violently with water.**

Small Fire

- Dry chemical, CO₂, water spray or alcohol-resistant foam.

Large Fire

- Water spray, fog or alcohol-resistant foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Do not get water inside containers.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb with earth, sand or other non-combustible material and transfer to containers (except for Hydrazine).
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

ERG Pages

Placard(s): 1325, 3181

GUIDE 133 FLAMMABLE SOLIDS

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by friction, heat, sparks or flames.
- Some may burn rapidly with flare-burning effect.
- Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.
- Substance may be transported in a molten form at a temperature that may be above its flash point.
- May re-ignite after fire is extinguished.

HEALTH

- Fire may produce irritating and/or toxic gases.
- Contact may cause burns to skin and eyes.
- Contact with molten substance may cause severe burns to skin and eyes.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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FLAMMABLE SOLIDS GUIDE 133

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, sand, earth, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

Fire Involving Metal Pigments or Pastes (e.g. "Aluminum Paste")

- Aluminum Paste fires should be treated as a combustible metal fire. Use DRY sand, graphite powder, dry sodium chloride-based extinguishers, G-1[®] or Met-L-X[®] powder. Also, see GUIDE 170.

Fire involving Tanks or Car/Trailer Loads

- Cool containers with flooding quantities of water until well after fire is out.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch or walk through spilled material.

Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

Large Spill

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Removal of solidified molten material from skin requires medical assistance.
- Keep victim calm and warm.

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Placard(s): Combustible

GUIDE 136 SUBSTANCES - SPONTANEOUSLY COMBUSTIBLE - TOXIC AND/OR CORROSIVE (AIR-REACTIVE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Extremely flammable; will ignite itself if exposed to air.
- Burns rapidly, releasing dense, white, irritating fumes.
- Substance may be transported in a molten form.
- May re-ignite after fire is extinguished.
- Corrosive substances in contact with metals may produce flammable hydrogen gas.
- Containers may explode when heated.

HEALTH

- Fire will produce irritating, corrosive and/or toxic gases.
- **TOXIC**; ingestion of substance or inhalation of decomposition products will cause severe injury or death.
- Contact with substance may cause severe burns to skin and eyes.
- Some effects may be experienced due to skin absorption.
- Runoff from fire control may be corrosive and/or toxic and cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- **For Phosphorus (UN1381): Special aluminized protective clothing should be worn when direct contact with the substance is possible.**

EVACUATION

Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

SUBSTANCES - SPONTANEOUSLY COMBUSTIBLE - TOXIC AND/OR CORROSIVE (AIR-REACTIVE) **GUIDE 136**

EMERGENCY RESPONSE

FIRE

Small Fire

- Water spray, wet sand or wet earth.

Large Fire

- Water spray or fog.
- **Do not scatter spilled material with high-pressure water streams.**
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- **ALWAYS** stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- **ELIMINATE** all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch or walk through spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.

Small Spill

- Cover with water, sand or earth. Shovel into metal container and keep material under water.

Large Spill

- Dike for later disposal and cover with wet sand or earth.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, keep exposed skin areas immersed in water or covered with wet bandages until medical attention is received.
- Removal of solidified molten material from skin requires medical assistance.
- Remove and isolate contaminated clothing and shoes at the site and place in metal container filled with water. Fire hazard if allowed to dry.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Keep victim calm and warm.

ERG Pages

Placard(s): 1836, 1830

GUIDE SUBSTANCES - WATER-REACTIVE - CORROSIVE 137

POTENTIAL HAZARDS

HEALTH

- CORROSIVE and/or TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Fire will produce irritating, corrosive and/or toxic gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Contact with molten substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

- **EXCEPT FOR ACETIC ANHYDRIDE (UN1715), THAT IS FLAMMABLE**, some of these materials may burn, but none ignite readily.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Substance will react with water (some violently), releasing corrosive and/or toxic gases and runoff.
- Flammable/toxic gases may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.
- Substance may be transported in a molten form.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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SUBSTANCES - WATER-REACTIVE - CORROSIVE GUIDE 137

EMERGENCY RESPONSE

FIRE

- **When material is not involved in fire, do not use water on material itself.**

Small Fire

- Dry chemical or CO₂.
- Move containers from fire area if you can do it without risk.

