New Hampshire Hazardous Materials Commodity Flow Study

Southeastern New Hampshire Hazardous Materials Mutual Aid District
Central New Hampshire Regional Emergency Planning Committee
September 2016

Executive Summary

The Central New Hampshire and the Southeastern New Hampshire Hazardous Materials District Regional Emergency Planning Committees, with funding support from a Hazardous Materials Emergency Preparedness Grant, conducted this Hazardous Materials Commodity Flow Study. The purpose of the study was to provide an understanding of the types and quantities of hazardous materials traveling within the State of New Hampshire. This information gathered in this study will provide the Regional and Local Emergency Planning Committees the ability to develop response plans as well as identifying the equipment and training needs of the Regional Hazardous Materials Response Teams.

Priority Hazardous Materials

The primary focus of this study were products likely to include toxic airborne substances, corrosives, flammable and toxic products and products likely to cause significant environmental damage if allowed to access environmental receptors such as ground water. Table1 lists these chemicals with total annual volume by County.

Table 1: Chemicals of Concern identified within the Transport Road Segments of this study in Aggregate Amounts of EHS, Transported by County in Pounds in 2015

Chemical	Belknap	Grafton	Hillsborough	Merrimack	Rockingham
Ammonia (Aqua)		37,700			1,119,000
Ammonia (Anhydrous)	3,000	16,600	33,460,982	4,294,750	183,799
Chlorine			4,992,000	12,900	134,120
CNG		27,609,920			
Cyanides	3,600	4,220	1,420		250
Hydrochloric Acid			4,277		942
Hydrofluoric Acid			1,000,082		14,487
Methanol		4,050,542	1,400	12,000	63,000
Nitric Acid	179,200	226,716	9,169,971	18,916	32,590
Phenol		5	120,000	6,394,109	20
Sodium Hydroxide	261,120	422,162	6,480	613,100	1,505,140
Sulfuric Acid	192,000	1,149,237	14,207,912	80,430	1,917,990

Data Sources

Information was gathered through a multitude of data sources including Tier 2 Chemical Inventory Reports, which is data that is required to be submitted to the Local, State and Emergency Planning Committees via the SARA Title III Emergency Planning and Community Right to Know Act of 1986, as well as 2010 US Census Data, CAMEO, CAMEO Chemicals, 2016 Emergency Response Guide Book and various Graphic Information System (GIS) layers. Several visual surveys of truck placards and truck container size were conducted during 2015 on multiple highway road segments.

Road Segments

The study focused on multiple interstate highway segments within the State of New Hampshire. The selection of these transportation road segments was made due to the known hazardous materials being transported upon them. Inclusive of the vehicular visual surveys and Tier 2 reports from facilities indicating which road segments the products are in transit provided direction to the participants to focus on specific road segments.

Hazard Receptors

Hazard Receptors are special populations comprised of anyone who may require special consideration to be appropriately protected during a hazardous materials release. For this study the following hazard receptors were selected: Hospitals, Nursing Homes, Educational Facilities, Places of Worship and Daycares.

Sensitive Environmental Receptors

Sensitive Environmental Receptors were another important focus area of this study. By utilizing New Hampshire Department of Environmental Services One Stop GIS data sets, the study was able to identify sensitive environmental receptors such as well heads, wells, water intakes, drainage areas and streams among others within the transportation route buffer. For this study the following sensitive environmental receptors were selected: Streams and Runoff, Water Bodies, Public Water Supply Wells, Wellhead Protection Areas and Water Supply Intake Protection Zones.

Isolation and Planning Buffer Maps

Isolation and planning buffer maps were developed for each of the nine road segments. Maps were created based on the downwind protection distances from the North American Emergency Response Guidebook. There are five maps for each road segment ranging from a 1/4-mile spill buffer to 5-mile air borne chemical release buffer.

Recommendations

As a result of this study several recommendations have been made for improving the planning for and response to hazardous materials emergencies including;

- More clearly defined coverage areas for Regional Emergency Planning Committees (REPC) and the establishment of goals for those committees.
- Local/Regional Emergency Planning Districts and community Emergency Management Directors should work closely with facilities that store, transport and use hazardous materials, to identify chemicals which could possess a risk to susceptible populations and first responders. Attention should be focused on Extremely Hazardous Substances and airborne toxics such as Ammonia and Chlorine.
- Local First Responders should be familiar with and tour facilities which store, transport and use hazardous materials at least annually to become familiar with the hazards, facility operations and protocols.
- Effective plans should be drafted for recognized Local and or Regional Emergency Planning Committees (L/REPC) which focus on defining roles and responsibilities and also identify facilities and transportation routes in harmony with the Emergency Planning and Community Right to Know Act.
- Planning for evacuation and shelter in place should focus on specific facilities which could pose a significant hazard to the local community if hazardous materials are released into the atmosphere.

Table of Contents

Introduction

The transportation of hazardous materials, by one mode or another, is present in nearly every community. The vast majority of hazmat shipments move safely and securely along the nation's transportation system. However, the threat of a hazmat transportation incident remains significant, with an average of at least two incidents per hour, or more than 50 per day, nationally.

Incidents can occur in any jurisdiction at almost any time. Human behavior and technological failure cause many system failures or casualties. The consequences of hazmat incidents are potentially catastrophic to public safety, life and wellbeing, the environment, and infrastructure. This raises concern regarding the transportation of hazardous materials through populated or environmentally sensitive areas.

The objective of a Commodity Flow Survey is to collect data which can be analyzed to provide clear images, over time, of the types and amounts of hazardous materials shipments moving past a point along a transportation corridor. The information produced by such a survey can be an indispensable tool in helping emergency planners understand and identify the planning, training, and resource requirements needed to effectively respond to a transportation incident involving hazardous materials.

The hazardous materials commodity flow study is an assessment of the types and volumes of hazardous materials moving throughout the State of New Hampshire. The execution of this Commodity Flow Study was granted to the Central New Hampshire Regional Emergency Planning Committee and the South East New Hampshire Emergency Planning Committee and supported by a federal grant from the Department of Transportation Hazardous Materials Emergency Performance Grant (HMEP). This study is a continuation of the draft study submitted by the CNHREPC, SENHREPC and City of Nashua LEPC in 2015 to identify, quantify, and provide guidance for Local, Regional and State planners to prepare adequate Hazardous Materials Emergency Response Plans for the State of New Hampshire. This study is formed with guidance from the "Guidebook for Conducting Local Hazardous Materials Commodity Flow Studies,2011.

The Central New Hampshire Hazardous Materials Team and the Southeastern New Hampshire Hazardous Materials Mutual Aid District jointly conducted a commodity flow study that incorporated the counties of Rockingham, Hillsborough, Belknap, Merrimack and Grafton. The study provided a perception of the of the types and quantities of hazardous materials traveling within the State of New Hampshire and will provide the information needed for the Regional and Local Emergency Planning Committees to develop response plans, as well as identify the equipment and training needs of the Regional Hazardous Materials Response Teams. In the Emergency Planning and Community Right-to-Know Act (EPCRA), Congress recognized the risk to communities posed by the transportation of hazardous materials and required that emergency response plans developed by the Local Emergency Planning Committee (LEPC) identify the "routes likely to be used for the transportation of substances on the list of extremely hazardous substances"

Participating Agencies

Central New Hampshire Hazmat Team

Southeastern New Hampshire Hazardous Materials Mutual Aid District

City of Nashua Local Emergency Planning Committee

Methodology

The Commodity Flow Study is the hazards identification step of the transportation hazards analysis. This study was crafted with the best data sources available to the participating agencies. By a combination of qualitative and quantitative information sources, data was collected to provide the information and recommendations in this study. These findings and recommendations should drive discussion, planning and actions from all interested and responsible parties in the State of New Hampshire. The end goal is to improve planning, response preparation, training and exercising, which focus on known transportation hazards that are present in the State of New Hampshire.

Data sources which provide quantitative information consist of Geographic Information System layers, 2010 US Census Data, CAMEO, CAMEO Chemicals, 2016 Emergency Response Guide Book and Tier 2 hazardous materials facility reports, which is data that is required to be submitted to the Local, State and Emergency Planning Committees via the SARA Title III Emergency Planning and Community Right to Know Act of 1986.

Visual surveys of truck placards and truck container size conducted during 2015 of multiple highway road segments and local known information sources from the participants provide the qualitative information to support the selection of the chemicals of most significance being transported within the State of New Hampshire.

Project Phases

The first phase of this project was to establish goals and objectives for the study. Given the limited time frame which was available to complete the study it was decided that the focus of the study would be data collection and preparing a draft report. This was completed in September 2015. The second phase of the study was to finalize the report and identify chemical transportation hazards and vulnerable populations for future planning.

Both the Southeastern NH REPC and the Central NH REPC worked in conjunction as the lead agencies for the management this study. As the REPCs are responsible for hazardous materials planning within their designated areas, all of the stakeholders considered necessary in the preparation, prevention and response to hazardous materials release emergencies were represented including public officials, businesses and other entities that either transport or handle hazardous materials or respond to incidents. Residents living near hazardous material travel routes and facilities should understand the risks and be prepared should a release occur.

Due to the demographics of the State of NH the amount of susceptible populations decreases the further north you travel. Although the populations decrease, other significant sensitive environmental receptors exist. The task is to identify the amounts and locations of these susceptible populations and environmental receptors which are at risk during a release of a hazardous material in transportation. Both the NH Granite and the NH DES map layers where used to identify vulnerable populations and environmentally sensitive areas.

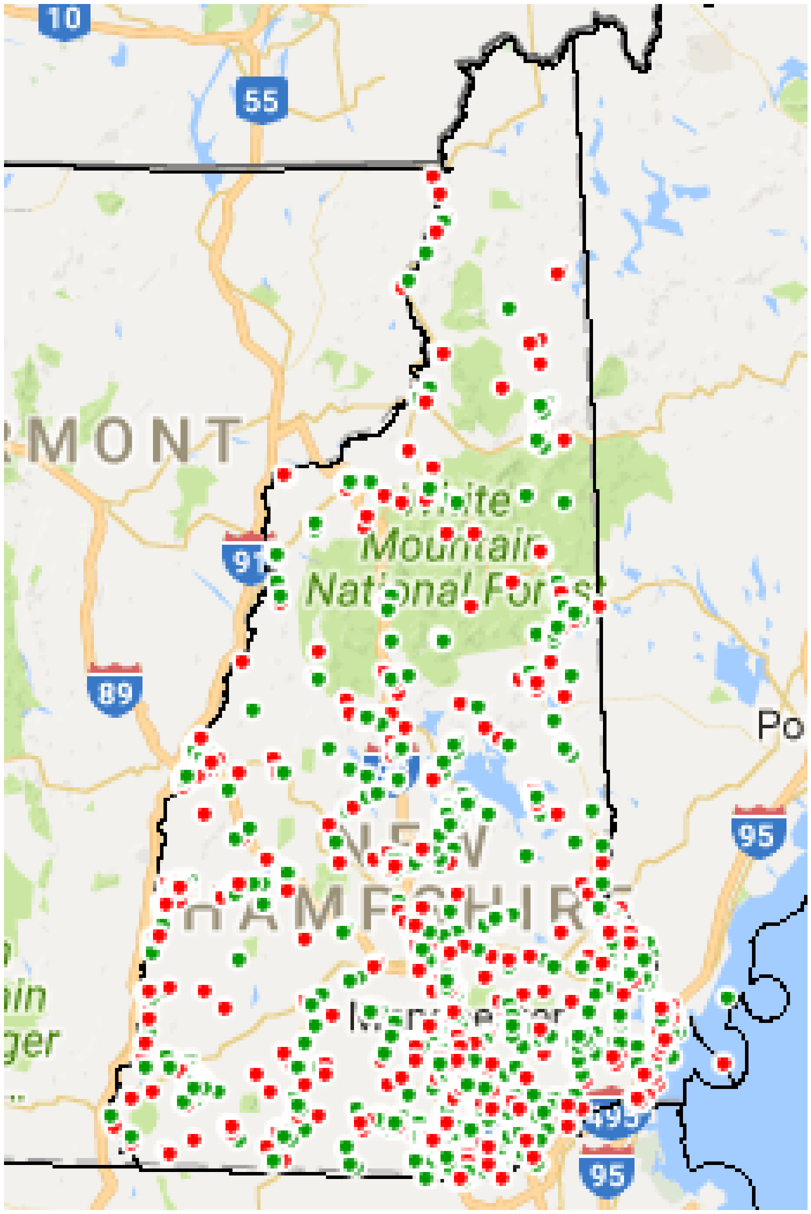
CAMEO chemicals and the 2016 ERG were used to develop the chemical data sheets and establish the criteria for the five buffer zones. The buffer zones are based on the Protective Action Distances for toxic inhalation gases from the 2016 ERG.

Hazardous Materials Facilities

The focus of the study was on chemicals classified by the Environmental Protection Agency (EPA) as Extremely Hazardous Substances (EHS). The Tier II data was reviewed to identify the frequency and volumes of these shipments. Within the Tier II database for facilities is an identification of which transportation route the facility receives or delivers the shipments from. This section of the Tier II report included vital information to assist in the completion of this study.

For the Tier II reporting year 2015, there were 1494 facilities that reported chemicals in storage in New Hampshire. Out of the 1494 facilities reporting, 650 reported storage of EHS chemicals. (Fig. 1)Several facilities’ transportation route information was incomplete or missing totally. Currently is this not a required field in New Hampshire. As such the information in this field is often missing, limited or incomplete. The Hazardous Materials Sub-Committee of the State Emergency Response Commission (SERC) voted rin September 2015 to recommend that this become a required entry stating with reporting year 2015. At this time this change has not been implemented fully.

Figure 1: Map of EHS and Non EHS facilities in NH Tier 2 reporting year 2015



Red EHS Facilities (650)

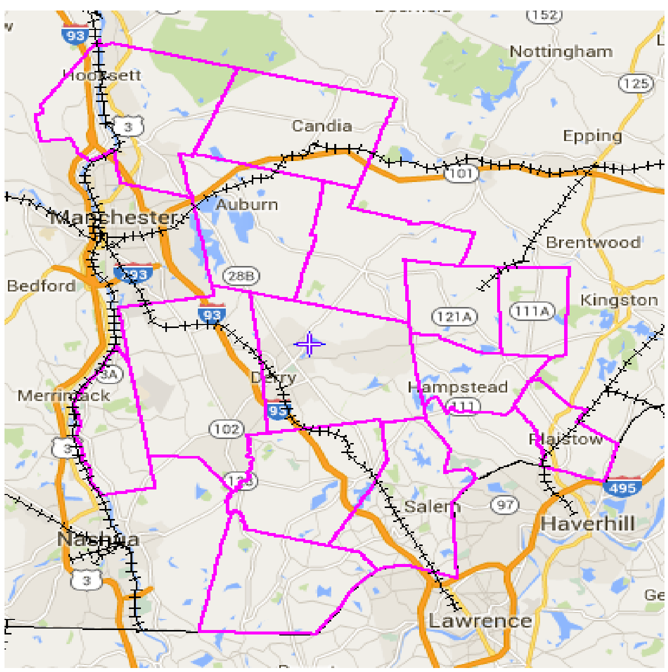
Green Non-EHS Facilities (844)

Regional Overview: Southeastern New Hampshire Hazardous Materials Mutual Aid District (SENHHMMAD)

The Southeastern New Hampshire Hazardous Materials Mutual Aid District (SENHHMMAD) consists of 14 member communities that constitute a recognized legal entity that provides hazardous materials planning and response to its member communities.

The District is located along the Route 93 corridor from the Massachusetts state line to the Hooksett area. This political subdivision has been in existence since 1992, and serves a population of 180,000 citizens covering over 350 square miles of geography in the southern part of the state. Under the EPA's Emergency Planning and Right to Know Act (EPCRA), the District is recognized by the State of New Hampshire Advisory Council on Emergency Preparedness and Security (ACEPS), as the Regional Emergency Planning Committee (REPC) for our 14 member communities.

Within the District are several major public drinking water sources including Massabesic Lake, Canobie Lake and the Merrimack River. This area is considered one of the fastest growth regions within the State of New Hampshire. There are 195 facilities located within the District that submitted Tier 2 reports for 2015, 76 of those reported having Extremely Hazardous Substances (EHS).



Regional Overview: Central NH Regional Emergency Planning Committee (CNHREPC)

The CNHREPC officially covers 54 communities located in the Central portion of the State of New Hampshire. The area is bordered on the South by the Town of Allenstown, to the North by the Town of Waterville Valley, to the East to the town of Northwood and to the West to the Town of Bradford. The total geographic area is approximately 1500 square miles, having topography of rolling hills and steadily increasing elevation to major mountainous regions. The Pemigewasset, Winnipesauke, Winnisquam and Merrimack River basin areas cut the region in half north to south.

The population served is in excess of 233,000 people in a combination of a rural and suburban setting. The overall population density is 141 people per square mile. The majority of the communities are located in the Merrimack and Belknap Counties with the remaining populations residing in portions of Rockingham, Grafton, Carroll and Strafford Counties. The following communities are officially recognized as members of the Central NH Regional Emergency Planning Committee:

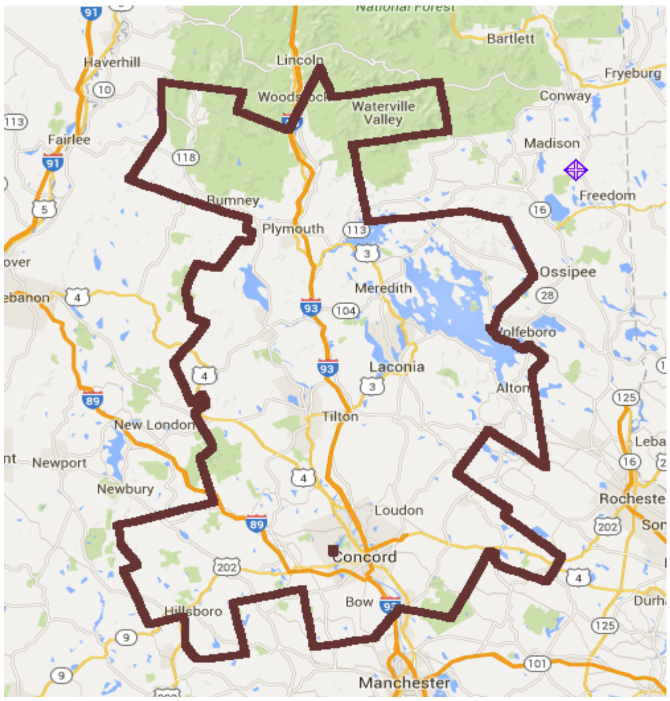
Alexandria, Ashland, Barnstead, Belmont, Bristol, Boscawen, Bow, Bradford, Campton, Canterbury, Center Harbor, Concord, Dunbarton, Ellsworth, Epsom, Franklin, Gilford, Hebron, Hill, Holderness, Hopkinton, Laconia, Loudon, Meredith, Northwood, Pembroke, Pittsfield, Plymouth, Rumney, Salisbury, Sanbornton, Thornton, Tilton/Northfield, Alton, Andover, Bridgewater, Danbury, Gilmanton, Moultonborough, New Hampton, Sandwich, Strafford, Waterville Valley, Warren, Wentworth, Allenstown, Warner, Hillsborough, Deering, Henniker, Webster, Chichester.

The CNHREPC is formed along a combined boundary of two fire mutual aid districts (Capital Area Mutual Aid Fire Compact and Lakes Region Mutual Fire Aid Association) which by fact of NH RSA 53:A-3 has created a joint venture agreement to oversee and support the operations of the Central NH Hazmat Team. As such the lead agency for Emergency Technician Level Hazardous Materials Response within the CNHREPC will be the Central New Hampshire Hazmat Team.

Light to medium industry and manufacturing are found primarily in the corridor along Interstate Route 93, and 89 along with routes 3, 28, and 106 which are many of the primary and secondary transportation routes North and South in the State of New Hampshire. In addition the area is bisected east and west by routes 4, 104 and 393.

The Central NH Region is a significant tourist destination with many sensitive environmental areas. Located within the REPC is the Capital of NH, Concord. Being the seat of Federal, State, County Judicial and Administrative agencies, the NH State House and Legislature are a consistent presence within the region. The amount of visitors to the region swells local numbers by significant amounts every season and during major large scale events such as NASCAR, Bike Week and many others.

Newer forms of product dispersion such as compressed natural gas trucking and trans-loading of Propane are becoming more prevalent. Guilford and Pan Am Rail Service has major rights of ways providing rail transportation coming from the south, via Massachusetts to the Concord area. Identifying potential impacts to ground and surface water drinking supplies with identified transport routes is an important goal of the CNH REPC.



CNHREPC Transport Routes

The Central NH region is bisected by Interstate 93 and 89, which are a major focus of this transport study. Routes 4, 106, 104, 11, 3, 3A, 28 all transect the REPC coverage area with a variety of chemicals in the region being moved throughout. A large amount of products are known to utilize the major interstate highways in New Hampshire, and the data being collected will provide very useful information to further study and plan for events in New Hampshire involving hazardous materials.

SENHHMMAD Transportation Routes

Located within the Southeastern NH Hazardous Materials Mutual Aid District are approximately 30 miles of Interstate Route 93, State Route 28 and State Route 3A, some of the State's major north/south travel routes, as well as State Route 111, State Route 101, and State Route 102, the major east/west travel routes. Also within the District is the Manchester-Boston Regional Airport. The District also has two rail lines that serve New Hampshire and Maine with both freight and passenger service.

Priority Hazardous Materials

Nearly all communities within New Hampshire have flows of fuels to include gasoline, diesel, propane, kerosene, and heating oil among many others. The focus of this study does not include these common fuels as they are a well-known consistent risk of differing levels to our communities.

The primary focus of this study is products that are not general fuels, and likely to include toxic airborne substances, corrosives, flammable and toxic products and products likely to cause significant environmental damage if allowed to access environmental receptors such as ground water.

Table 1: Chemicals of Concern identified within the Transport Road Segments of this study in Aggregate Amounts of EHS, Transported by County in Pounds in 2015

Chemical	Belknap	Grafton	Hillsborough	Merrimack	Rockingham
Ammonia (Aqua)		37,700			1,119,000
Ammonia (Anhydrous)	3,000	16,600	33,460,982	4,294,750	183,799
Chlorine			4,992,000	12,900	134,120
CNG		27,609,920			
Cyanides	3,600	4,220	1,420		250
Hydrochloric Acid			4,277		942
Hydrofluoric Acid			1,000,082		14,487
Methanol		4,050,542	1,400	12,000	63,000
Nitric Acid	179,200	226,716	9,169,971	18,916	32,590
Phenol		5	120,000	6,394,109	20
Sodium Hydroxide	261,120	422,162	6,480	613,100	1,505,140
Sulfuric Acid	192,000	1,149,237	14,207,912	80,430	1,917,990

Anhydrous Ammonia was noted as being the largest quantity product transported within the State of New Hampshire at 37.9 million pounds. It is to be noted that a large majority of that product is being transported via rail. This should not be discredited, as the rail lines within the state are of major concern for planners, and more needs to be done on behalf of rail response planning for hazardous materials as the rail lines transect large population bases with the southern half of the State.