Large Fire

- Flood fire area with large quantities of water, while knocking down vapors with water fog. If insufficient water supply: knock down vapors only.

Fire involving Tanks or Car/Trailer Loads

- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Small Spill

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Removal of solidified molten material from skin requires medical assistance.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

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Placard(s): 1836

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)							
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during					
			Meters	(Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters	(Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)				
1828	137	Sulfur chlorides (when spilled on land)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.3 km	(0.2 mi)	0.4 km	(0.3 mi)
1828	137	Sulfur chlorides (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	30 m	(100 ft)	0.3 km	(0.2 mi)	1.1 km	(0.7 mi)
1828	137	Sulphur chlorides (when spilled on land)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.3 km	(0.2 mi)	0.4 km	(0.3 mi)
1828	137	Sulphur chlorides (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	30 m	(100 ft)	0.3 km	(0.2 mi)	1.1 km	(0.7 mi)
1829	137	Sulfur trioxide, stabilized	60 m	(200 ft)	0.4 km	(0.2 mi)	1.0 km	(0.6 mi)	300 m	(1000 ft)	2.9 km	(1.8 mi)	5.7 km	(3.6 mi)
1829	137	Sulphur trioxide, stabilized												
1831	137	Sulfuric acid, fuming	60 m	(200 ft)	0.4 km	(0.2 mi)	1.0 km	(0.6 mi)	300 m	(1000 ft)	2.9 km	(1.8 mi)	5.7 km	(3.6 mi)
1831	137	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide												
1831	137	Sulphuric acid, fuming												
1831	137	Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide												
1834	137	Sulfuryl chloride (when spilled on land)	30 m	(100 ft)	0.2 km	(0.1 mi)	0.4 km	(0.3 mi)	60 m	(200 ft)	0.8 km	(0.5 mi)	1.5 km	(1.0 mi)
1834	137	Sulfuryl chloride (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.6 km	(1.0 mi)
1834	137	Sulphuryl chloride (when spilled on land)	30 m	(100 ft)	0.2 km	(0.1 mi)	0.4 km	(0.3 mi)	60 m	(200 ft)	0.8 km	(0.5 mi)	1.5 km	(1.0 mi)
1834	137	Sulphuryl chloride (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.6 km	(1.0 mi)
1836	137	Thionyl chloride (when spilled on land)	30 m	(100 ft)	0.2 km	(0.2 mi)	0.6 km	(0.4 mi)	60 m	(200 ft)	0.7 km	(0.5 mi)	1.5 km	(0.9 mi)

"+" means distance can be larger in certain atmospheric conditions

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Placard(s): Dangerous When Wet, Electrocutation Conduction Hazard

GUIDE 139 SUBSTANCES - WATER-REACTIVE
(EMITTING FLAMMABLE AND TOXIC GASES)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Produce flammable and toxic gases on contact with water.
- May ignite on contact with water or moist air.
- Some react vigorously or explosively on contact with water.
- May be ignited by heat, sparks or flames.
- May re-ignite after fire is extinguished.
- Some are transported in highly flammable liquids.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Highly toxic: contact with water produces toxic gas, may be fatal if inhaled.
- Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death.
- May produce corrosive solutions on contact with water.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate the area before entry.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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SUBSTANCES - WATER-REACTIVE
(EMITTING FLAMMABLE AND TOXIC GASES) **GUIDE 139**

EMERGENCY RESPONSE

FIRE

- **DO NOT USE WATER OR FOAM. (FOAM MAY BE USED FOR CHLOROSILANES, SEE BELOW)**
- Small Fire**
 - Dry chemical, soda ash, lime or sand.
- Large Fire**
 - DRY sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.
 - **FOR CHLOROSILANES, DO NOT USE WATER;** use AFFF alcohol-resistant medium-expansion foam; **DO NOT USE** dry chemicals, soda ash or lime on chlorosilane fires (large or small) as they may release large quantities of hydrogen gas that may explode.
 - Move containers from fire area if you can do it without risk.
- Fire involving Tanks or Car/Trailer Loads**
 - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
 - Cool containers with flooding quantities of water until well after fire is out.
 - Do not get water inside containers.
 - Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
 - ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- **FOR CHLOROSILANES,** use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- Small Spill**
 - Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
 - Dike for later disposal; do not apply water unless directed to do so.
- Powder Spill**
 - Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
 - **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

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Placard(s): 1486, 1942, 2014, 3149, 3375, 1627

GUIDE 140 OXIDIZERS

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- Some may decompose explosively when heated or involved in a fire.
- May explode from heat or contamination.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

OXIDIZERS GUIDE 140

EMERGENCY RESPONSE

FIRE

Small Fire

- Use water. Do not use dry chemicals or foams. CO₂ or Halon® may provide limited control.

Large Fire

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Do not get water inside containers.

Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

Small Liquid Spill

- Use a non-combustible material like vermiculite or sand to soak up the product and place into a container for later disposal.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- **Following product recovery, flush area with water.**

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

ERG Pages

Placard(s): 1627

GUIDE OXIDIZERS - TOXIC 141

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- May explode from heat or contamination.
- Some may burn rapidly.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Toxic by ingestion.
- Inhalation of dust is toxic.
- Fire may produce irritating, corrosive and/or toxic gases.
- Contact with substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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OXIDIZERS - TOXIC GUIDE 141

EMERGENCY RESPONSE

FIRE

Small Fire

- Use water. Do not use dry chemicals or foams. CO₂ or Halon® may provide limited control.

Large Fire

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.

Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

Large Spill

- Dike far ahead of spill for later disposal.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

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Placard(s): Oxidizer

GUIDE OXIDIZERS (UNSTABLE)
143

OXIDIZERS (UNSTABLE) **GUIDE**
143

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from friction, heat or contamination.
- These substances will accelerate burning when involved in a fire.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Some will react explosively with hydrocarbons (fuels).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- **TOXIC**; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Fire may produce irritating and/or toxic gases.
- Toxic fumes or dust may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

EMERGENCY RESPONSE

FIRE

Small Fire

- Use water. Do not use dry chemicals or foams. CO₂ or Halon® may provide limited control.

Large Fire

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.
- Do not get water inside containers: a violent reaction may occur.

Fire involving Tanks or Car/Trailer Loads

- Cool containers with flooding quantities of water until well after fire is out.
- Dike fire-control water for later disposal.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spill

- Flush area with flooding quantities of water.

Large Spill

- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

ERG Pages

Placard(s): 3108

GUIDE 145 ORGANIC PEROXIDES (HEAT AND CONTAMINATION SENSITIVE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from heat or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

ORGANIC PEROXIDES (HEAT AND CONTAMINATION SENSITIVE) GUIDE 145

EMERGENCY RESPONSE

FIRE

Small Fire

- Water spray or fog is preferred; if water not available use dry chemical, CO₂ or regular foam.

Large Fire

- Flood fire area with water from a distance.
- Use water spray or fog; do not use straight streams.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Keep substance wet using water spray.
- Stop leak if you can do it without risk.

Small Spill

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.

Large Spill

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- Remove material from skin immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

Placard(s): 3101

GUIDE 146 ORGANIC PEROXIDES
(HEAT, CONTAMINATION AND FRICTION SENSITIVE)

ORGANIC PEROXIDES **GUIDE 146**
(HEAT, CONTAMINATION AND FRICTION SENSITIVE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from heat, shock, friction or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

EMERGENCY RESPONSE

FIRE

Small Fire

- Water spray or fog is preferred; if water not available use dry chemical, CO₂ or regular foam.

Large Fire

- Flood fire area with water from a distance.
- Use water spray or fog; do not use straight streams.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Keep substance wet using water spray.
- Stop leak if you can do it without risk.

Small Spill

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.

Large Spill

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- Remove material from skin immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

ERG Pages

Placard(s): 3481

GUIDE LITHIUM ION BATTERIES 147

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150 °C (302 °F)), when damaged or abused (e.g., mechanical damage or electrical overcharging).
- May burn rapidly with flare-burning effect.
- May ignite other batteries in close proximity.

HEALTH

- Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Burning batteries may produce toxic hydrogen fluoride gas (see GUIDE 125).
- Fumes may cause dizziness or suffocation.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If rail car or trailer is involved in a fire, ISOLATE for 500 meters (1/3 mile) in all directions; also initiate evacuation including emergency responders for 500 meters (1/3 mile) in all directions.