Within this study, it was apparent that Sulfuric Acid at 17.5 million pounds is the 2nd largest quantity product transported in the State of New Hampshire outside of fuels. This information is not a surprise, but the hazard of this product cannot be underestimated as it is very reactive and corrosive. This quantity does not include the millions of batteries within the State of New Hampshire.

Many other corrosive products are transported within the State of New Hampshire and second to common fuels, corrosives were noted as being the most observed placarded vehicles in the vehicle survey.

Once the identification of products via visual surveys and Tier 2 data sources was completed, along with road transport segments which the products are transported along were identified, this gives the planners the ability to conduct risk assessments.

Risk assessments are a judgment made by the planners based on some of the following criteria.

- Likelihood of accidental release, based on various factors such as the history of releases at fixed facilities and in transport, current conditions and controls at facilities, unusual environmental conditions, and the possibility of simultaneous emergency incidents (such as flooding or fire) resulting in the release of hazardous chemicals, and

- Severity of consequences – the people, places, and things located within the buffer zone. Risk analysis does not require extensive mathematical analysis (although probabilistic risk analysis can provide valuable information to community planners), but instead relies on the knowledge, experience, and common sense of local planners and responders using data gained from hazards identification and vulnerability analysis.

CAMEO Chemicals was utilized extensively in this study as it is an excellent source of chemical, physical, toxicological, thermodynamic, and response information for thousands of chemicals. It provides very specific information about cargos, such as, boiling points, density, or exposure levels.

AMMONIA, ANHYDROUS

Chemical Identifiers

CAS Number	UN/NA Number	DOT Hazard Label
7664-41-7	1005	Non-Flammable Gas (domestic) Inhalation Hazard (Special Provision 13) (domestic) Poison Gas (international) Corrosive (international)

General Description

A clear colorless gas with a strong odor. Shipped as a liquid under its own vapor pressure. Density (liquid) 6 lb / gal. Contact with the unconfined liquid can cause frostbite. Gas generally regarded as nonflammable but does burn within certain vapor concentration limits and with strong ignition. Fire hazard increases in the presence of oil or other combustible materials. Although gas is lighter than air, vapors from a leak initially hug the ground. Prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations has adverse health effects. Used as a fertilizer, as a refrigerant, and in the manufacture of other chemicals. Source/use/other hazard: Explosives manufacture; pesticides; detergents industry.

Hazards

Health Hazard

Vapors cause irritation of eyes and respiratory tract. Liquid will burn skin and eyes. Poisonous; may be fatal if inhaled. Contact may cause burns to skin and eyes. Contact with liquid may cause frostbite. (EPA, 1998)

Fire Hazard

Mixing of ammonia with several chemicals can cause severe fire hazards and/or explosions. Ammonia in container may explode in heat of fire. Incompatible with many materials including silver and gold salts, halogens, alkali metals, nitrogen trichloride, potassium chlorate, chromyl chloride, oxygen halides, acid vapors, azides, ethylene oxide, picric acid and many other chemicals. Mixing with other chemicals and water. Hazardous polymerization may not occur. (EPA, 1998)

Reactivity Profile

AMMONIA is a base. Reacts exothermically with all acids. Violent reactions are possible. Readily combines with silver oxide or mercury to form compounds that explode on contact with halogens. When in contact with chlorates it forms explosive ammonium chlorate [Kirk-Othmer, 3rd ed., Vol. 2, 1978, p. 470]. Reacts violently or produces explosive products with fluorine, chlorine, bromine and iodine and some of the interhalogen compounds (bromine pentafluoride, chlorine trifluoride).

Transportation Information: Anhydrous Ammonia is the most prevalent significant toxic airborne hazard that exists in the State of NH. There were 45 Facilities in New Hampshire that reported on site Anhydrous Ammonia. These facilities are primarily refrigeration based systems but there are several users who receive frequent, large quantity deliveries of Anhydrous Ammonia which could cause significant harm to susceptible populations. **The total amount of Anhydrous Ammonia shipped within the focus area of this study is 37.9 million pounds per year.**

Response Recommendations

Isolation and Evacuation

As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. SPILL: Per the ERG Tables 1 and 3 - Initial Isolation and Protective Action Distances on the UN/NA 1005 datasheet. **Isolation buffers for Ammonia fall within the ½ Mile and 1 Mile transportation buffers as noted in Table 3 for Highway Tank Truck or Trailer releases.**

ERG Table 3: Initial Isolation and Protective Action Distances for Different Quantities of Six Common Toxic-by-Inhalation Gases

UN1005 Ammonia, anhydrous: Large Spills							
	First **Isolate** in all Directions	Then **Protect** persons Downwind during					
		Day			**Night**		
Transport Container	(Feet)	**Low Wind** (<6 mph) (Miles)	**Moderate Wind** (6-12 mph) (Miles)	**High Wind** (>12 mph) (Miles)	**Low Wind** (<6 mph) (Miles)	**Moderate Wind** (6-12 mph) (Miles)	**High Wind** (>12 mph) (Miles)
Rail tank car	1000	1.1	0.8	0.6	2.7	1.4	0.8
Highway tank truck or trailer	500	**0.6**	**0.3**	**0.3**	**1.3**	**0.5**	**0.4**
Agricultural nurse tank	200	0.3	0.2	0.2	0.8	0.2	0.2
Multiple small cylinders	100	0.2	0.1	0.1	0.5	0.2	0.1

CHLORINE

Chemical Identifiers

CAS Number	UN/NA Number	DOT Hazard Label
7782-50-5	1017	Poison Gas
		Oxidizer
		Corrosive

General Description

A greenish yellow gas with a pungent suffocating odor. Toxic by inhalation. Slightly soluble in water. Contact with unconfined liquid can cause frostbite by evaporative cooling. Does not burn but, like oxygen, supports combustion. Long-term inhalation of low concentrations or short-term inhalation of high concentrations has ill effects. Vapors are much heavier than air and tend to settle in low areas. Used to purify water, bleach wood pulp, and to make other chemicals.
Cleaner/disinfectant in many industries; water treatment; WWI war gas; irritating corrosive fumes heavier than air.

Fire Hazard

May ignite other combustible materials (wood, paper, oil, etc.). Mixture with fuels may cause explosion. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. Hydrogen and chlorine mixtures (5-95%) are exploded by almost any form of energy (heat, sunlight, sparks, etc.). May combine with water or steam to produce toxic and corrosive fumes of hydrochloric acid. Emits highly toxic fumes when heated. Avoid plastics and rubber. Avoid heat and contact with hydrogen gas or powdered metals. (EPA, 1998)

Health Hazard

Poisonous; may be fatal if inhaled. Contact may cause burns to skin and eyes. Bronchitis or chronic lung conditions. (EPA, 1998)

Reactivity Profile

CHLORINE reacts explosively with or supports the burning of numerous common materials.

Transportation

Of the 5 facilities which reported the storage of Chlorine Gas on site in New Hampshire, all are within this transport study focus area. The significant amount of Chlorine Gas shipped into Hillsborough County via rail to Jones Chemical Inc. (JCI) is a major concern. The vast majority of Chlorine gas is brought to this facility to create Hypochlorite solutions for the water treatment plants in the New England Area. JCI is also designated as a Critical Infrastructure within the State of NH for the hypochlorite solutions for the water treatment plants. JCI reports that it utilizes all major highways in the State of NH, and thus every road segment that was studied will include a 1 mile and 5 mile layer for Chlorine for protections of susceptible populations. JCI notwithstanding, other Industrial applications for Chlorine exist, many smaller cylinders are prevalent in the state on all the major highways. The total amount of Chlorine shipped within the State of NH is reported to be in excess of 5 million pounds, vast majority of that product to JCI.

Isolation and Evacuation

Excerpt from GUIDE 124 [Gases - Toxic and/or Corrosive - Oxidizing]: As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.

SPILL: From ERG Tables 1 and 3 - Initial Isolation and Protective Action Distances on the UN/NA 1017 datasheet. **Chlorine falls in the 1 mile and 5 mile buffer areas that were created due to the hazards presented by this product and the known transport containers reported in this study.**

ERG Table 3: Initial Isolation and Protective Action Distances for Different Quantities of Six Common Toxic-by-Inhalation Gases

UN1017 Chlorine: Large Spills							
	First **Isolate** in all Directions (Feet)	Then **Protect** persons Downwind during					
		Day			**Night**		
Transport Container		**Low Wind** (<6 mph) (Miles)	**Moderate Wind** (6-12 mph) (Miles)	**High Wind** (>12 mph) (Miles)	**Low Wind** (<6 mph) (Miles)	**Moderate Wind** (6-12 mph) (Miles)	**High Wind** (>12 mph) (Miles)
Rail tank car	3000	6.2	4.0	3.2	7+	5.6	4.2
Highway tank truck or trailer	2000	3.6	2.1	1.8	4.3	3.1	2.5
Multiple ton cylinders	1000	1.3	0.8	0.6	2.5	1.5	0.8
Multiple small cylinders or single ton cylinder	500	0.9	0.5	0.3	1.8	0.8	0.4

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

NATURAL GAS, [COMPRESSED]

CAS Number	UN/NA Number	DOT Hazard Label
74-82-8	1971	Flammable Gas

General Description

A flammable gaseous mixture of straight chain hydrocarbons, predominately compressed methane. Highly flammable.

Fire Hazard

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. 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. (ERG, 2016)

Health Hazard

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. (ERG, 2016)

Isolation and Evacuation

As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
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.

Firefighting

Excerpt from GUIDE 115 [Gases - Flammable (Including Refrigerated Liquids)]:
DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. CAUTION:

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. (ERG, 2016)

Transportation Profile

Compressed Natural Gas (CNG), is a rapidly growing industry within New Hampshire and New England. New Hampshire recently saw the installation of a CNG compressor station in the Central NH Region. This compressor station fills CNG trailers to be used as portable temporary storage at facilities desiring the low cost of Natural Gas, where underground utilities do not exist, instead of Oil. As the amount of facilities increase, so does the amount of vehicular trailer traffic.
New Hampshire has seen one highway accident in 2014 with this new style CNG trailer. Efforts to ensure communities are ready for this new type of trailer are underway. **In 2015 over 27 million pounds of CNG were transported over New Hampshire Highways and this number is increasing rapidly.**

CYANIDE SOLUTION: POTASSIUM &SODIUM

CAS Number	**UN/NA Number**	**DOT Hazard Label**
57-12-5	1935	Poison

General Description

Aqueous solutions with a faint odor of bitter almonds. Toxic by skin absorption, by ingestion, and inhalation of the hydrogen cyanide from the decomposition of the material. Toxic oxides of nitrogen are produced in fires involving this material.

Air & Water Reactions

Water soluble. Inorganic cyanides react slowly with water to evolve gaseous hydrogen cyanide (HCN).

Fire Hazard

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.. Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Substance may react with water (some violently), releasing corrosive and/or toxic gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. (ERG, 2016)

Health Hazard

TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death. Reaction with water or moist air may 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. (ERG, 2016)

Reactivity Profile

CYANIDE SOLUTIONS slowly evolve hydrogen cyanide, a flammable and poisonous gas. Acids cause the rapid evolution of HCN. Carbon dioxide from the air is sufficiently acidic to liberate HCN from solutions of cyanides. Incompatible with isocyanates, nitrides, and peroxides. Mayinitiate polymerization reactions of epoxides. May react exothermically with metal salts to produce explosive products or evolve gaseous hydrogen.

Isolation and Evacuation

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.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown above.

Transportation Profile

Potassium and Sodium Cyanide are the two predominant cyanide solutions noted being transported to and from facilities within New Hampshire. There are 8 facilities in the state that report a cyanide product. The concern with these products are if they are spilled, and find their way into the environment significant damages could occur. These compounds are very toxic and water soluble. **There was reported nearly 10,000 lbs of these products were used and transported in the study area in 2015.** There are likely many smaller quantity amounts that do not meet reporting thresholds that were not captured. **The ¼ mile spill transport layer was used to identify sensitive environmental and water supply areas to assist planners with their efforts.**

HYDROCHLORIC ACID, SOLUTION

CAS Number	UN/NA Number	DOT Hazard Label
7647-01-0	1789	Corrosive

General Description

Colorless watery liquid with a sharp, irritating odor. Consists of hydrogen chloride, a gas, dissolved in water. Sinks and mixes with water. Produces irritating vapor. (USCG, 1999) Aqueous hydrochloric acid has many uses as a strong inorganic acid: manufacture of chlorides, dissolution of minerals, pickling and etching of metals, regeneration of ion-exchange resins for water treatment, neutralization of alkaline products or waste materials, acidification of brine in chlor-alkali electrolysis, and many others.

(WISER for Windows Version 4.6.12, Database Version 4.6.3, HHS/NIH)

Water Reactions

An aqueous solution. Dilution may generate heat. Fumes in air.

Fire Hazard

Special Hazards of Combustion Products: Toxic and irritating vapors are generated when heated. (USCG, 1999)

Health Hazard

Inhalation of fumes results in coughing and choking sensation, and irritation of nose and lungs. Liquid causes burns. (USCG, 1999)

Reactivity Profile

HYDROCHLORIC ACID is an aqueous solution of hydrogen chloride, an acidic gas. Reacts exothermically with organic bases and inorganic bases. Reacts exothermically with carbonates (including limestone and building materials containing limestone) and hydrogen carbonates to generate carbon dioxide. Reacts with sulfides, carbides, borides, and phosphides to generate toxic or flammable gases. Reacts with many metals (including aluminum, zinc, calcium, magnesium, iron, tin and all of the alkali metals) to generate flammable hydrogen gas. Mixtures with concentrated sulfuric acid can evolve toxic hydrogen chloride gas at a dangerous rate. Undergoes a very energetic reaction with calcium phosphide [Mellor 8:841(1946-1947)].

Transportation Profile

Hydrochloric acid is used widely in the State of NH. There were 13 facilities which reported the storage and use of hydrochloric acid within NH in 2015. With New Hampshire's varied industries to include power generation stations, Hydrochloric Acid is a product which is widely used. **For the reporting year 2015, facilities reported to have stored or transported 97,3219 lbs. of Hydrochloric Acid within the state of NH.**

Isolation and Evacuation

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.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown above.

For transportation layers related to Hydrochloric Acid, the ¼ mile spill layer should be referenced to any potential impact to ground and water sites.

HYDROFLUORIC ACID, SOLUTION

CAS Number	UN/NA Number	DOT Hazard Label
7664-39-3	1790	Corrosive
		Poison

General Description

A colorless fuming mobile aqueous solution with a pungent odor. Corrosive to metals and tissue. Highly toxic by ingestion and inhalation. Exposure to fumes or very short contact with liquid may cause severe painful burns; penetrates skin to cause deep-seated ulceration that may lead to gangrene.

Air & Water Reactions

Fumes in air. Fumes are highly irritating, corrosive, and poisonous. Generates much heat on dissolution. Heat can cause spattering, fuming, etc.

Fire Hazard

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Substance may react with water (some violently), releasing corrosive and/or toxic gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. (ERG, 2016)

Health Hazard

TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death. Reaction with water or moist air may 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. (ERG, 2016)

Reactivity Profile

HYDROFLUORIC ACID attacks glass and any other silica containing material. May react with common metals (iron, steel) to generate flammable hydrogen gas if diluted below 65%.

Isolation and Evacuation

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.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown above.
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. (ERG, 2016)

Transportation Profile

Hydroflouric Acid is a widely used solution within the manufacturing facilities in New Hampshire. Its primary use is in etching and fine cleaning of precision metallic parts. A facility in southern Hillsborough County transports a large amount of Hydroflouric Acid for use within the State of NH. Each of these shipments are typically small, but due to the extreme hazard this product presents, more should be known of this product in the State. **In 2015 the reported amount of Hydroflouric Acid transported within New Hampshire was over a million pounds. The ¼ mile spill transport layer to identify potential sensitive environmental receptors and water supplies is the layer related to this product within New Hampshire.**

METHANOL

CAS Number	UN/NA Number	DOT Hazard Label
67-56-1	1230	Flammable Liquid
		Poison (international)

General Description

A colorless fairly volatile liquid with a faintly sweet pungent odor like that of ethyl alcohol. Completely mixes with water. The vapors are slightly heavier than air and may travel some distance to a source of ignition and flash back. Any accumulation of vapors in confined spaces, such as buildings or sewers, may explode if ignited. Used to make chemicals, to remove water from automotive and aviation fuels, as a solvent for paints and plastics, and as an ingredient in a wide variety of products.

Fire Hazard

Behavior in Fire: Containers may explode. (USCG, 1999)

Health Hazard

Exposure to excessive vapor causes eye irritation, head- ache, fatigue and drowsiness. High concentrations can produce central nervous system depression and optic nerve damage. 50,000 ppm will probably cause death in 1 to 2 hrs. Can be absorbed through skin. Swallowing may cause death or eye damage. (USCG, 1999)

Isolation and Evacuation

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown above.
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. (ERG, 2016)

Transportation Profile

Ethanol and Methanol are Alcohols. However, unlike ethanol, methanol is highly toxic and unfit for consumption. At room temperature, it is a polar liquid, and is used as an **antifreeze**, solvent, fuel, and as a denaturant for ethanol. It is also used for producing biodiesel. **Given its solubility in water, Methanol falls within the ¼ mile spill transportation layer.** This layer provides an indication of which sensitive environmental area receptors and water supplies fall within the ¼ mile layer. Given Methanol's toxicity, more planning and preparation should be undertaken to mitigate a spill of this product before it reaches ground water. **In 2015, over 4.1 million pounds of Methanol were reported to be transported on New Hampshire roadways.**

# NITRIC ACID	
CAS Number 7697-37-2	**UN/NA Number 2031**

General Description

A pale yellow to reddish brown liquid with reddish brown vapors and a suffocating odor. Very toxic by inhalation. Corrosive to metals or tissue. Accelerates the burning of combustible material and may cause ignition of combustible materials upon contact. Prolonged exposure to low concentrations or short term exposure to high concentrations may result in adverse health effects.

Air & Water Reactions

Fumes in air. Fully soluble in water with the release of heat. Reacts violently with water with the production of heat, fumes, and spattering.

Fire Hazard

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. At high concentrations may act as oxidizers. Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Substance may react with water (some violently), releasing corrosive and/or toxic gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. (ERG, 2016)

Health Hazard

TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death. Reaction with water or moist air may 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. (ERG, 2016)

Reactivity Profile

Nitric Acid is a product that will react with a wide range of other products. Most concerning is any contaminants that may be present in a solution of nitric acid. There have been well documented accidents within the State of NH which occurred with acids, including an accident which created a detonation of a flammable vapor due to nitric acid being introduced into a contaminated vessel. The resulting explosion produced severe damage to the large metal and concrete structure and injured 15 people in Southwestern NH in 2014.

Transportation Profile:

Given the manufacturing and technology centers within the State of New Hampshire, Nitric Acid is prevalent in vast quantities in all different concentrations. It is a widely used acid that is vital to the sustainability of many of the States businesses. There were 21 fixed facilities reporting the storage and use of Nitric Acid within the study area in 2015. **The gross amounts of Nitric acid being transported within the study area was over 9.6 million pounds.**

Isolation and Evacuation

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.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown below.
Nitric Acid other than red fuming, would fall within the ¼ mile spill and isolation layer depending on the event.

SULFURIC ACID

CAS Number	**UN/NA Number**	**DOT Hazard Label**
7664-93-9	1830	Corrosive

General Description

Sulfuric acid is a colorless oily liquid. It is soluble in water with release of heat. It is corrosive to metals and tissue. It will char wood and most other organic matter on contact, but is unlikely to cause a fire. Density 15 lb / gal. Long term exposure to low concentrations or short term exposure to high concentrations can result in adverse health effects from inhalation. It is used to make fertilizers and other chemicals, in petroleum refining, in iron and steel production, and for many other uses.

Fire Hazard

It is highly reactive and capable of igniting finely-divided combustible materials on contact. When heated, it emits highly toxic fumes. Avoid heat; water and organic materials. Sulfuric acid is explosive or incompatible with an enormous array of substances. Can undergo violent chemical change at elevated temperatures and pressure. May react violently with water. When heated, it emits highly toxic fumes. Hazardous polymerization may not occur. (EPA, 1998)

Health Hazard

Corrosive to all body tissues. Inhalation of vapor may cause serious lung damage. Contact with eyes may result in total loss of vision. Skin contact may produce severe necrosis. Fatal amount for adult: between 1 teaspoonful and one-half ounce of the concentrated chemical. Even a few drops may be fatal if the acid gains access to the trachea. Chronic exposure may cause tracheobronchitis, stomatitis, conjunctivitis, and gastritis. Gastric perforation and peritonitis may occur and may be followed by circulatory collapse. Circulatory shock is often the immediate cause of death. Those with chronic respiratory, gastrointestinal, or nervous diseases and any eye and skin diseases are at greater risk. (EPA, 1998)

Isolation and Evacuation

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.
SPILL: Increase, in the downwind direction, as necessary, the isolation distance shown above.
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. (ERG, 2016)

Transportation Profile

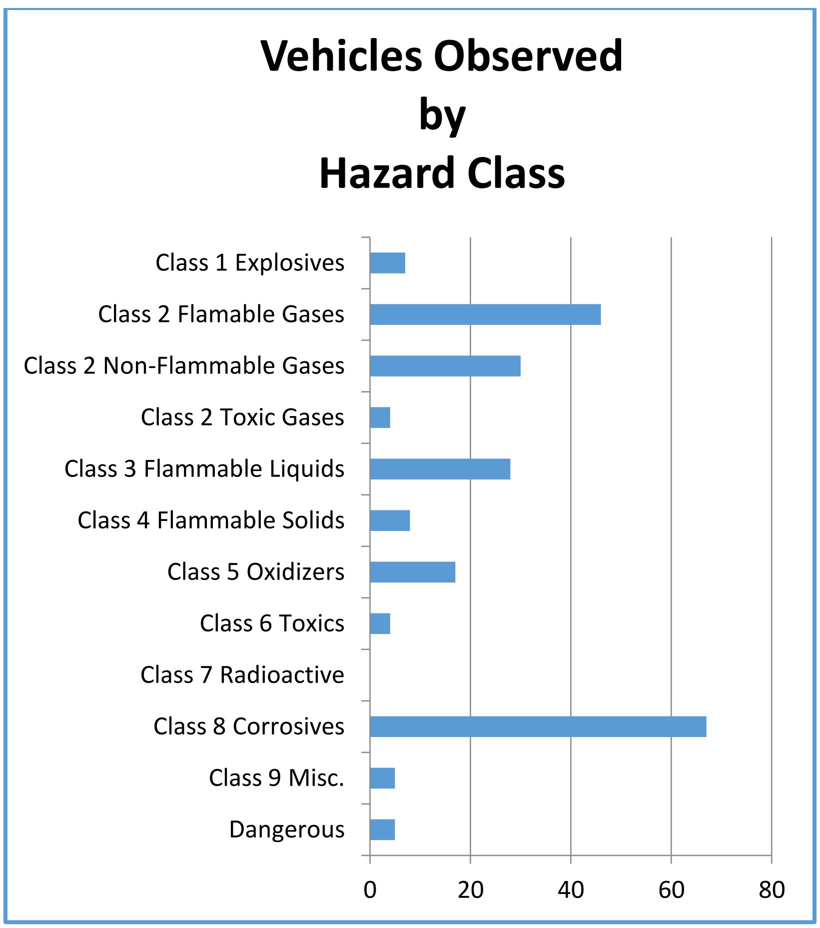
Sulfuric Acid is the most abundant Extremely Hazardous Substance in the State of NH. It is found in many batteries and processes in the industries in New Hampshire. Due to Sulfuric Acid’s extreme corrosiveness, reactivity and toxicity it is regulated as an Extremely Hazardous Substance. Sulfuric Acid is found on every roadway in the State of NH. Several fixed facilities in the study area report large quantities of Sulfuric Acid on site, in the thousands of pounds. The quantity of Sulfuric Acid reported as being transported to facilities on New Hampshire’s roadways was reported to be in excess of 17.3 million pounds in 2015. This amount does not include the product reported from batteries in facilities. The ¼ mile spill layer is used to identify sensitive environmental water areas for planners to identify potential problem areas.