LITHIUM ION BATTERIES GUIDE 147

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch or walk through spilled material.
- Absorb with earth, sand or other non-combustible material.
- Leaking batteries and contaminated absorbent material should be placed in metal containers.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

Placard(s): 2289, 2735, 3265, 3267, Corrosive, Poison

GUIDE 153 SUBSTANCES - TOXIC AND/OR CORROSIVE (COMBUSTIBLE)

POTENTIAL HAZARDS

HEALTH

- **TOXIC**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- Runoff may pollute waterways.
- Substance may be transported in a molten form.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

SUBSTANCES - TOXIC AND/OR CORROSIVE (COMBUSTIBLE) **GUIDE 153**

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, alcohol-resistant foam or water spray.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

ERG Pages

Placard(s): 1719, 1759, 1760, 1791, 1805, 1819, 1824, 1908, 2582, 2672, 2693, 2794, 2922, 3259, 3264, 3266

GUIDE 154 SUBSTANCES - TOXIC AND/OR CORROSIVE (NON-COMBUSTIBLE)

POTENTIAL HAZARDS

HEALTH

- **TOXIC;** inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.).
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- For electric vehicles or equipment, GUIDE 147 (lithium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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GUIDE 154 SUBSTANCES - TOXIC AND/OR CORROSIVE (NON-COMBUSTIBLE)

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, alcohol-resistant foam or water spray.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

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Placard(s): 1182

GUIDE 155 SUBSTANCES - TOXIC AND/OR CORROSIVE
(FLAMMABLE/WATER-SENSITIVE)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors form explosive mixtures with air; indoors, outdoors and sewers explosion hazards.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapors may travel to source of ignition and flash back.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.

HEALTH

- **TOXIC;** inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- **Bromoacetates and chloroacetates are extremely irritating/lachrymators.**
- Reaction with water or moist air will release toxic, corrosive or flammable gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

SUBSTANCES - TOXIC AND/OR CORROSIVE
(FLAMMABLE/WATER-SENSITIVE) **GUIDE 155**

EMERGENCY RESPONSE

FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.
- **CAUTION: For Acetyl chloride (UN1717), use CO₂ or dry chemical only.**
- **Small Fire**
- CO₂, dry chemical, dry sand, alcohol-resistant foam.
- **Large Fire**
- Water spray, fog or alcohol-resistant foam.
- **FOR CHLOROSILANES, DO NOT USE WATER;** use AFFF alcohol-resistant medium-expansion foam.
- Move containers from fire area if you can do it without risk.
- Use water spray or fog; do not use straight streams.
- **Fire involving Tanks or Car/Trailer Loads**
- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- A vapor-suppressing foam may be used to reduce vapors.
- **FOR CHLOROSILANES,** use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spill

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions Meters (Feet)		Then PROTECT persons Downwind during		First ISOLATE in all Directions Meters (Feet)		Then PROTECT persons Downwind during	
					DAY Kilometers (Miles)	NIGHT Kilometers (Miles)			DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1163	131	1,1-Dimethylhydrazine	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.3 mi)	100 m (300 ft)	1.0 km (0.6 mi)	1.8 km (1.1 mi)		
1163	131	Dimethylhydrazine, unsymmetrical								
1182	155	Ethyl chloroformate	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.3 km (0.2 mi)	0.5 km (0.3 mi)		
1183	139	Ethylchlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.2 mi)		
1185	131P	Ethyleneimine, stabilized	30 m (100 ft)	0.2 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	1.7 km (1.1 mi)		
1196	155	Ethyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.4 mi)	150 m (500 ft)	1.9 km (1.2 mi)	5.6 km (3.5 mi)		
1238	155	Methyl chloroformate	30 m (100 ft)	0.2 km (0.2 mi)	0.6 km (0.4 mi)	150 m (500 ft)	1.1 km (0.7 mi)	2.1 km (1.3 mi)		
1239	131	Methyl chloromethyl ether	60 m (200 ft)	0.5 km (0.3 mi)	1.4 km (0.9 mi)	300 m (1000 ft)	3.0 km (1.9 mi)	5.6 km (3.5 mi)		
1242	139	Methyldichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.7 km (0.5 mi)	2.2 km (1.4 mi)		
1244	131	Methylhydrazine	30 m (100 ft)	0.3 km (0.2 mi)	0.6 km (0.4 mi)	100 m (300 ft)	1.3 km (0.8 mi)	2.1 km (1.3 mi)		
1250	155	Methyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.8 km (0.5 mi)	2.4 km (1.5 mi)		
1251	131P	Methyl vinyl ketone, stabilized	100 m (300 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)	800 m (2500 ft)	1.5 km (0.9 mi)	2.6 km (1.6 mi)		
1259	131	Nickel carbonyl	100 m (300 ft)	1.4 km (0.9 mi)	4.9 km (3.0 mi)	1000 m (3000 ft)	11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)		
1295	139	Trichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.3 mi)		