Visual Surveys

The final area where data was collected was to capture hazardous materials commodities traveling through the state. No database within the State of NH will contain sufficient information, requiring actual monitoring of key routes to track placarded vehicles driving over our roadways.

These truck counts were conducted in a number of ways. The first and most prevalent way was by regular monitoring of roadways by data collection personnel. As for the regular monitoring truck counts, surveys were conducted on 50 different days between March and October of 2015. These surveys were conducted along the major traffic routes within the State by the participating survey partners. It should be noted that it is likely that vehicles were traveling through during these surveys which did not contain the required quantity for a placard, or may have been incorrectly placarded due to operator error.

The analysis of the visual survey data confirmed the movement of the large amounts of corrosives that were identified in the Tier II reports. Many of these corrosives were in placarded tractor trailer box trucks which would indicate drums and totes of corrosives were prevalent in the transportation system in NH.



Transportation Road Segments

This study focuses on multiple interstate highway segments within the State of New Hampshire. The selection of these transportation road segments was made due to the known hazardous materials being transported upon them. Inclusive of the vehicular visual surveys and Tier 2 reports from facilities indicating which road segments the products are in transit provided direction to the participants to focus on specific road segments.

9 separate transportation road segments were identified and upon each road segment 5 isolation or planning buffers were created for specific hazards related to identifying hazardous materials being transported upon those segments. The purpose of the isolation planning buffer is to identify a level of potential risk to the surrounding area. Existing within and along these transportation road segments are specific susceptible populations and or sensitive environmental receptors.

The following road segments were selected to be the focus of this study:

I-95 Mass state line to Maine state line

NH Rte. 101 Hampton to Manchester

I 93 Mass state line to Manchester

I-93/293 Manchester to Concord

I-93 Concord to Plymouth

I-93 Plymouth to VT state line

I-89 Concord to New London

I-89 New London to VT state line

Everett Turnpike Mass state line to I-293

Isolation or planning buffers

¼ Mile Spill (Environmental Sensitive Areas)

¼ Mile Airborne Chemical Release

½ Mile Airborne Chemical Release

1 Mile Airborne Chemical Release

5 Mile Chlorine Chemical Release

The rationale for the Isolation and planning buffers is due to the chemical and physical hazard properties that the individual chemicals possess. Airborne toxicity is the key concern with many of the chemicals being transported within the State of New

Hampshire. Utilizing planning guides within both the 2016 Emergency Response Guidebook and CAMEO Chemicals, the isolation buffers represent well documented and supported guidelines to protect downwind at risk populations in the event of a release of product.

Chemical specific product sheets have been produced to identify which buffer zone the individual products are related to. For example, Chlorine would fall within the 1 mile and 5 mile Airborne Chemical Release buffer zones due to the different size containers that have been identified as being shipped. Many products will fall within a small and large spill buffer zone.

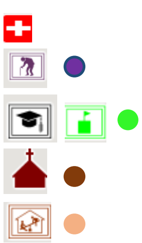
There are several products being transported within the State of New Hampshire that do not have an airborne hazard. The concern with these products is if there is a spill, and the products are allowed to reach a sensitive environmental area, this may cause significant impact to a local community. These products are noted as falling within the ¼ mile spill buffer zone.

Identification of Hazard Receptors

Hazard Receptors are special populations comprised of anyone who requires special consideration to be appropriately protected. For example, congregate care facilities, such as hospitals, nursing homes, day care facilities, and schools may require special arrangements to overcome populations with physical handicaps or may have reduced capacity to fully comprehend warnings.

Prisons, juvenile detention centers, and other institutions of confinement may require special security arrangements. Any facility where large numbers of people congregate en mass—stadiums, arenas, fair grounds, convention centers, auditoriums, and churches—may require special arrangements to accommodate the large numbers of potential exposures.

For this study the following hazard receptors were selected:



Hospitals
Nursing Homes
Educational Facilities
Places of Worship
Daycares

Risk Calculation

Relative risk can be calculated by the severity of the product, significant population exposure and the probability of a release impacting the particular downwind population. Prioritizing these risks enables the planning efforts to further address high-risk facilities and road segments and prioritize mitigation and preparedness resources accordingly.

Considerations for Identifying At-Risk Populations

The residential population in the potential hazard zone is of critical importance, especially during certain times (e.g., evenings, late nights, and weekends). Retail and commercial areas are of particular interest during peak use periods (e.g., shopping malls during the holiday season, office buildings during typical work hours).

Special populations require special attention, especially those located in (or near) the potential hazard zone. Planners may wish to focus on special-population facilities that reside in a confluence of potential hazard zones associated with various routes or route segments.

Congregations of people for special gatherings (e.g., large sporting or entertainment events, fairs, religious or political events) also may require focused attention. Event planners may wish to consider relocating some events to venues outside the potential hazard zones.

Populations within the State of New Hampshire vary widely with geographic location and demographics. The Study areas include the most densely populated counties in the State. Hillsborough and Rockingham counties reflect the most populated counties in the Study. Identification of populations and housing units within transport road segment buffer areas are of primary concern. This data was acquired by using US Census data embedded within the MARPLOT program. Identifying the areas of concern for planners is the primary goal of the buffer layers. Having this information will provide guidance to local and regional emergency response planning efforts to protect the States' citizens and visitors.

Sensitive Environmental Receptors

Sensitive environmental receptors were another important focus area of this study. New Hampshire relies heavily on clean ground water for drinking water for the residents of the State. Many public and private wells can be found within ¼ mile of the transportation road segments on this study. By utilizing New Hampshire Department of Environmental Services One Stop GIS data sets, the study is able to identify sensitive environmental receptors such as well heads, wells, water intakes, drainage areas and streams among others within the transportation route buffer.

Information can be found on those receptors in each transportation route segment. By identifying these areas, local agencies will be able to perform a more thorough response capability assessment for spill product in a transportation accident. Local response plans will be able to provide the identification of storm drain, run off and other access points to assist emergency responders in quickly containing a spilled product before it reaches priority drain areas. For this study the following sensitive environmental receptors were selected:

Map Key and Icons for Environmental Receptors:

Streams and Runoff
Water Bodies
Public Water Supply Wells
Wellhead Protection Areas
Water Supply Intake Protection

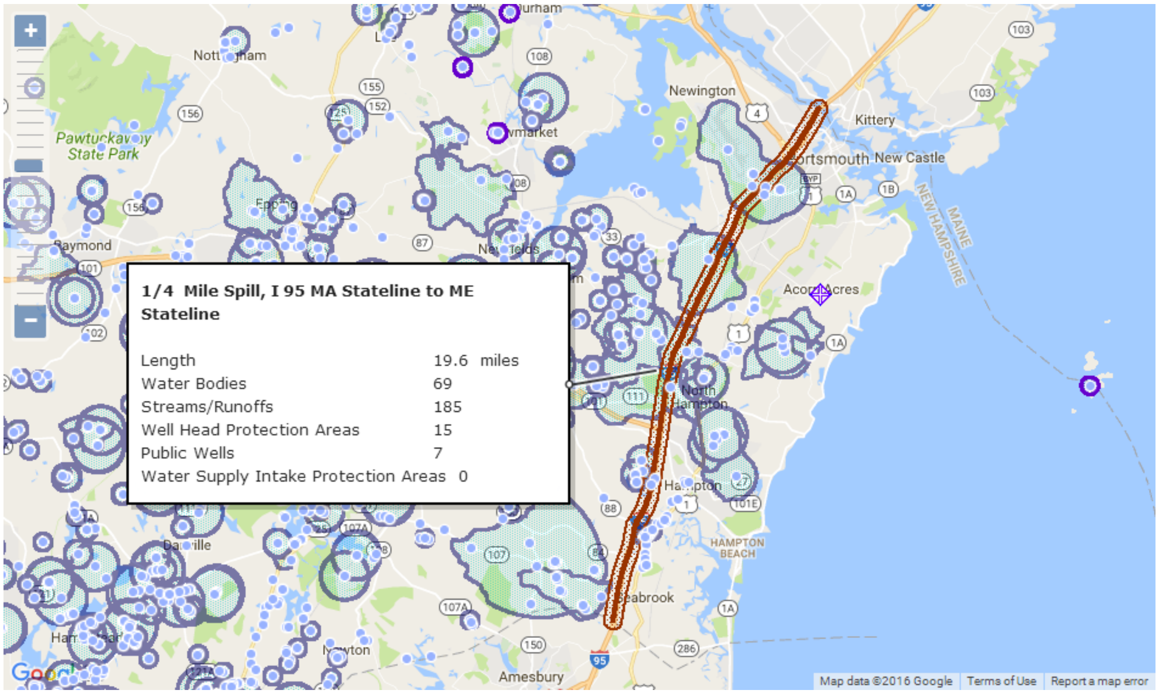
Data Sources

The following is an overview of the available data sources used for this study:

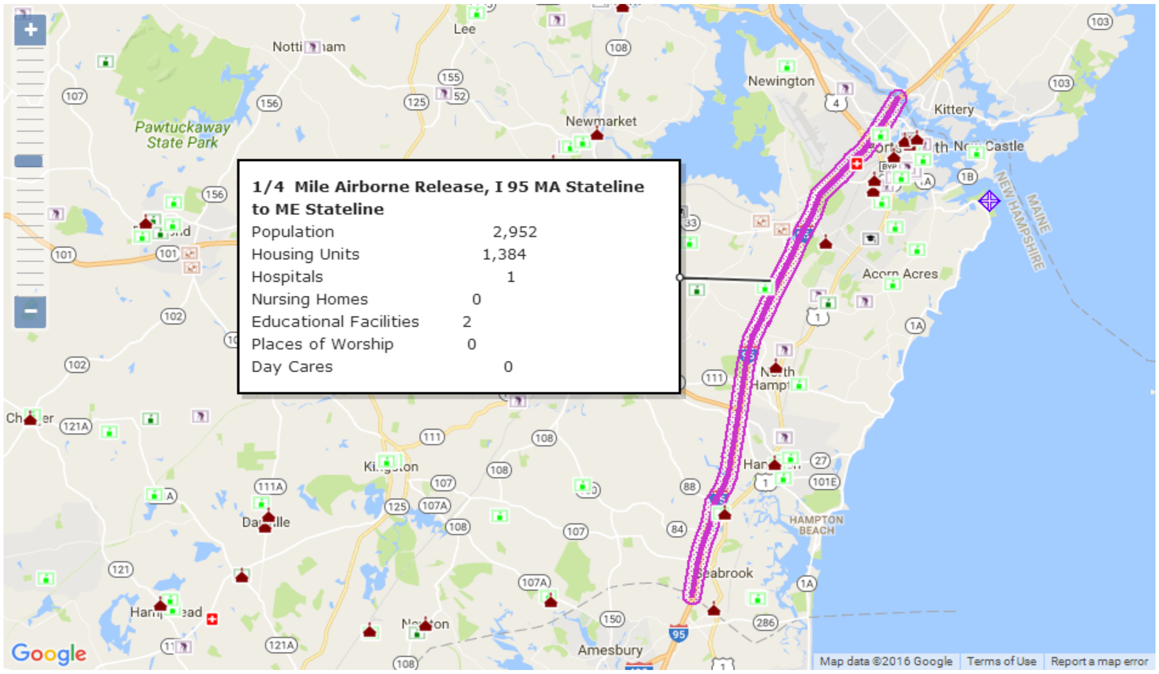
Base Layers	**Source**
Base Maps	Marplot 2016 Google Streets
Local Boundaries	NH Granite
Roads	Marplot 2016 Google Streets
Water Features	NH Department of Environmental Services
Railroads	NH Granite
Chemical Facilities	Source
Tier II Facilities	2015 Tier II Data, provided by NH Homeland Security & Emergency Management
Vulnerable Populations	Source
Population Data	Marplot, 2010 US Census Data
Housing Unit Data	Marplot, 2010 US Census Data
Hospitals	NH Granite
Nursing Homes	NH Granite
Educational Facilities	NH Granite
Places of Worship	NH Granite
Day Care Facilities	NH Granite
Sensitive Environmental Locations	Source
Water Bodies	NH Department of Environmental Services
Public Drinking Water Supply Wells	NH Department of Environmental Services
Public Wellhead Protection Areas	NH Department of Environmental Services
Public Water Supply Protection Areas	NH Department of Environmental Services

ISOLATION AND PLANNING BUFFER MAPS

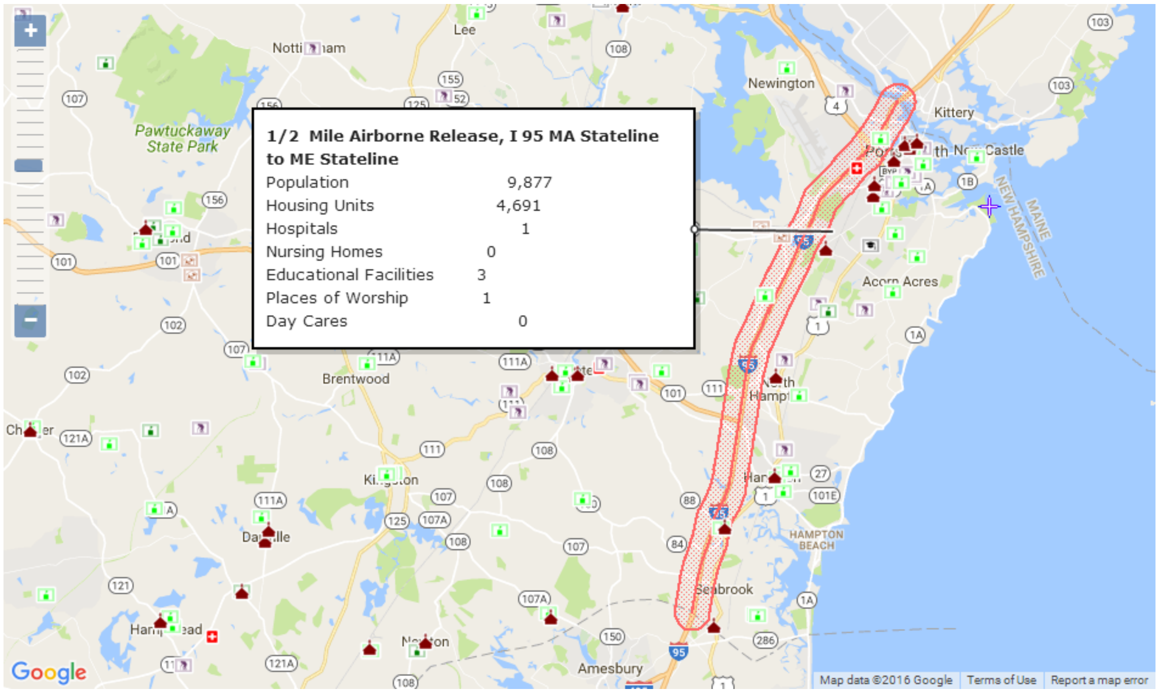
Interstate 95 Massachusetts Stateline to Maine Stateline



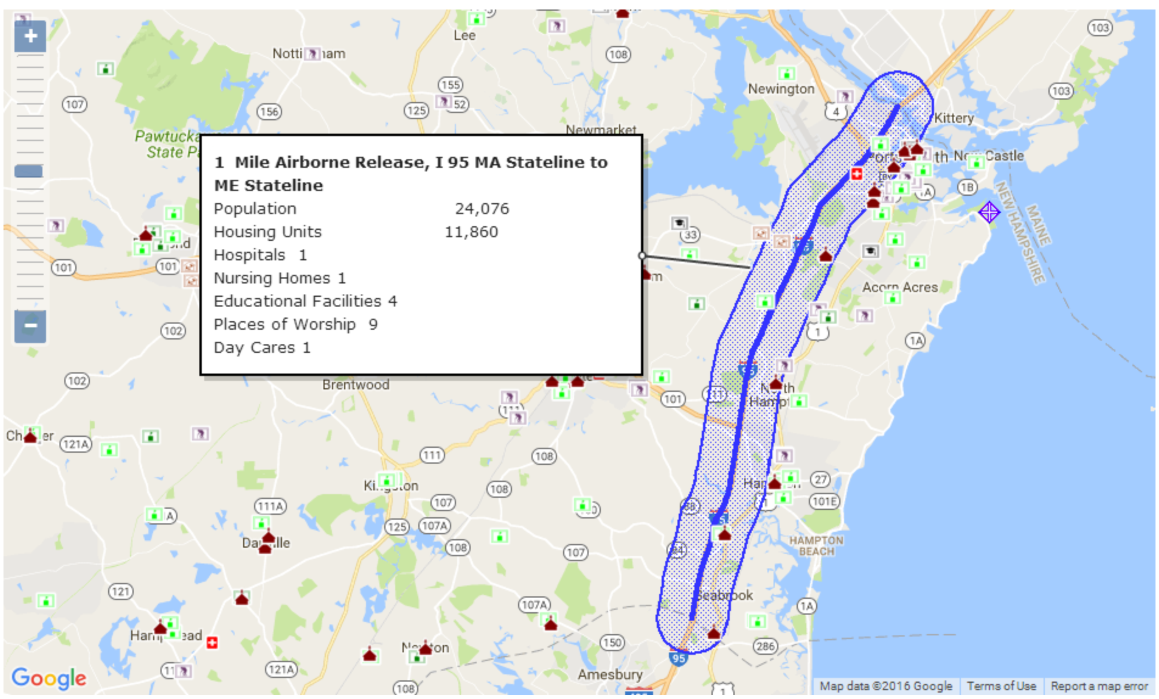
¼ Mile Spill to Identify Sensitive Environmental Receptors



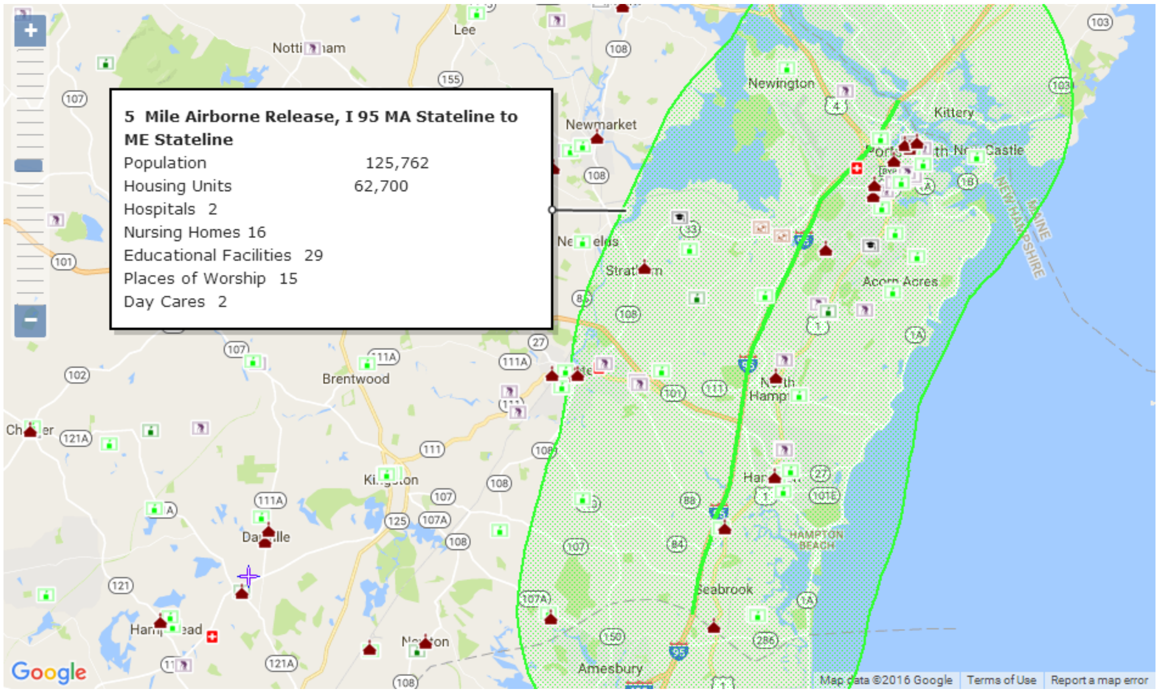
1/4 Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

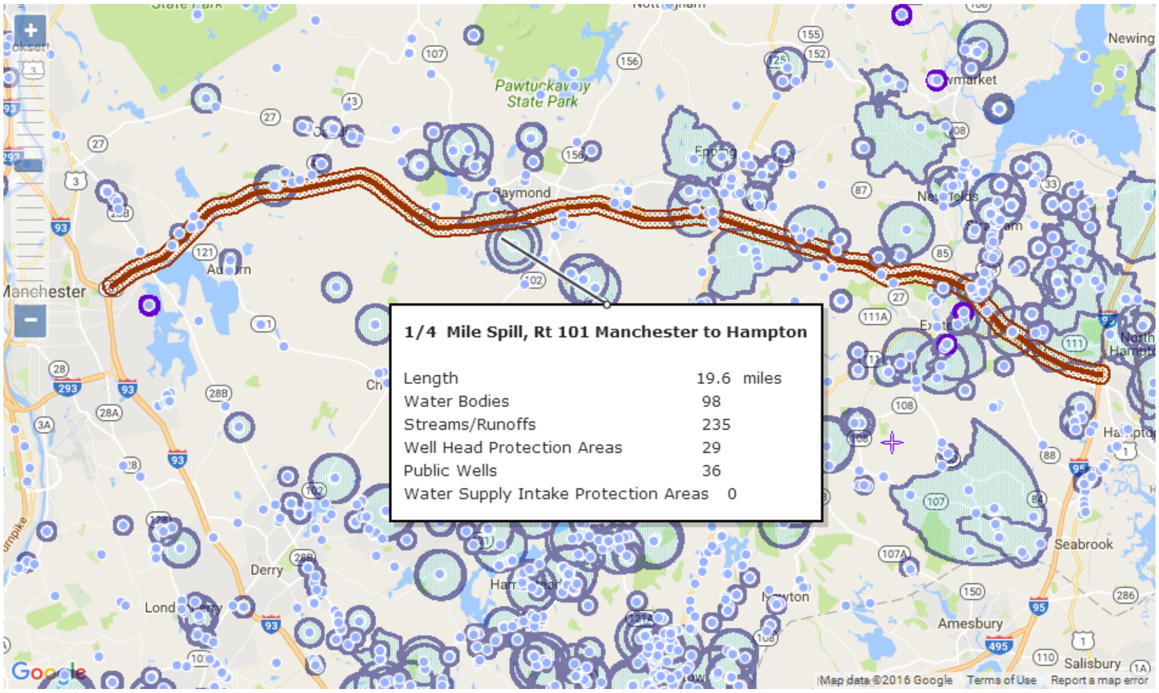


1 Mile Airborne Release with Susceptible Population Receptors

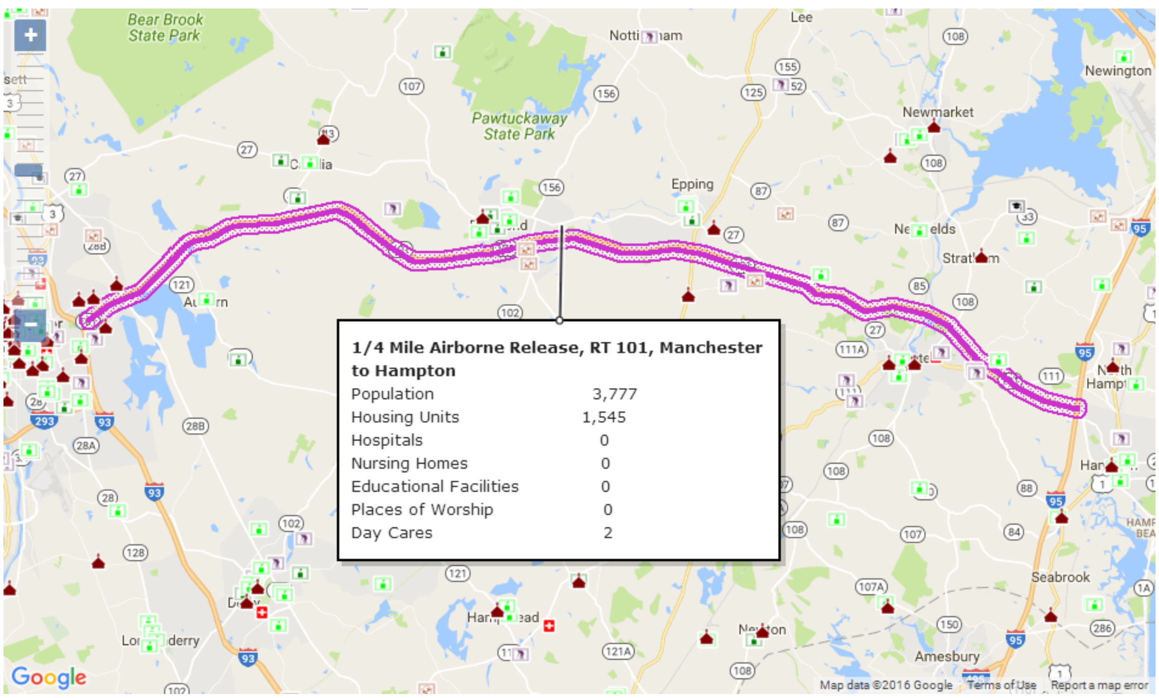


5 Mile Airborne Release for Chlorine with Susceptible Population Receptors

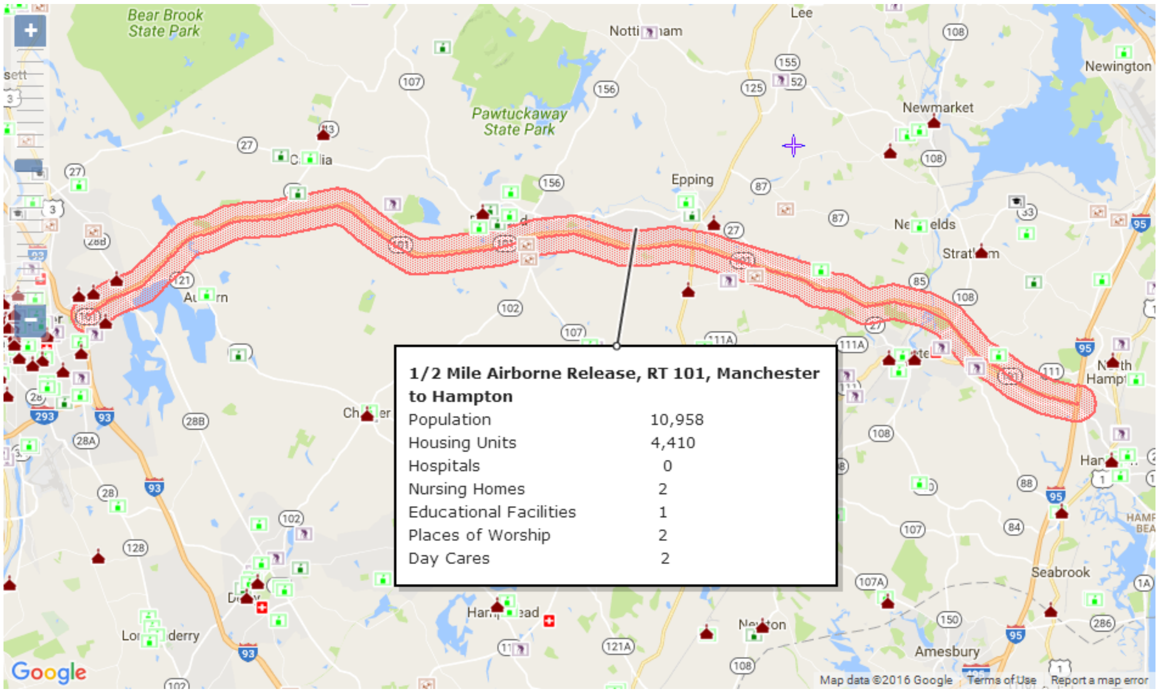
<u>New Hampshire Route 101, Hampton to Manchester</u>



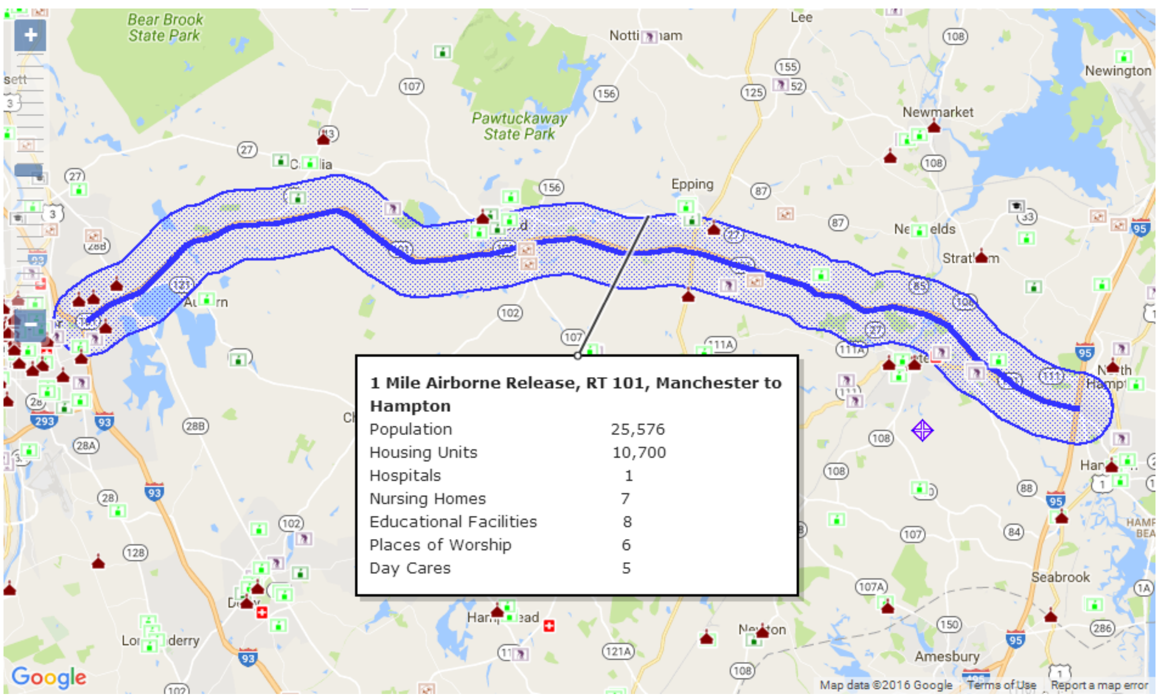
¼ Mile Spill Release to Identify Sensitive Environmental Receptors



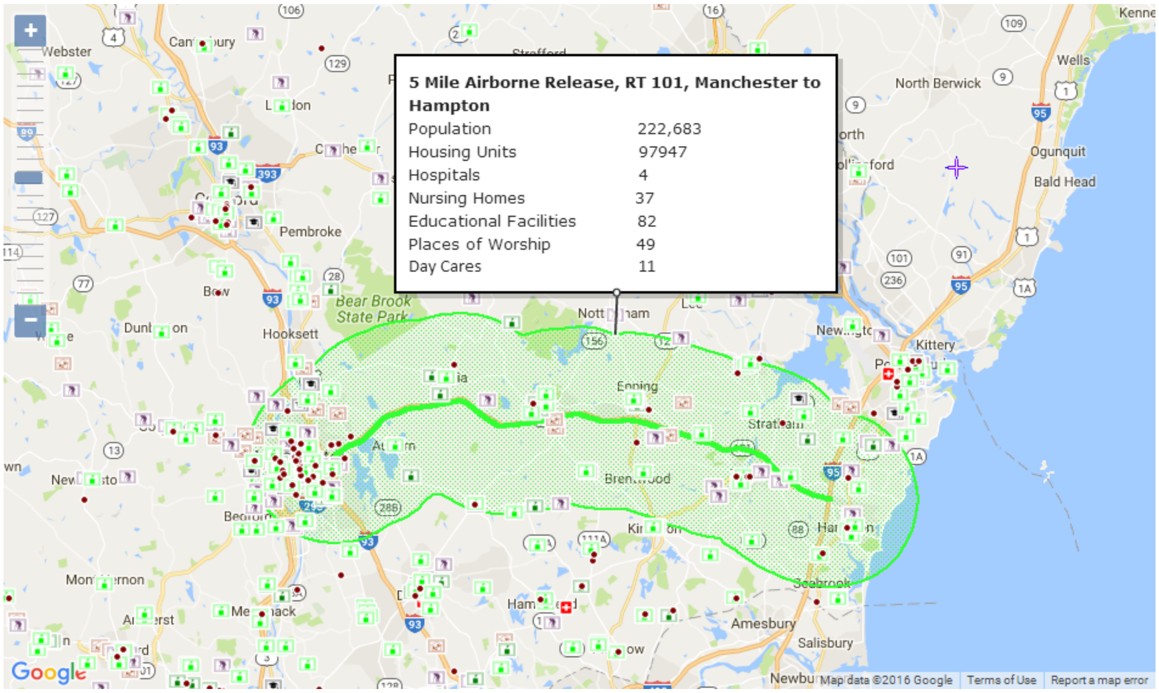
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

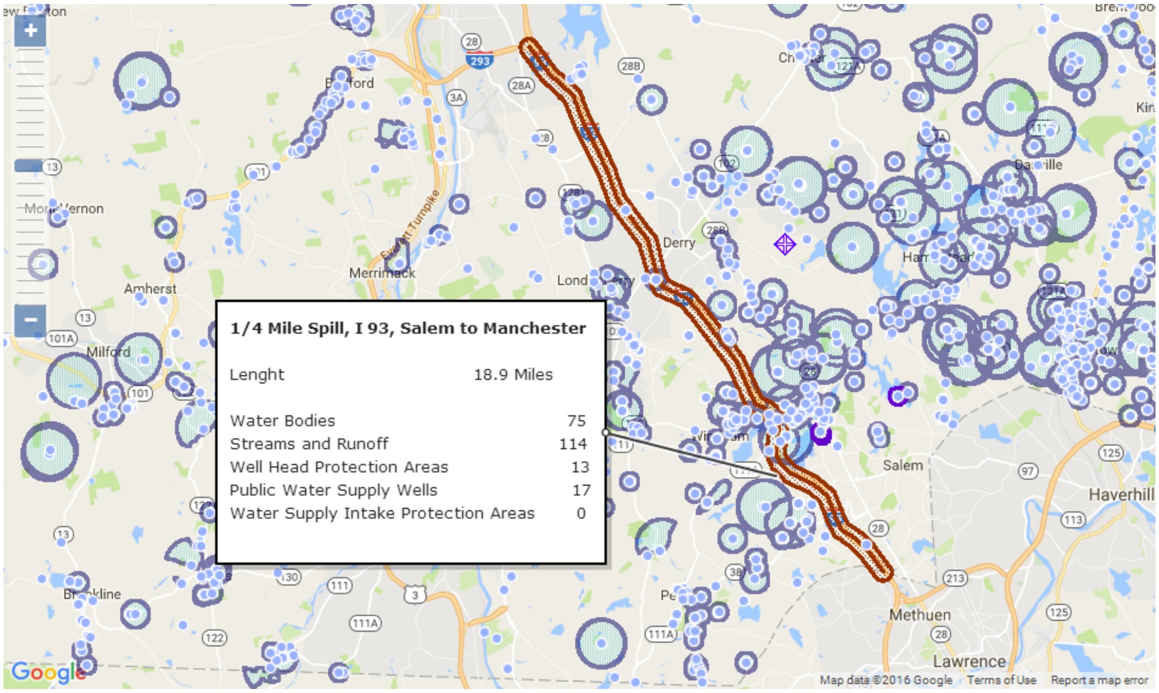


1 Mile Airborne Release with Susceptible Population Receptors

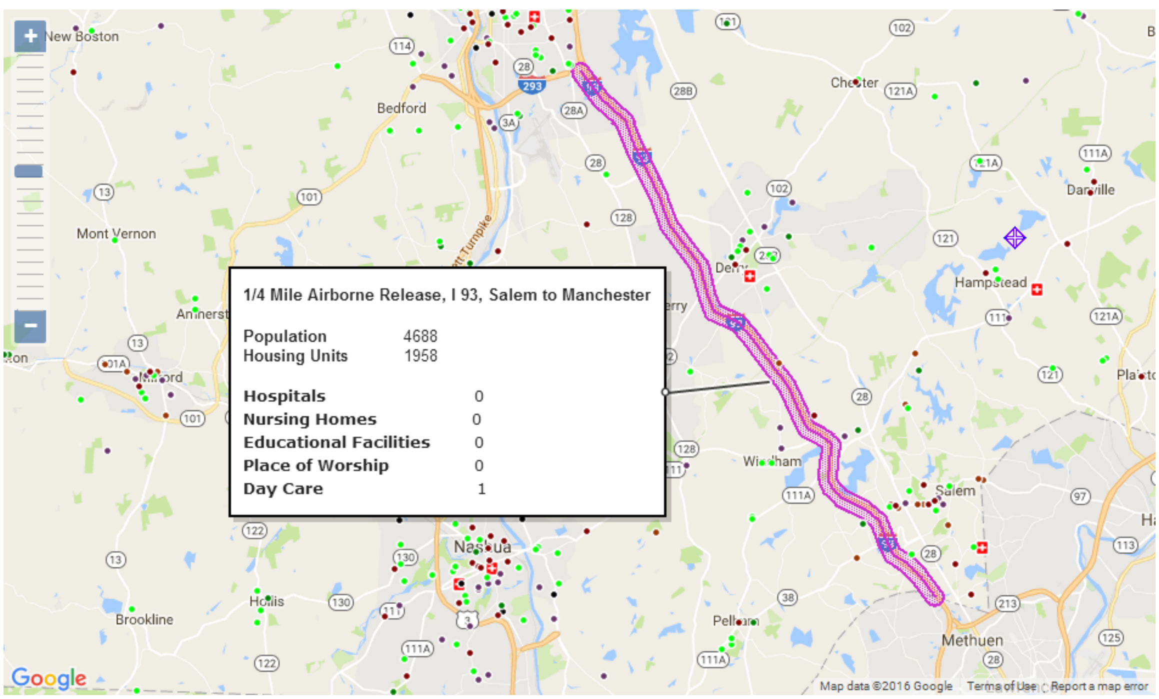


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

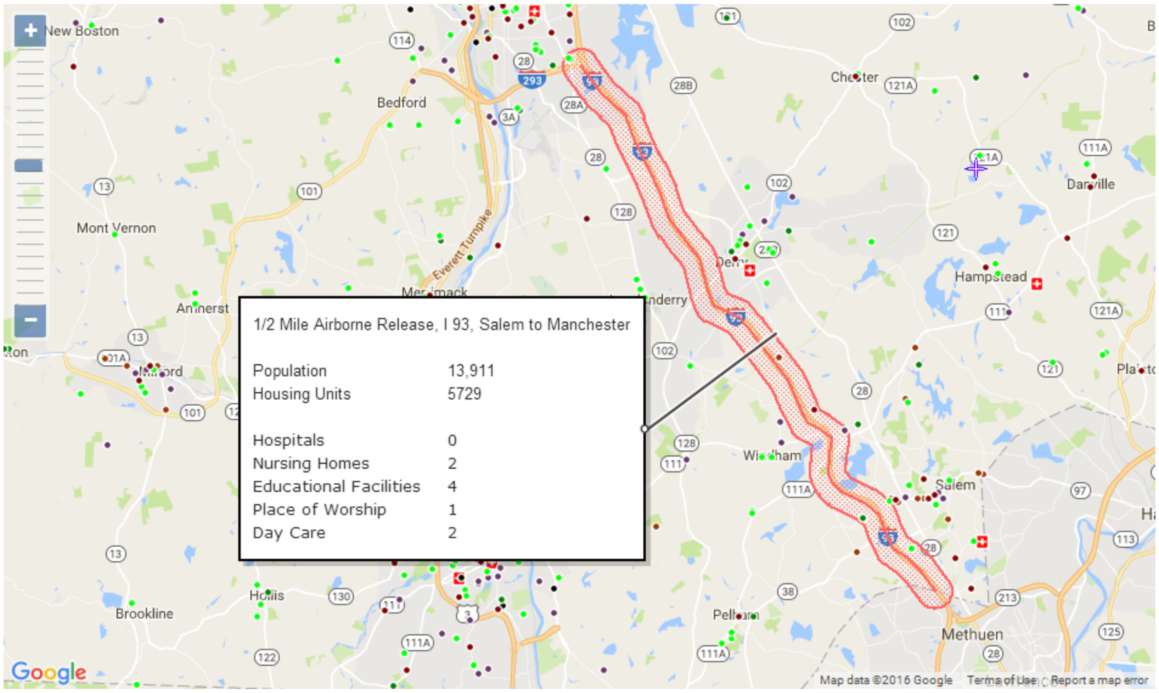
Interstate 93 Massachusetts Stateline to Manchester



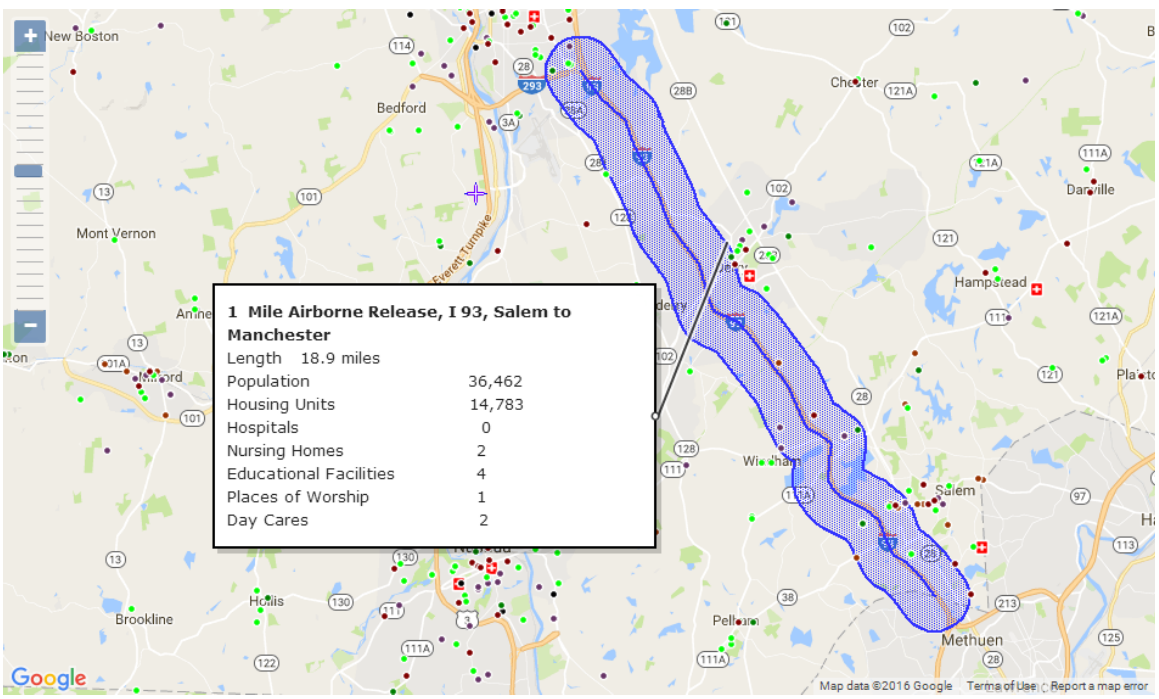
¼ Mile Spill with Sensitive Environmental Receptors Identified