Placard(s): 1710

GUIDE 160 HALOGENATED SOLVENTS

POTENTIAL HAZARDS

HEALTH

- Toxic by ingestion.
- Vapors may cause dizziness or suffocation.
- Exposure in an enclosed area may be very harmful.
- Contact may irritate or burn skin and eyes.
- Fire may produce irritating and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

- Some of these materials may burn, but none ignite readily.
- Most vapors are heavier than air.
- Air/vapor mixtures may explode when ignited.
- Container may explode in heat of fire.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer.
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

HALOGENATED SOLVENTS **GUIDE 160**

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, alcohol-resistant foam or water spray.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Stop leak if you can do it without risk.

Small Liquid Spill

- Pick up with sand, earth or other non-combustible absorbent material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Wash skin with soap and water.
- Keep victim calm and warm.

ERG Pages

Placard(s): 2916

GUIDE 163 RADIOACTIVE MATERIALS (LOW TO HIGH LEVEL RADIATION)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by shipping papers contain non-life-endangering amounts. Partial releases might be expected if "Type A" packages are damaged in moderately severe accidents.
- Type B packages, and the rarely occurring Type C packages (large and small, usually metal), contain the most hazardous amounts. They can be identified by package markings or by shipping papers. Life-threatening conditions may exist only if contents are released or package shielding fails. Because of design, evaluation and testing of packages, these conditions would be expected only for accidents of utmost severity.
- The rarely occurring "Special Arrangement" shipments may be of Type A, Type B or Type C packages. Package type will be marked on packages, and shipment details will be on shipping papers.
- Radioactive White-I labels indicate radiation levels outside single, isolated, undamaged packages are very low (less than 0.005 mSv/h (0.5 mrem/h)).
- Radioactive Yellow-II and Yellow-III labeled packages have higher radiation levels. The transport index (TI) on the label identifies the maximum radiation level in mrem/h one meter from a single, isolated, undamaged package.
- Some radioactive materials cannot be detected by commonly available instruments.
- Water from cargo fire control may cause pollution.

FIRE OR EXPLOSION

- Some of these materials may burn, but most do not ignite readily.
- Radioactivity does not change flammability or other properties of materials.
- Type B packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
 - Stay upwind, uphill and/or upstream.
 - Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection against internal radiation exposure, but not external radiation exposure.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

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RADIOACTIVE MATERIALS (LOW TO HIGH LEVEL RADIATION) GUIDE 163

EMERGENCY RESPONSE

FIRE

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- Move containers from fire area if you can do it without risk.
- Do not move damaged packages; move undamaged packages out of fire zone.

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog (flooding amounts).
- Dike fire-control water for later disposal.

SPILL OR LEAK

- Do not touch damaged packages or spilled material.
- Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. Most packaging for liquid content have inner containers and/or inner absorbent materials.
- Cover liquid spill with sand, earth or other non-combustible absorbent material.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

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Placard(s): 3077, 3082

GUIDE SUBSTANCES (LOW TO MODERATE HAZARD)
171

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Some may be transported hot.
- For UN3508, be aware of possible short circuiting as this product is transported in a charged state.

HEALTH

- Inhalation of material may be harmful.
- Contact may cause burns to skin and eyes.
- Inhalation of Asbestos dust may have a damaging effect on the lungs.
- Fire may produce irritating, corrosive and/or toxic gases.
- Some liquids produce vapors that may cause dizziness or suffocation.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

SUBSTANCES (LOW TO MODERATE HAZARD) GUIDE
171

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- Do not scatter spilled material with high-pressure water streams.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal.

Fire involving Tanks

- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent dust cloud.
- Avoid inhalation of asbestos dust.

Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

Small Spill

- Pick up with sand or other non-combustible absorbent material and place into containers for later disposal.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Cover powder spill with plastic sheet or tarp to minimize spreading.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.