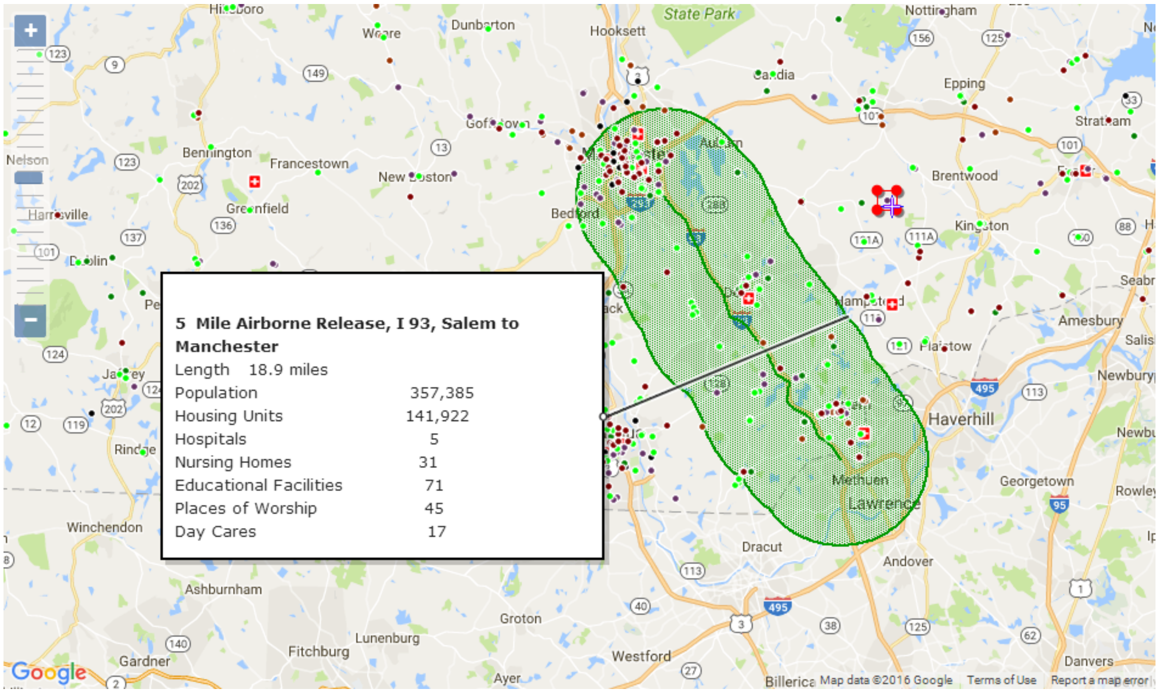
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

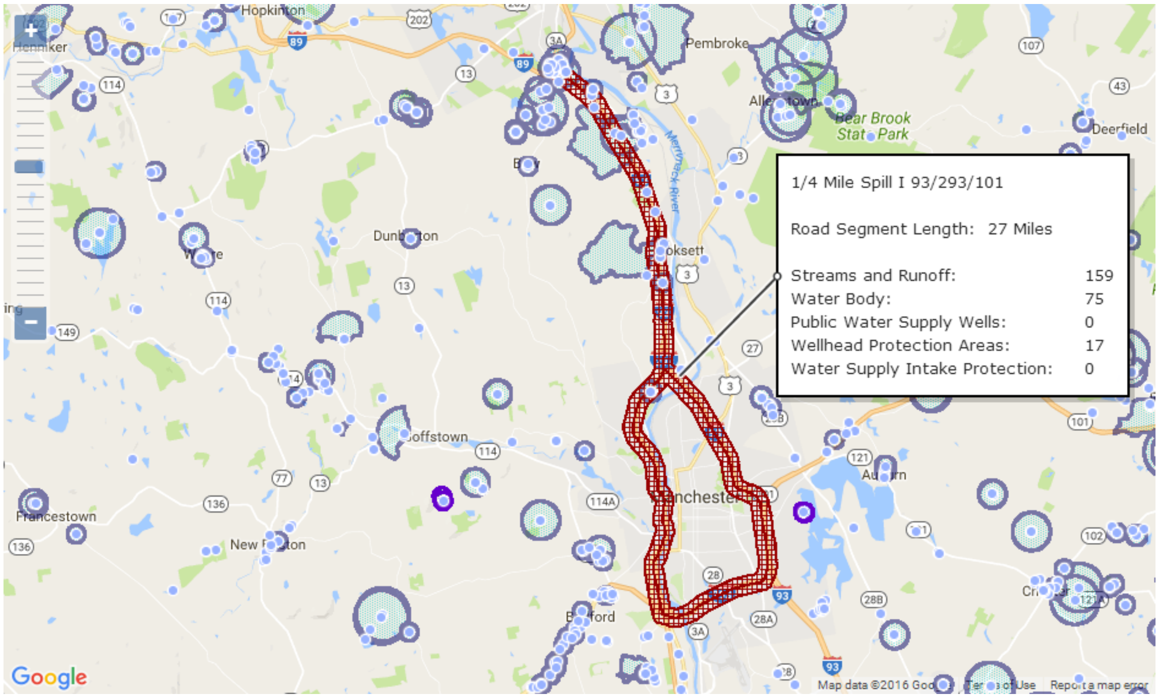


1 Mile Airborne Release with Susceptible Population Receptors

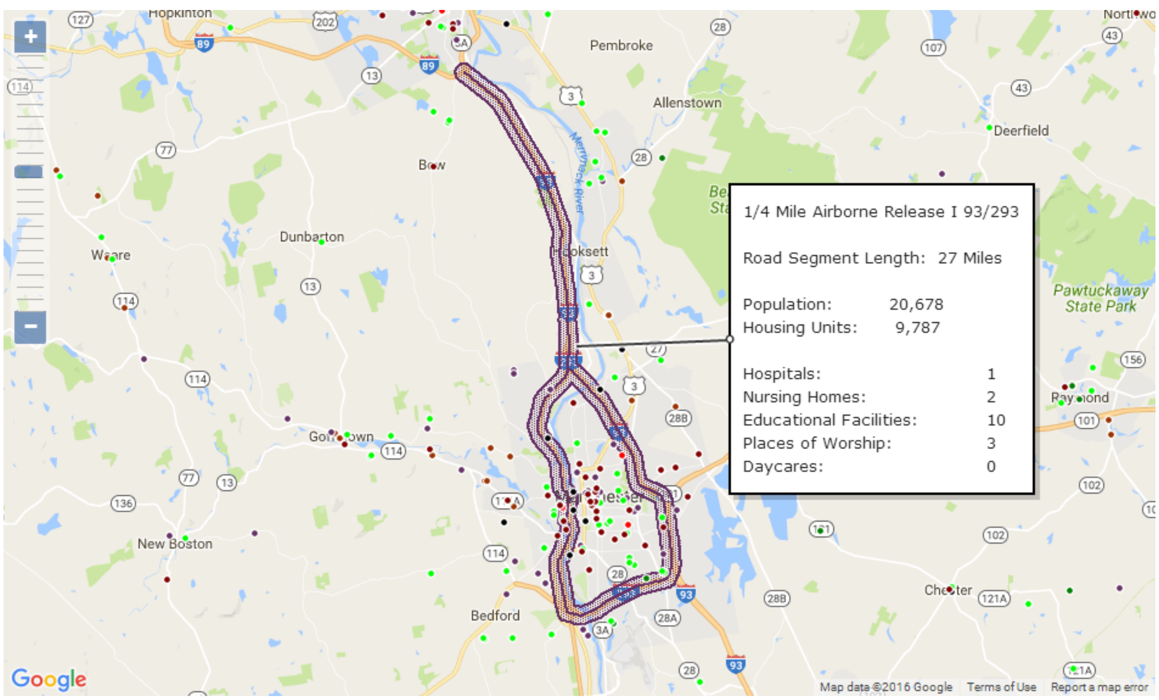


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

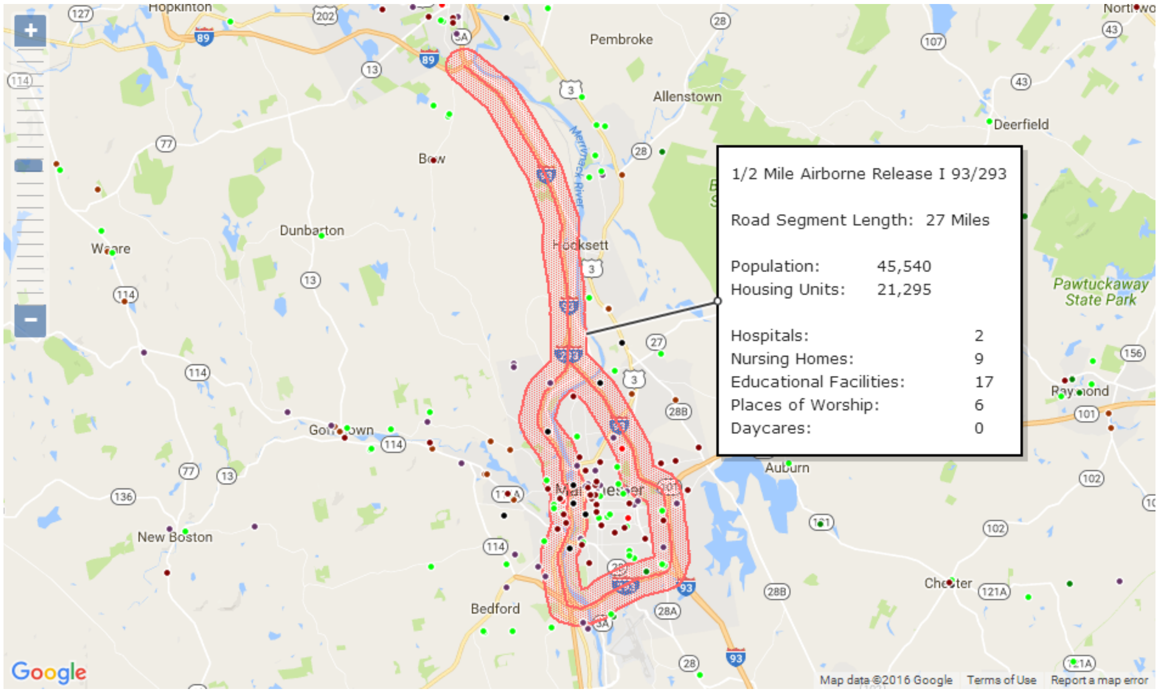
Interstate 93 - 293 Manchester to Concord



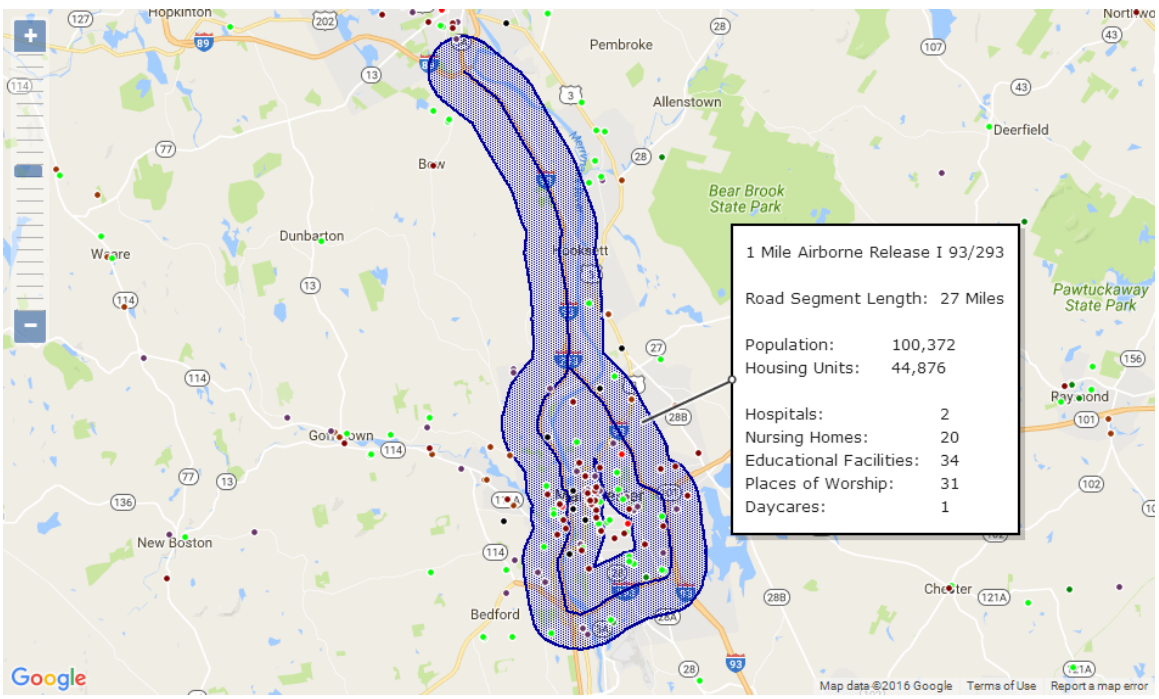
¼ Mile Spill with Sensitive Environmental Receptors Identified



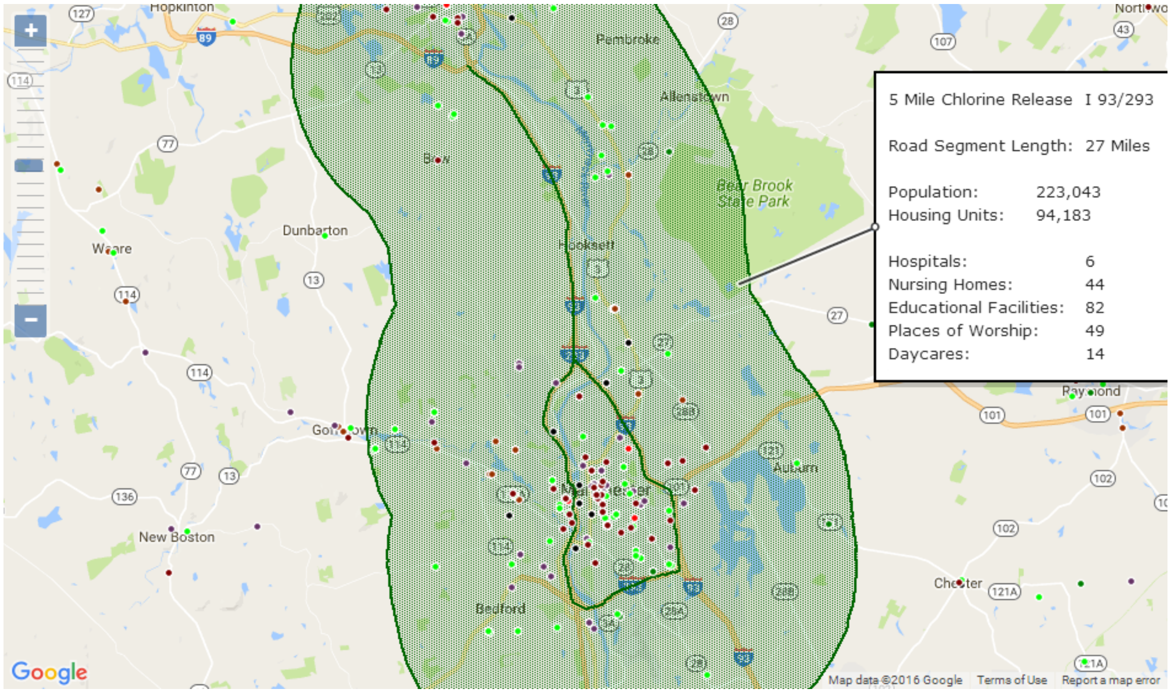
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

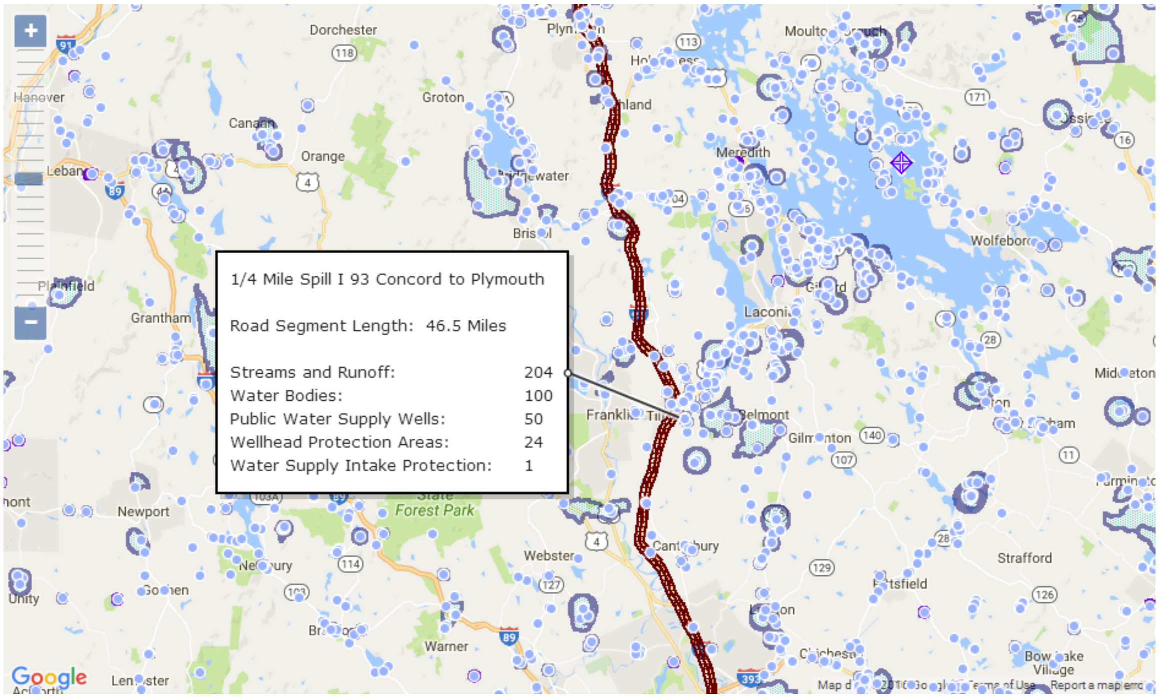


1 Mile Airborne Release with Susceptible Population Receptors

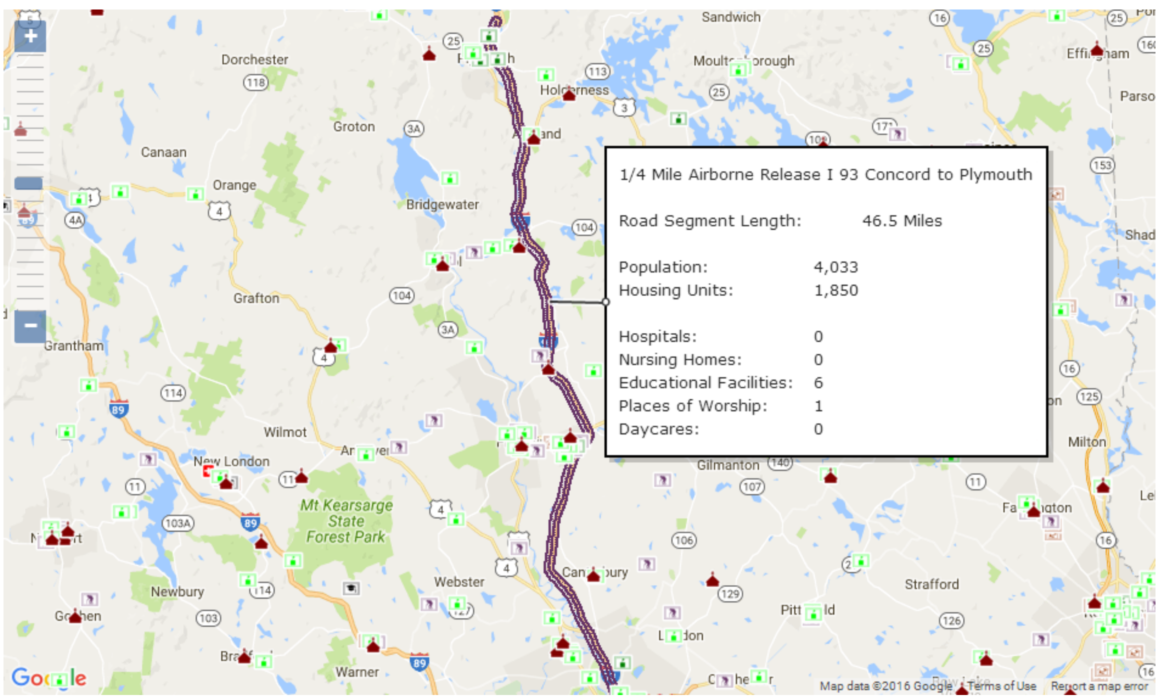


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

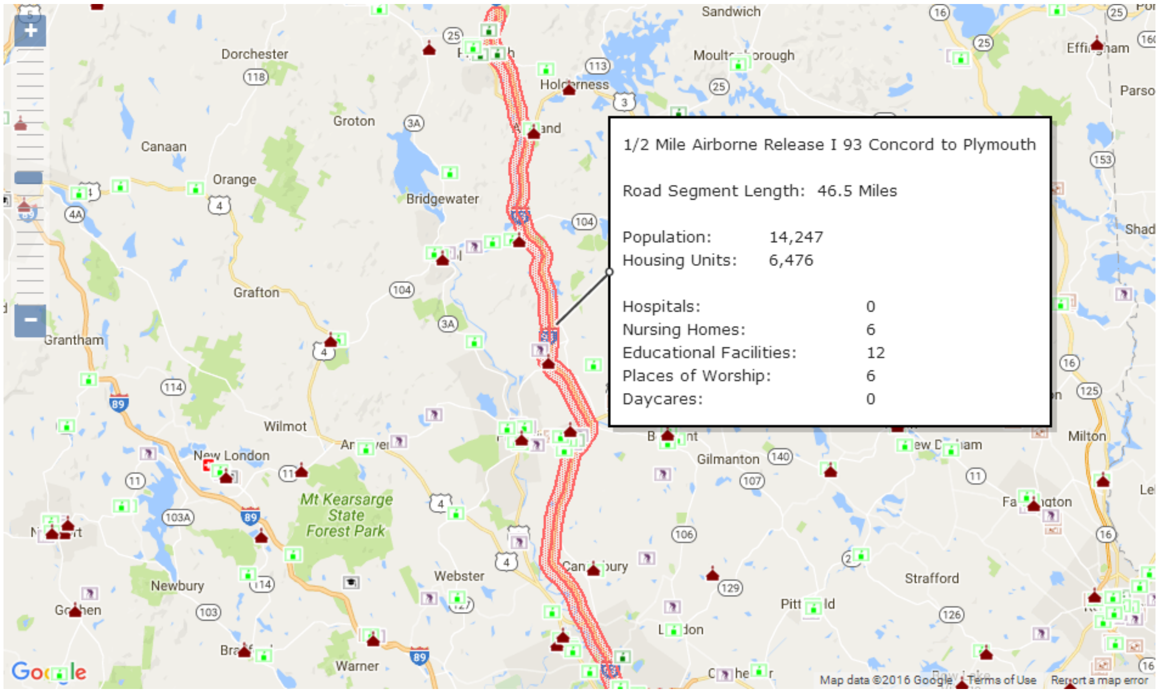
Interstate 93 Concord to Plymouth



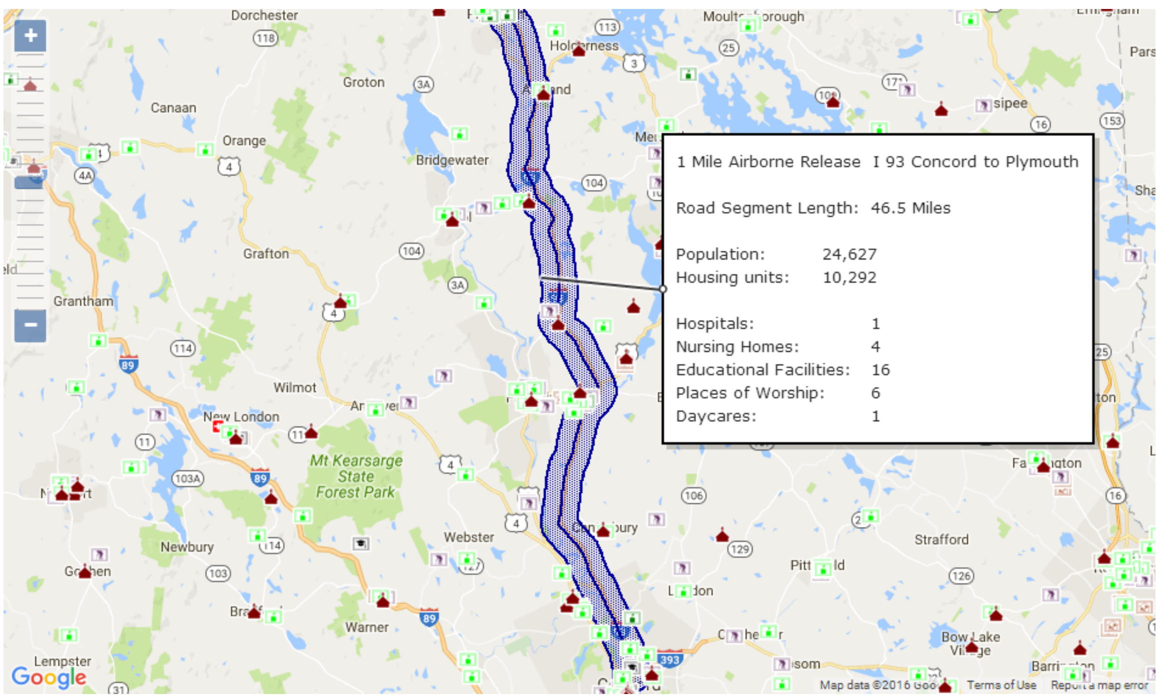
¼ Mile Spill Release with Sensitive Environmental Receptors Identified



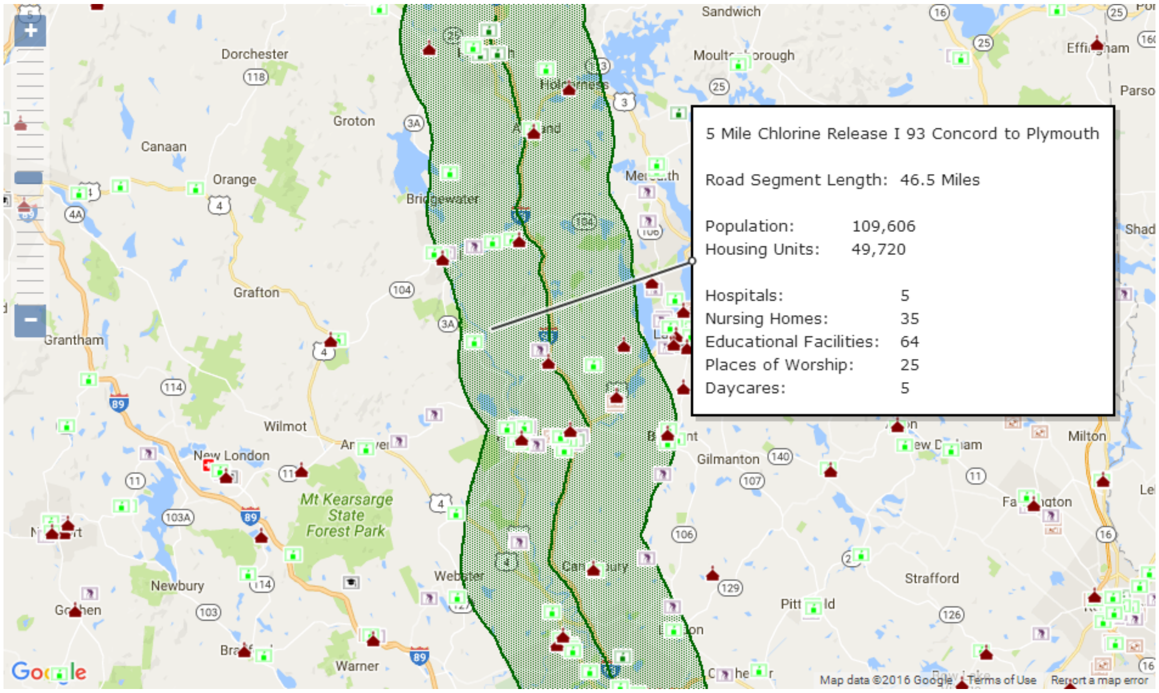
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

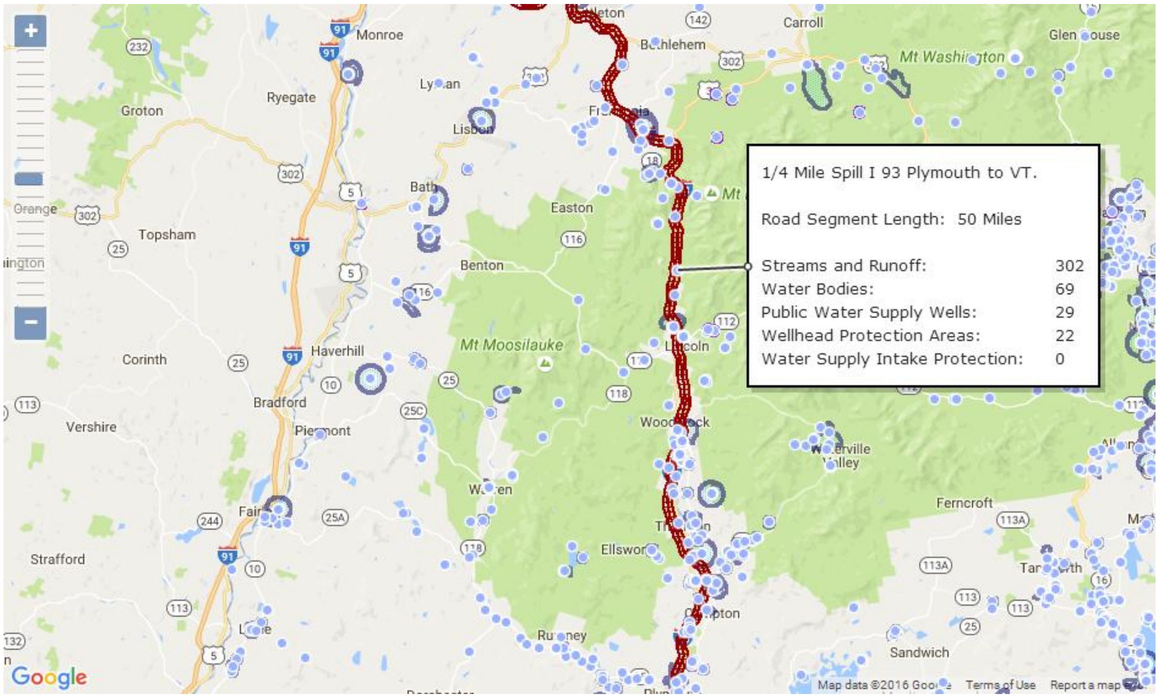


1 Mile Airborne Release with Susceptible Population Receptors

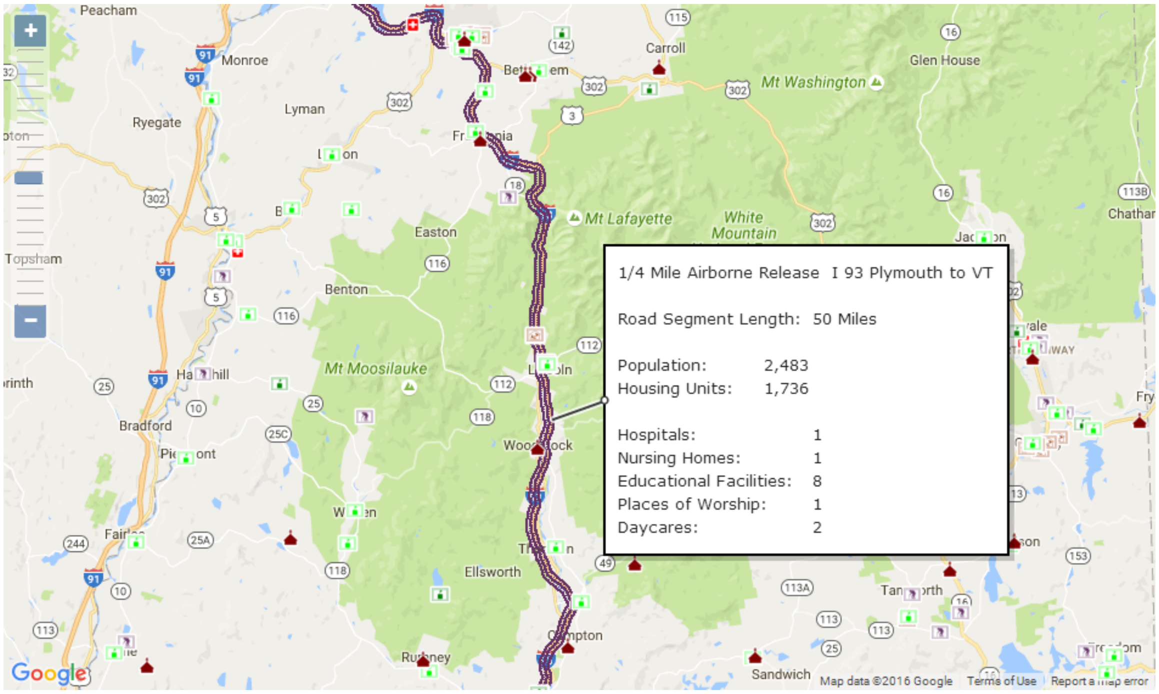


5 Mile Airborne Release with Susceptible Population Receptors

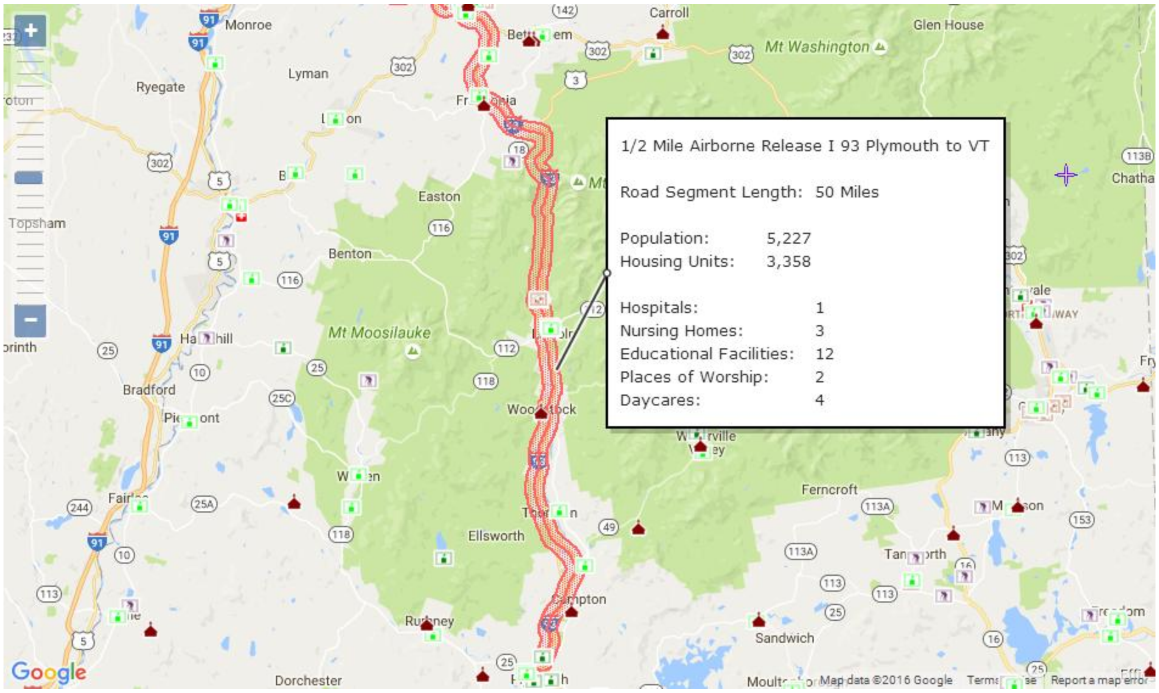
Interstate 93 Plymouth to Vermont Stateline



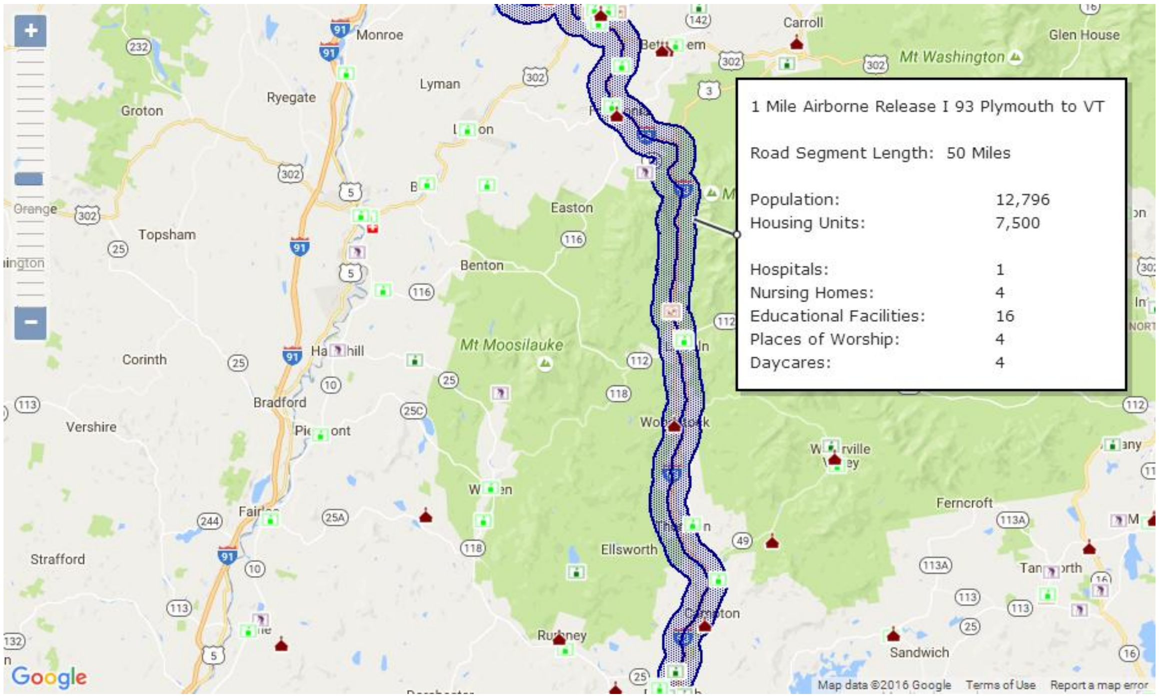
¼ Mile Spill Release with Sensitive Environmental Receptors Identified



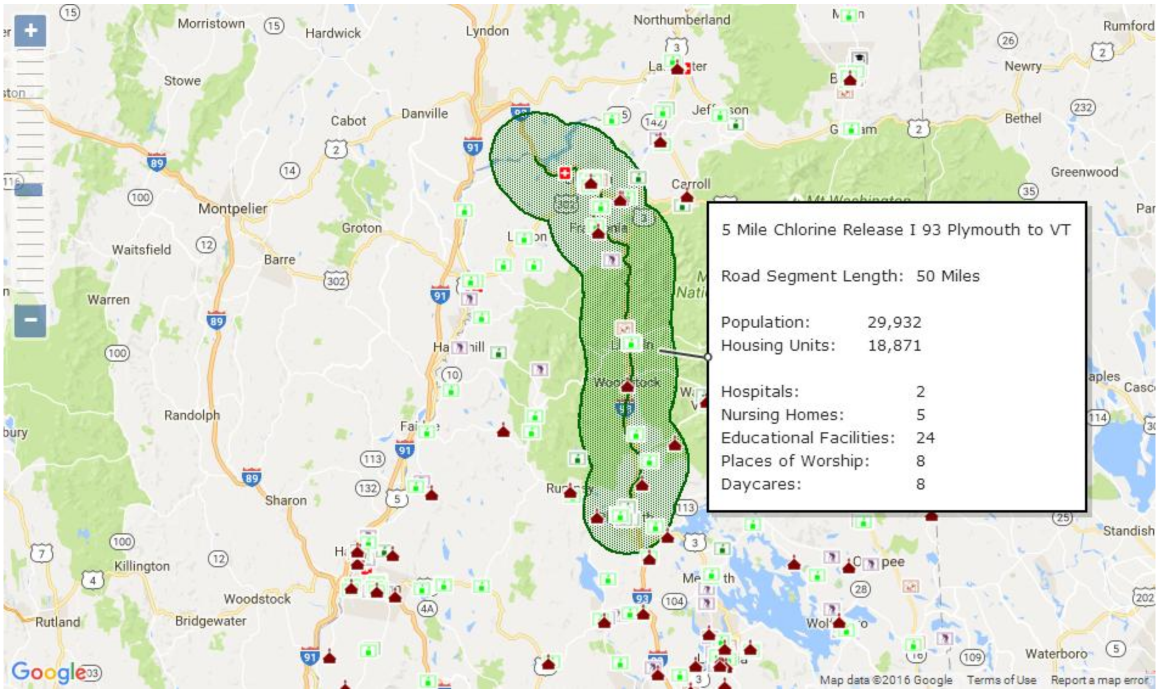
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

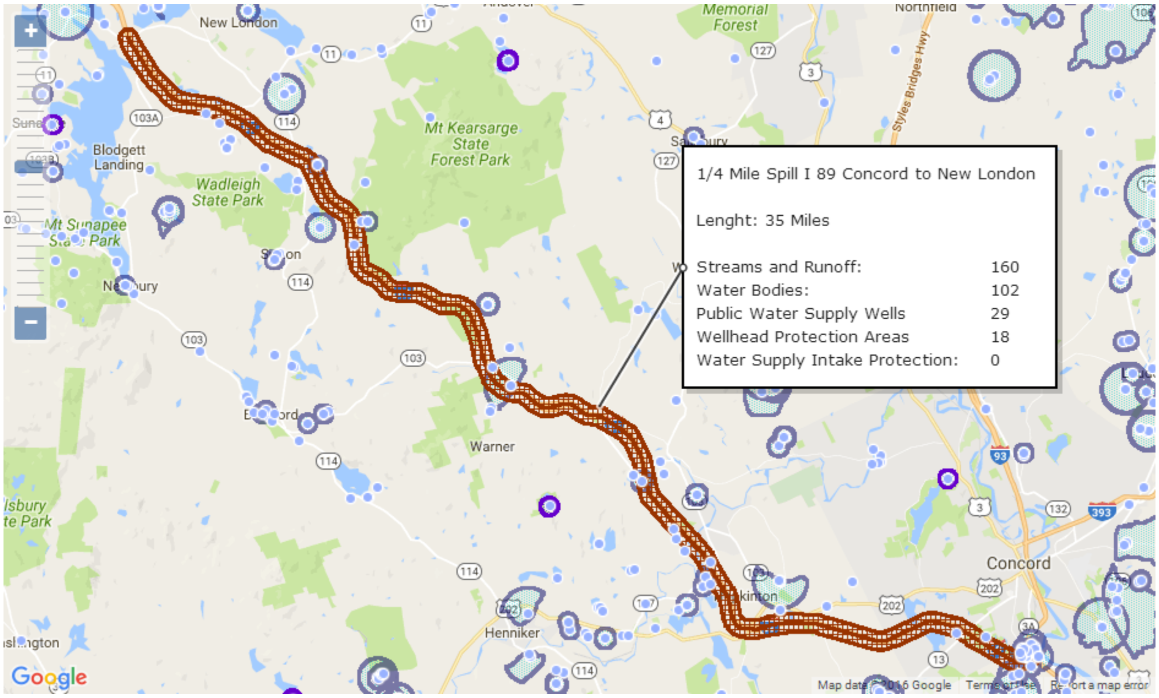


1 Mile Airborne Release with Susceptible Population Receptors

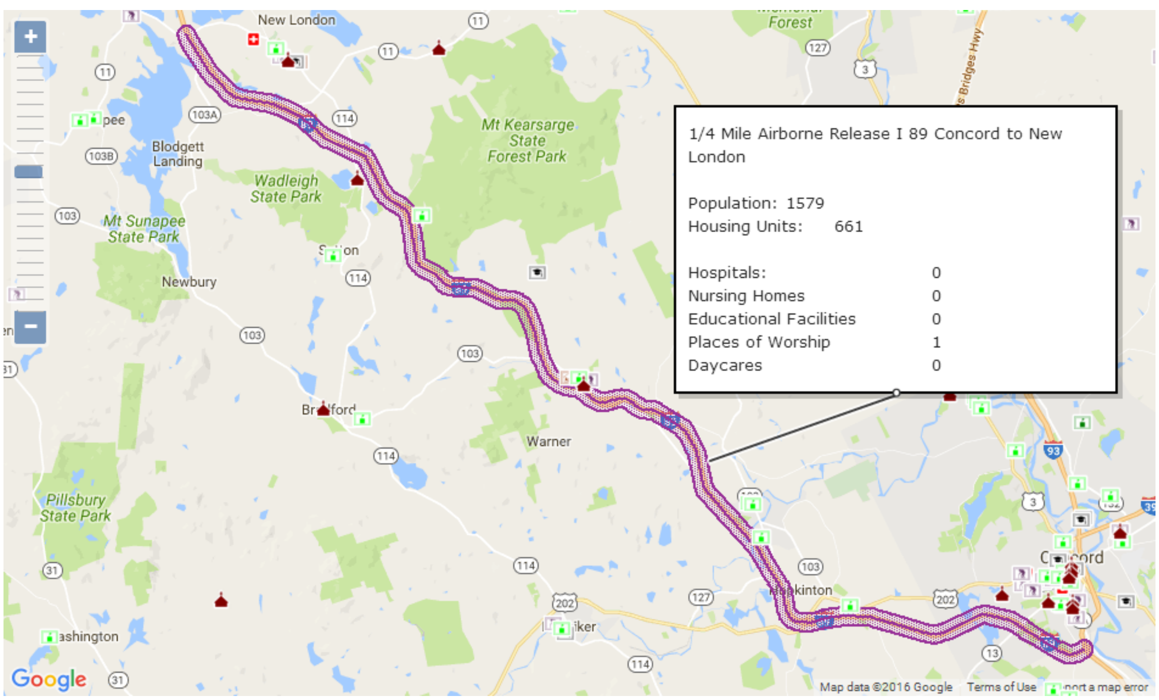


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

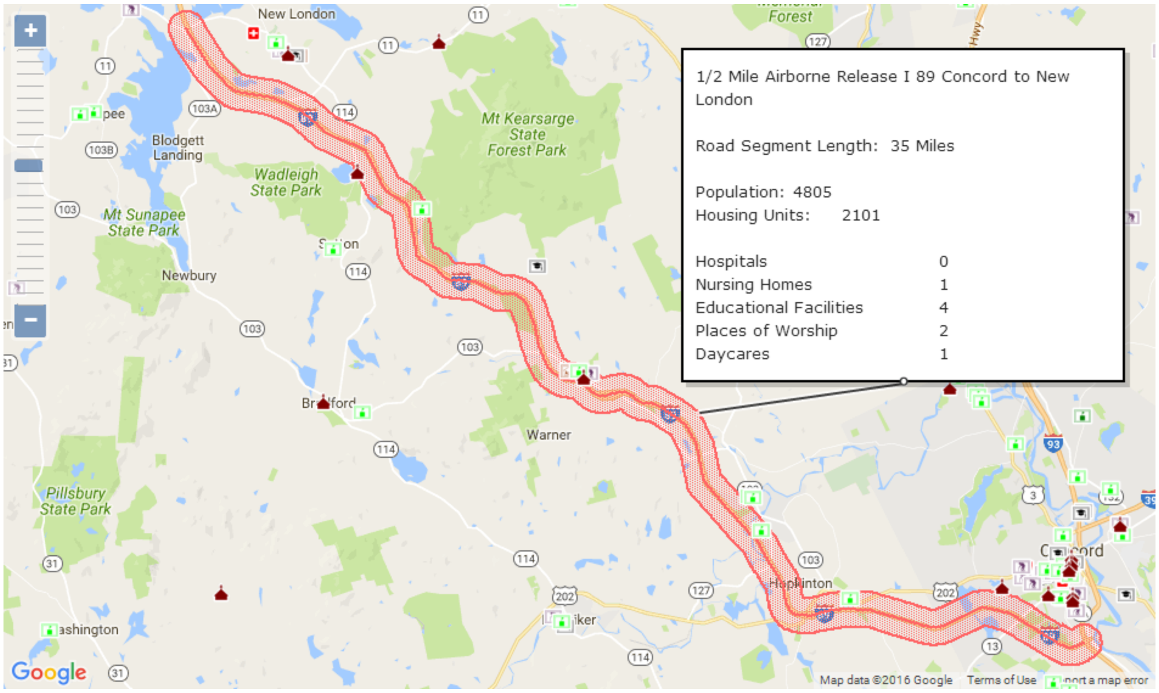
Interstate 89 Concord to New London



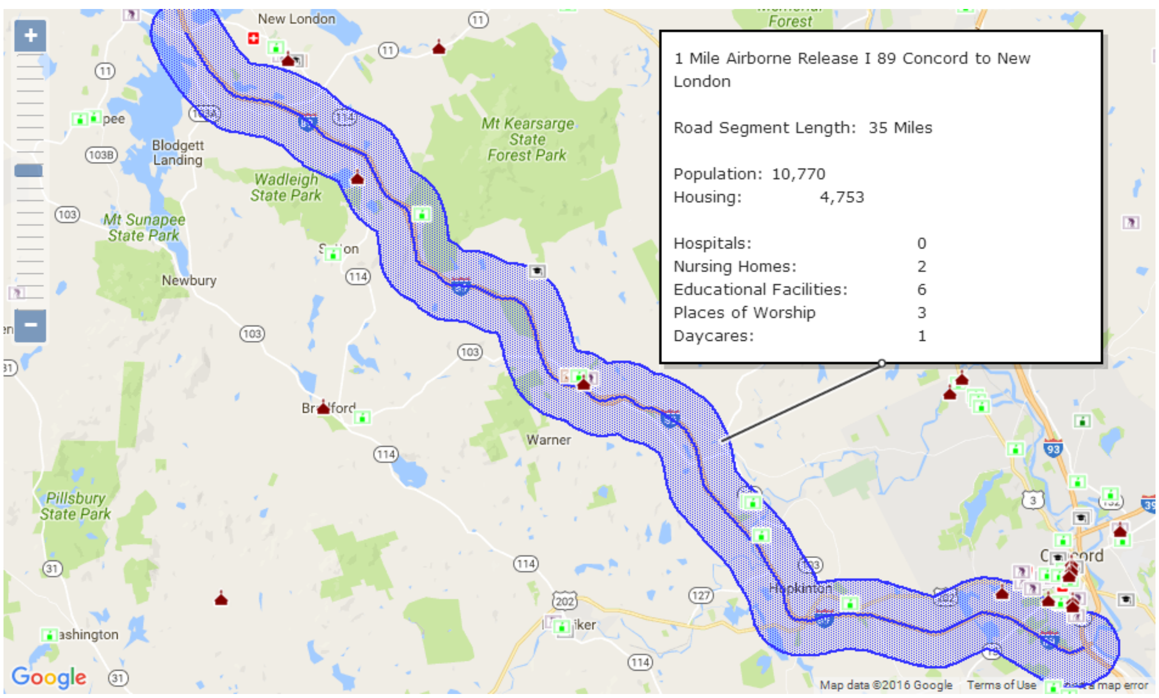
¼ Mile Spill Release with Sensitive Environmental Receptors Identified



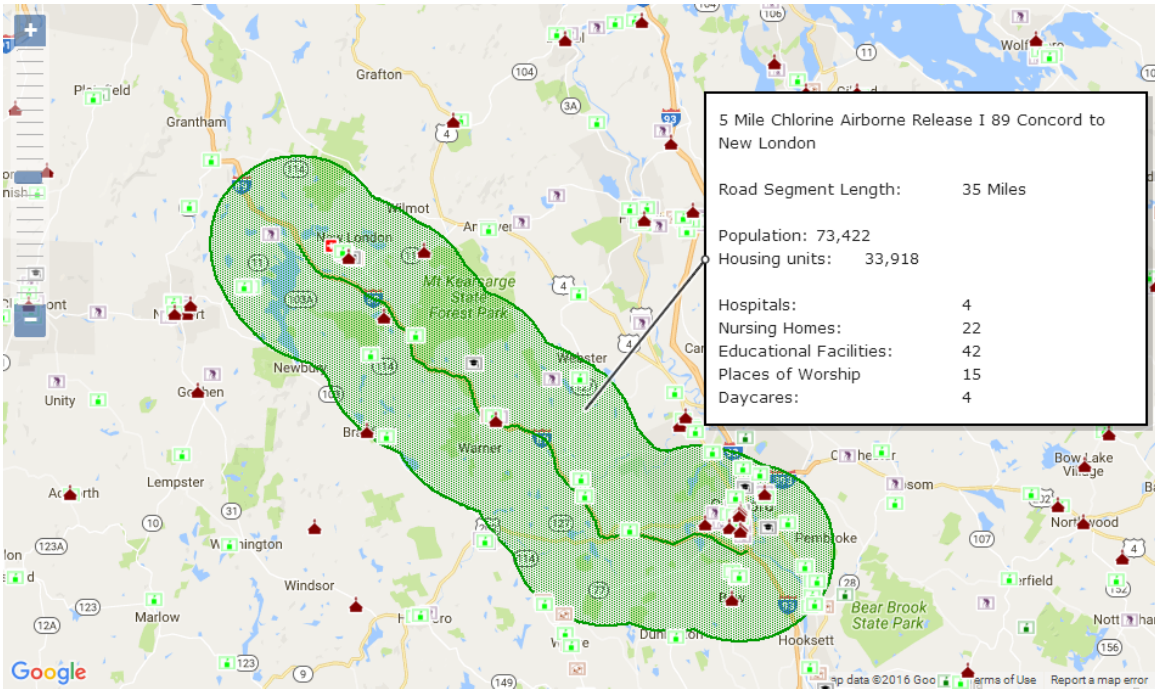
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

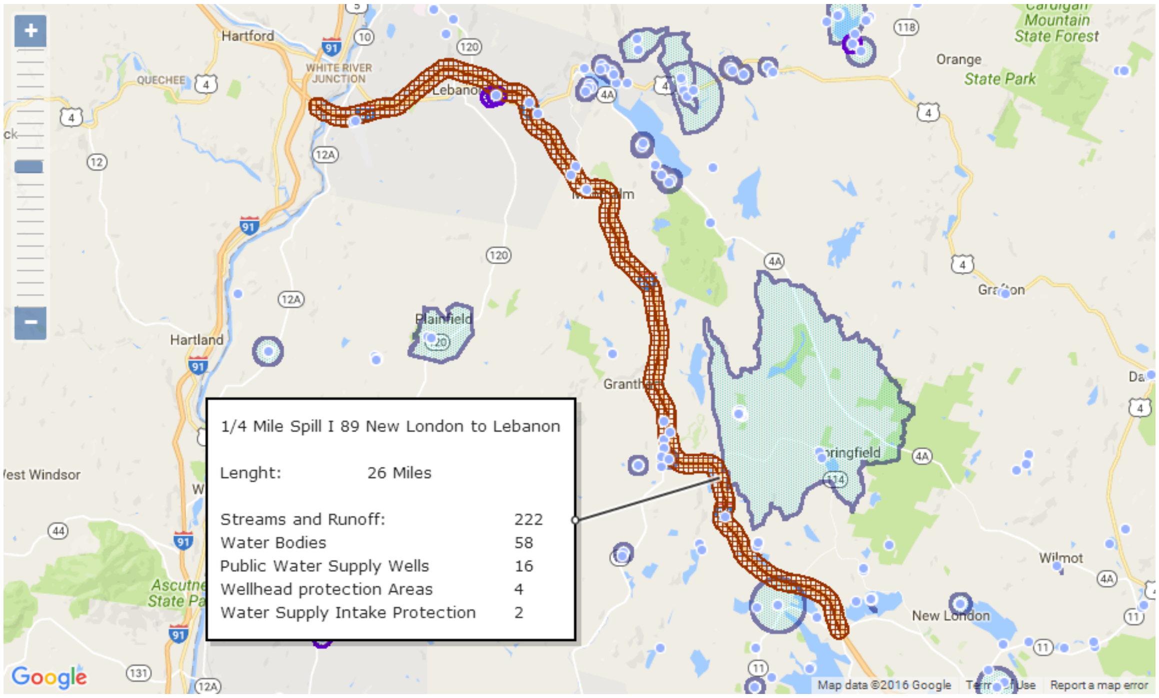


1 Mile Airborne Release with Susceptible Population Receptors

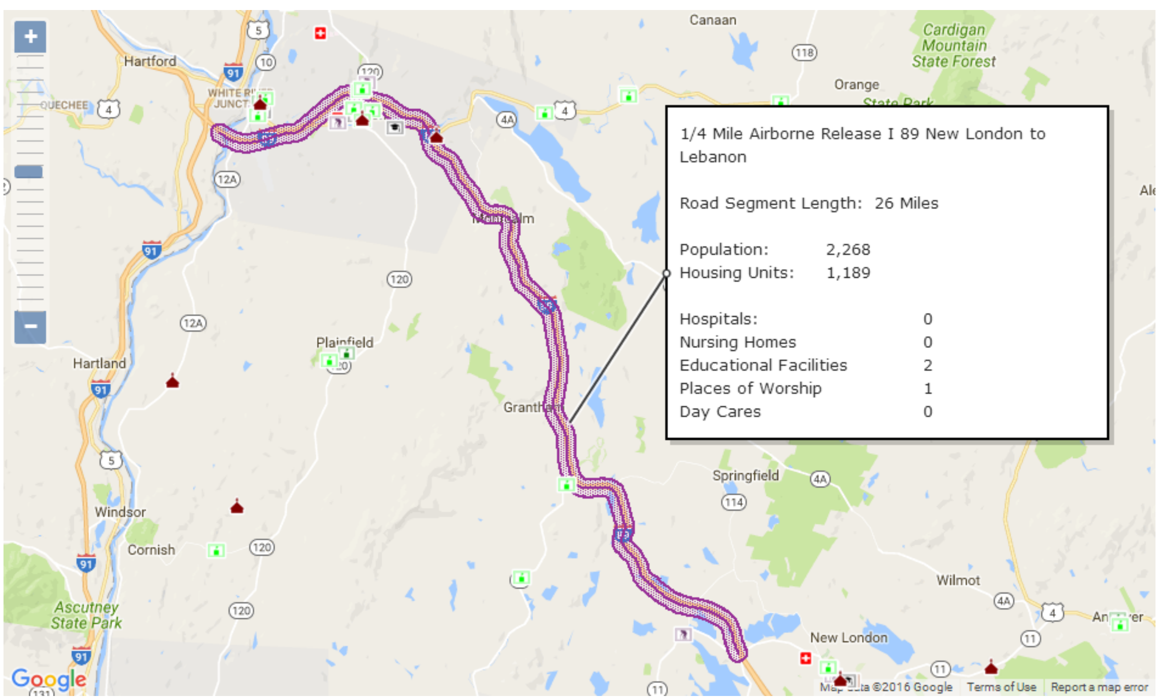


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

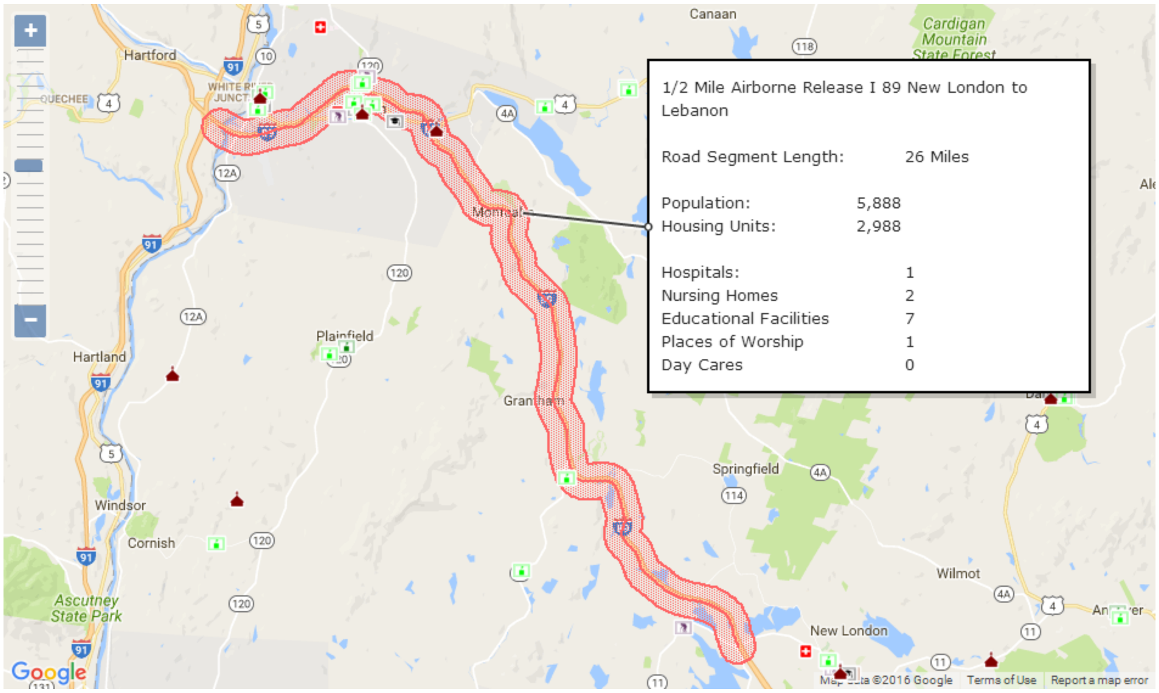
Interstate 89 New London to Lebanon



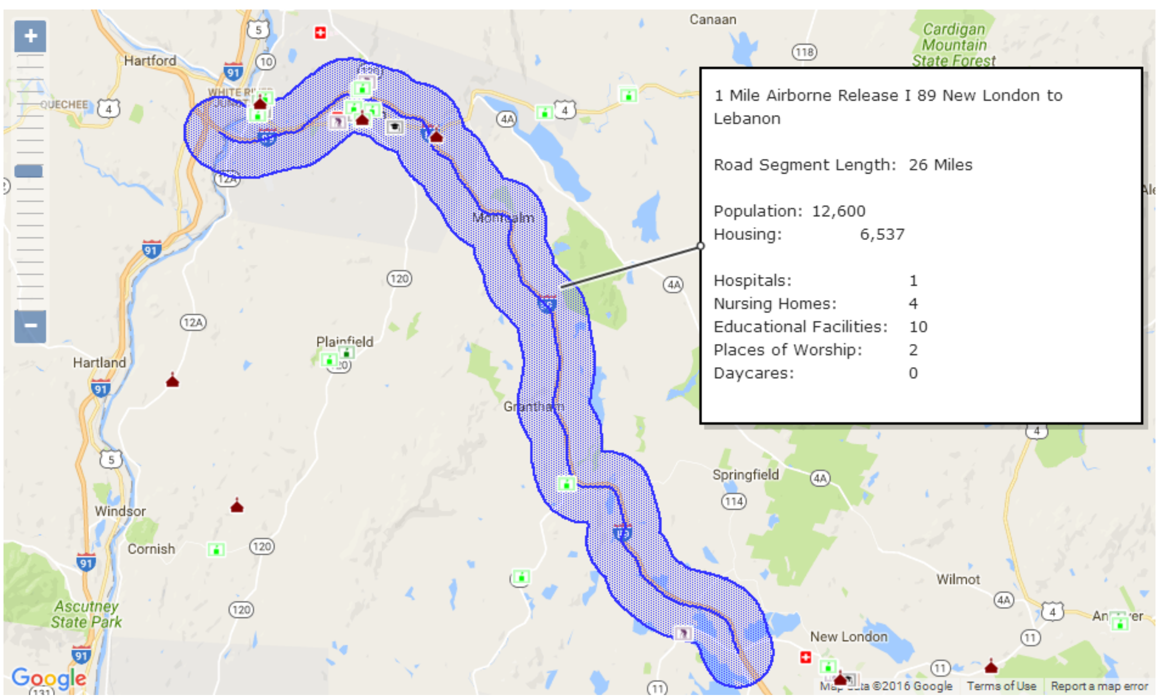
¼ Mile Spill Release with Sensitive Environmental Receptors Identified



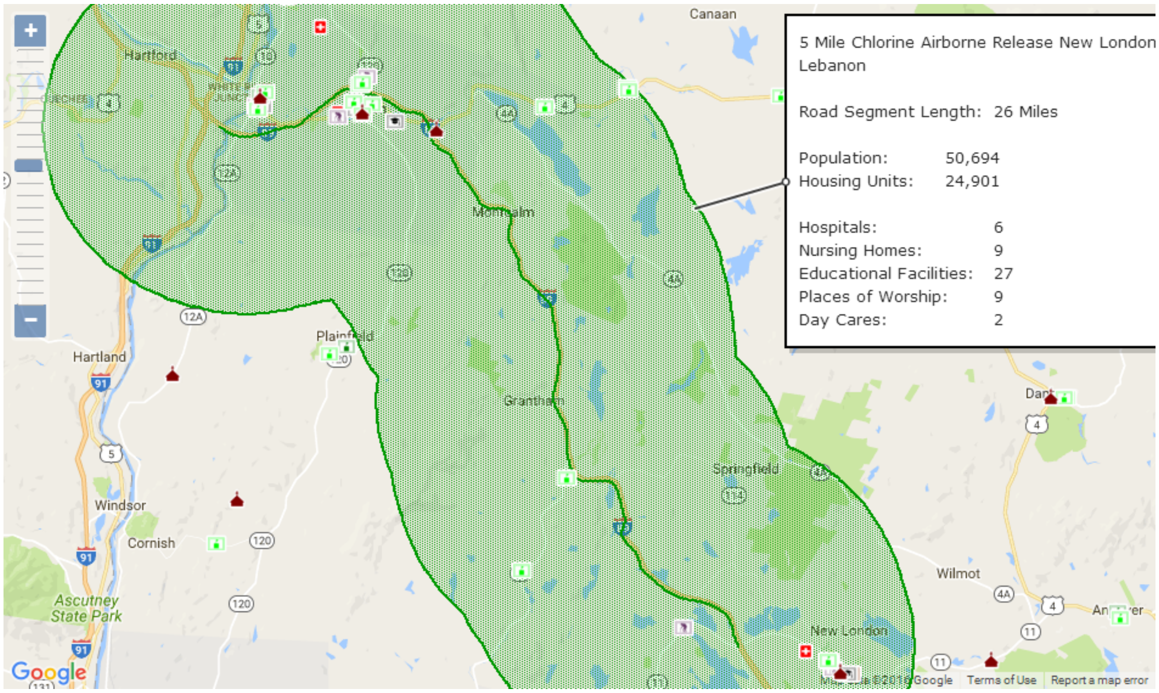
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors

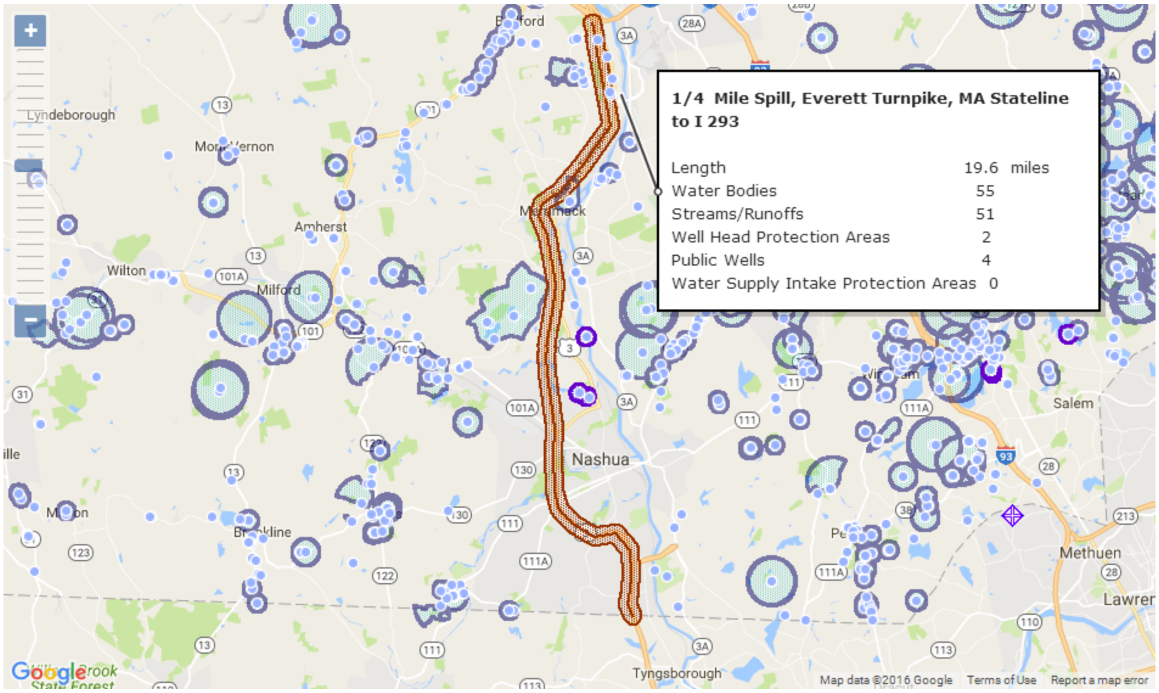


1 Mile Airborne Release with Susceptible Population Receptors

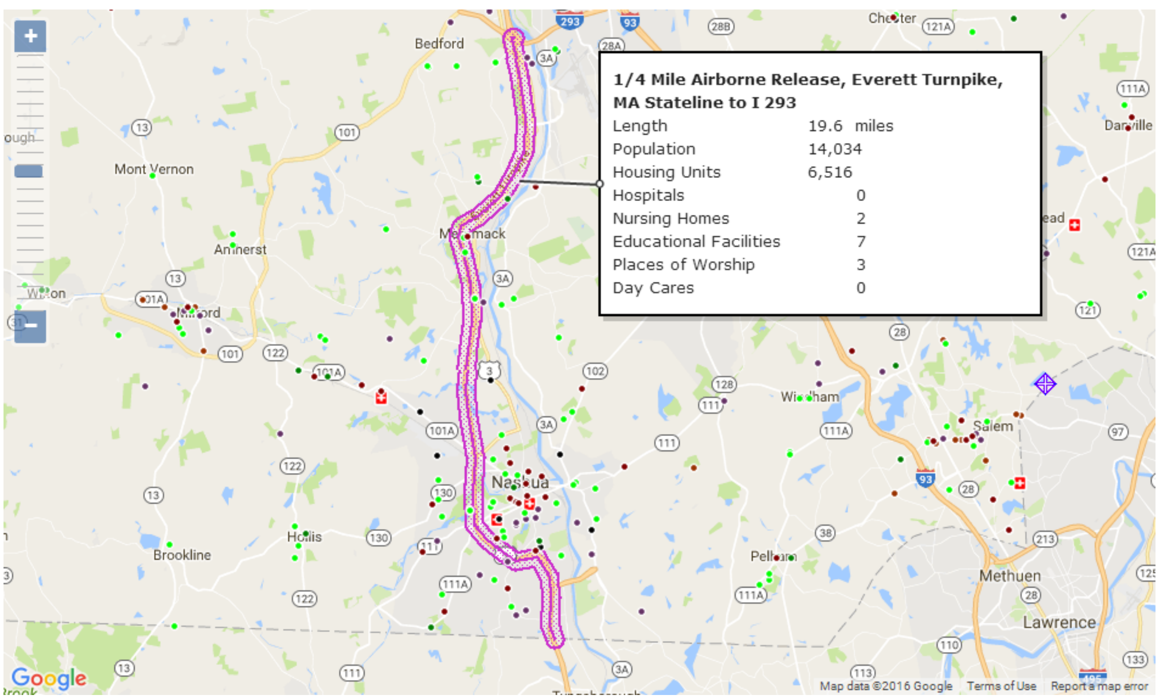


5 Mile Airborne Chlorine Release with Susceptible Population Receptors

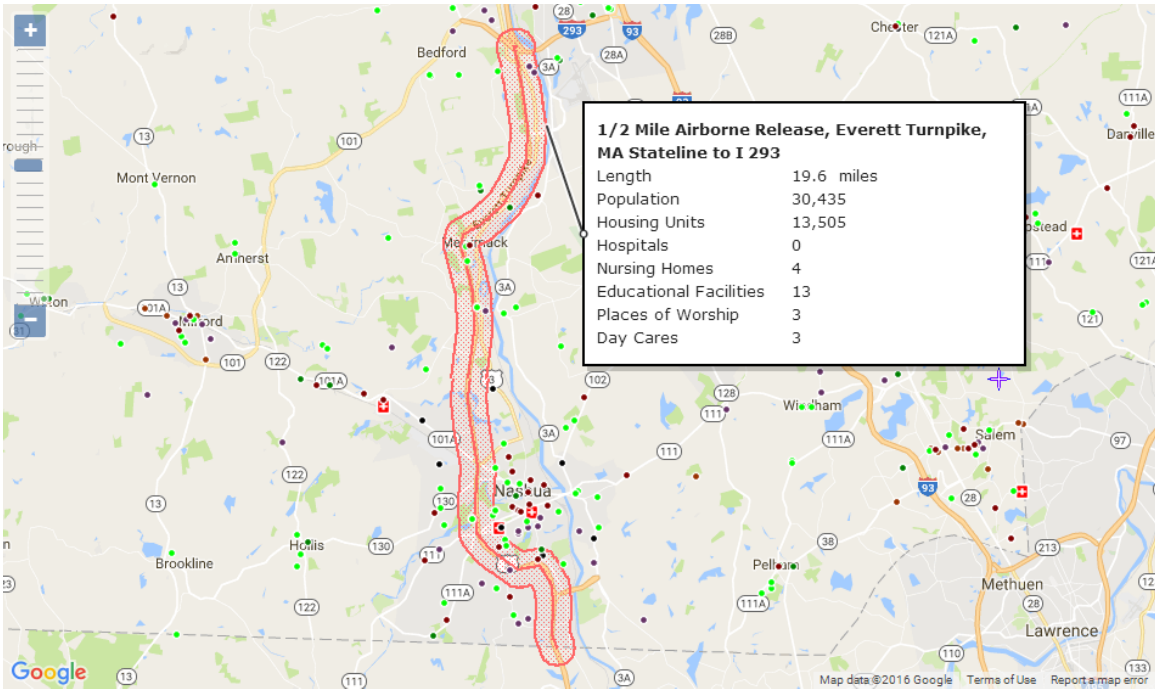
Everett Turnpike Massachusetts Stateline to Manchester



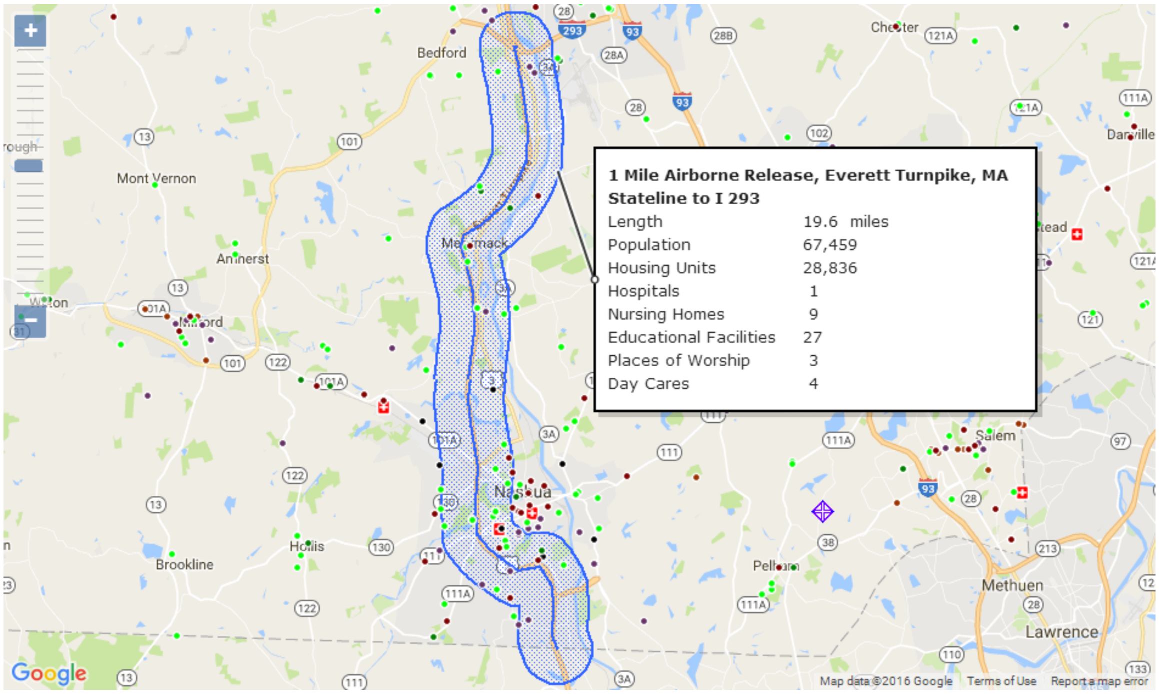
¼ Mile Spill Release with Sensitive Environmental Receptors Identified



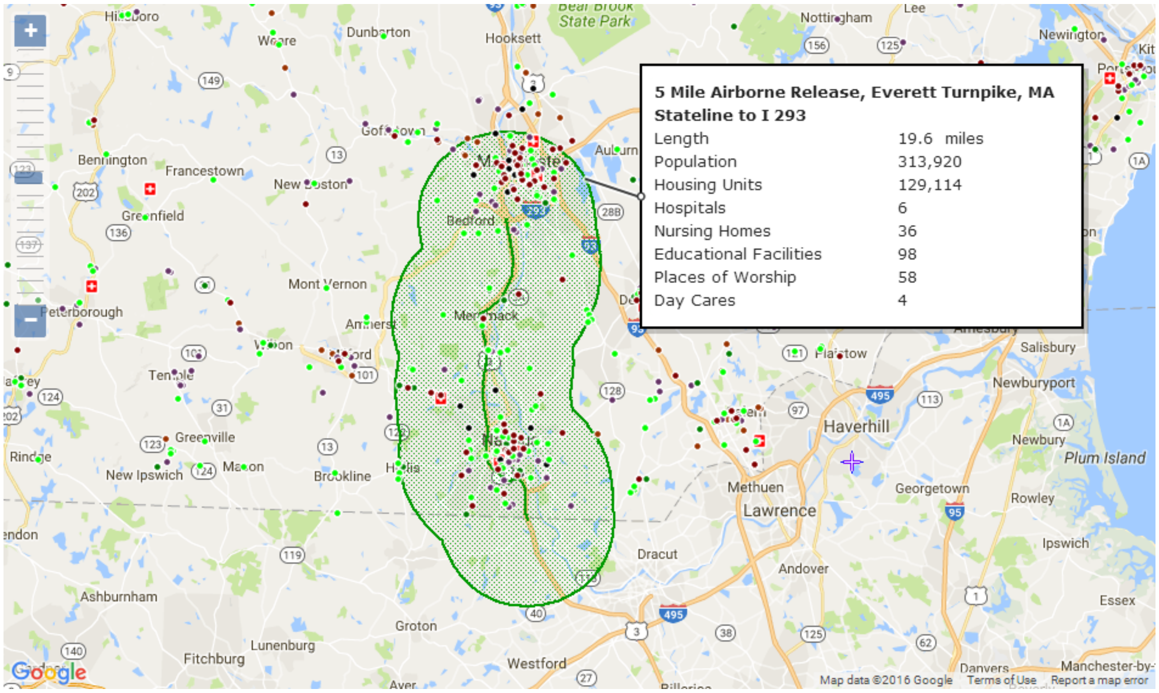
¼ Mile Airborne Release with Susceptible Population Receptors



½ Mile Airborne Release with Susceptible Population Receptors



1 Mile Airborne Release with Susceptible Population Receptors



5 Mile Chlorine Release with Susceptible Population Receptors

Recommendations

The following recommendations are strategies to improve hazardous materials planning and response in New Hampshire.

The State of New Hampshire State Emergency Response Commission (SERC), which is a function of the Advisory Council on Emergency Preparedness and Security, should more clearly define the coverage area for Regional Emergency Planning Committees (REPC) and establish goals for those committees.

Local/Regional Emergency Planning Districts and Community Emergency Management Directors should work closely with facilities that store, transport and use hazardous materials, to identify chemicals which could possess a risk to susceptible populations and first responders. Attention should be focused on Extremely Hazardous Substances and airborne toxics such as Ammonia and Chlorine.

Local First Responders should be familiar with and tour facilities which store, transport and use hazardous materials at least annually to become familiar with the hazards, facility operations and protocols.

Effective plans should be drafted for recognized Local and or Regional Emergency Planning Committees (L/REPC) which focus on defining roles and responsibilities and also identify facilities and transportation routes in harmony with the Emergency Planning and Community Right to Know Act.

Planning for evacuation and shelter in place should focus on specific facilities which could pose a significant hazard to the local community if hazardous materials are released into the atmosphere.

A focus on robust Local Emergency Operations Plans for communities would only serve to strengthen Regional Planning initiatives for hazardous materials emergencies.

In conjunction with active Local/Regional Emergency Planning Committees (L/REPC), local hospitals and healthcare facilities should train, prepare and exercise activities that focus on treatment and response to injuries for hazardous materials.

Once the REPC's are more adequately defined, and transportation routes are clearly identified, then it is practical to initiate more comprehensive hazard and vulnerability assessments region wide.

The purpose of these assessments is to identify susceptible populations within the L/REPC's which could be affected if a hazardous material were to be released.

- Identification of Initial Isolation Zones should be a priority for each facility
- Perform probability of release assessments

- Complete screening and scenarios using industry recognized software programs such as CAMEO and ALOHA to ensure the most practical worst case scenarios are developed for identified facilities.
- Conduct community wide risk assessments by combining the probability and severity indicators for each facility and source.
- Prioritize training and planning for response to high risk facilities that are identified with the assessment process
- By encouraging participation in an active L/REPC industry, along with first responders and other community stakeholders, should prepare strategies, tactics and procedures to reduce the impact and consequences of a hazardous materials release at a chosen location.
- Identify needed training for first responders and upgrades to community response within the scope of the hazard assessments with a direction toward identifying gaps in those areas.

L/REPCs and community Emergency Managers should reference the following document to assist with planning for hazardous materials emergencies. Technical Guidance for Hazards Analysis. Emergency Planning for Extremely Hazardous Substances. US EPA, FEMA, US DOT.

APPENDIX A

VULNERABLE RECEPTORS

Vulnerable Receptors

Everett Turnpike, MA Stateline to Interstate 293, Manchester

Length- 19.6 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	14,034	6,516	0	2	7	3	0	55	51	2	4	0
1/4 Mile Airborne Release	14,034	6,516	0	2	7	3	0					
1/2 Mile Airborne Release	30,435	13,505	0	4	13	3	0					
1 Mile Airborne Release	67,459	28,836	1	9	27	7	0					
5 Mile Airborne Release	313,920	129,114	6	36	98	58	4					

Vulnerable Receptors

Interstate 89 - Concord to New London

Length- 35 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	1,579	661	0	0	0	1	0	102	160	18	29	0
1/4 Mile Airborne Release	1,579	661	0	0	0	1	0					
1/2 Mile Airborne Release	4,805	2,101	0	1	4	2	1					
1 Mile Airborne Release	10,700	4,753	1	4	10	2	0					
5 Mile Airborne Release	73,422	33,918	4	22	42	15	4					

Vulnerable Receptors

Interstate 89 - New London to Lebanon

Length- 26 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	2,268	1,189	0	0	2	1	0	58	222	4	16	2
1/4 Mile Airborne Release	2,268	1,189	0	0	2	1	0					
1/2 Mile Airborne Release	5,888	2,988	1	2	7	1	0					
1 Mile Airborne Release	12,600	6,537	1	4	10	2	0					
5 Mile Airborne Release	50,694	24,901	6	9	27	9	2					

Vulnerable Receptors

Interstate 93 - Concord to Plymouth

Length- 46.5 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	4,033	1,850	0	0	6	1	0	100	204	24	50	1
1/4 Mile Airborne Release	4,033	1,850	0	0	6	1	0					
1/2 Mile Airborne Release	14,247	6,476	0	6	12	6	0					
1 Mile Airborne Release	24,627	10,292	1	6	16	6	1					
5 Mile Airborne Release	109,606	49,720	5	35	64	25	5					

Vulnerable Receptors

Interstate 93 - Plymouth to VT Stateline

Length- 50 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	2,483	1,736	1	1	8	1	2	69	302	22	29	0
1/4 Mile Airborne Release	2,483	1,736	1	1	8	1	2					
1/2 Mile Airborne Release	5,227	3,358	1	3	12	2	4					
1 Mile Airborne Release	12,796	7,500	1	4	16	4	4					
5 Mile Airborne Release	29,932	18,871	2	5	24	8	8					

Vulnerable Receptors

Interstate 93/293 - Manchester to Concord

Length- 27 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protectio n Areas
1/4 Mile Spill	20,678	9,787	1	2	10	3	0	75	159	17	0	0
1/4 Mile Airborne Release	20,678	9,787	1	2	10	3	0					
1/2 Mile Airborne Release	45,540	21,295	2	9	17	6	0					
1 Mile Airborne Release	100,372	44,876	2	20	34	31	1					
5 Mile Airborne Release	223,043	94,183	6	44	82	49	14					

Vulnerable Receptors

Interstate 93, MA Stateline to Manchester

Length- 18.9 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	4,688	1,958	0	0	0	0	1	75	114	13	17	0
1/4 Mile Airborne Release	4,688	1,958	0	0	0	0	1					
1/2 Mile Airborne Release	13,911	5,729	0	2	4	1	2					
1 Mile Airborne Release	36,462	14,783	0	6	8	3	5					
5 Mile Airborne Release	357,385	141,922	5	31	71	17	17					

Vulnerable Receptors

Interstate 95, MA Stateline to ME Stateline

Length- 16 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	2,952	1,384	1	0	2	0	0	69	185	15	7	0
1/4 Mile Airborne Release	2,952	1,384	1	0	2	0	0					
1/2 Mile Airborne Release	9,877	4,691	1	0	3	1	0					
1 Mile Airborne Release	24,076	11,860	1	1	4	9	1					
5 Mile Airborne Release	125,762	62,700	2	16	29	15	2					

Vulnerable Receptors

New Hampshire Route 101, Hampton to Manchester

Length- 31.1 Miles

Layer	Population	Housing Units	Hospitals	Nursing Homes	Educational Facilities	Places of Worship	Day Care Facilities	Water Bodies	Streams Runoffs	Well Head Protection Areas	Public Wells	Water Supply Intake Protection Areas
1/4 Mile Spill	3,777	1,545	0	0	0	0	2	98	235	29	36	0
1/4 Mile Airborne Release	3,777	1,545	0	0	0	0	2					
1/2 Mile Airborne Release	10,954	4,410	0	2	1	2	2					
1 Mile Airborne Release	25,576	10,700	1	7	8	6	5					
5 Mile Airborne Release	222,683	97,947	4	37	82	49	11					

APPENDIX B

VISUAL SURVEY RESULTS DATA

Date	Location	Hazard Class	ID #	Truck Size
3/4/2015	Rte 4/125	Class 8 Corrosives		18 Wheel Box
3/4/2015	Rte 4/125	Class 2 Flammable Gases		6 Wheel Box
3/4/2015	Rte 4/125	Class 2 Flammable Gases		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 2 Flammable Gases		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 2 Non-Flammable Gases		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 5 Oxidizers		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 4 Flammable Solids	4.1	6 Wheel Box
3/6/2015	I89 at 12 New London	Class 3 Flammable Liquids		18 Wheel tank
3/6/2015	I89 at 12 New London	Class 2 Flammable Gases		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 2 Non-Flammable Gases		6 Wheel Box
3/6/2015	I89 at 12 New London	Class 3 Flammable Liquids		18 Wheel tank
3/12/2015	I89 at 12 New London	Class 5 Oxidizers		18 Wheel tank
3/13/2015	Rte 4/16 Dover	Class 8 Corrosives		6 Wheel Box
3/13/2015	Rte 4/16 Dover	Class 4 Flammable Solids	4.2	18 Wheel Box
3/13/2015	Rte 4/16 Dover	Class 2 Non-Flammable Gases		6 Wheel Box
3/13/2015	95 N Portsmouth	Class 2 Flammable Gases		18 Wheel tank
3/13/2015	95 N Portsmouth	Class 8 Corrosives		18 Wheel Box
3/13/2015	95 N Portsmouth	Class 4 Flammable Solids	4.1	18 Wheel Box
3/13/2015	95 S Portsmouth	Class 2 Flammable Gases	1075	18 Wheel Box
3/13/2015	95 S Portsmouth	Class 2 Non-Flammable Gases		18 Wheel tank
3/13/2015	95 S Portsmouth	Class 5 Oxidizers	LOX	18 Wheel tank
3/13/2015	95 S Portsmouth	Class 5 Oxidizers		18 Wheel Box
3/25/2015	93 N Concord	Class 9 Misc.		18 Wheel Box
3/25/2015	93 N Concord	Class 9 Misc.		18 Wheel Box
3/25/2015	93 S Concord	Class 2 Flammable Gases	1075	18 Wheel Box
3/25/2015	93 S Concord	Class 2 Flammable Gases	1075	18 Wheel Box
3/25/2015	93 S Concord	Class 2 Flammable Gases	LNG	18 Wheel tank
3/30/2015	393 Concord	Dangerous		18 Wheel Box
3/30/2015	93 NB Bow	Class 3 Flammable Liquids		18 Wheel Box
3/30/2015	93 NB Hooksett	Class 3 Flammable Liquids		18 Wheel Box
3/30/2015	Bedford toll NB	Class 8 Corrosives		18 Wheel Box
3/30/2015	Bedford toll NB	Class 8 Corrosives		18 Wheel Box
3/30/2015	Bedford toll SB	Class 5 Oxidizers		18 Wheel Box
3/30/2015	Bedford toll NB	Class 8 Corrosives		18 Wheel Box
3/30/2015	Bedford toll NB	Class 2 Flammable Gases	1075	18 Wheel Box
3/30/2015	Bedford toll NB	Class 5 Oxidizers	1073	6 Wheel Box
3/30/2015	93 Bow rest area	Class 3 Flammable Liquids		18 Wheel Box
3/30/2015	93 SB at 13	Class 2 Flammable Gases	CNG	18 Wheel tank

Date	Location	Hazard Class	ID #	Truck Size
3/31/2015	93 SB Bow	Class 1 Explosives	1.4	18 Wheel Box
3/31/2015	101 WB at 2	Class 8 Corrosives		18 Wheel Box
3/31/2015	101 EB at 2	Class 6 Toxics		18 Wheel Box
3/31/2015	101 EB at 2	Class 6 Toxics	6.2	6 Wheel Box
3/31/2015	101 EB at 2	Class 5 Oxidizers	5.2	18 Wheel Box
3/31/2015	101 EB at 2	Class 3 Flammable Liquids		18 Wheel Box
3/31/2015	101EB at 2	Class 8 Corrosives		18 Wheel Box
4/3/2015	93 NB @ 16	Class 3 Flammable Liquids	1203	18 Wheel tank
4/3/2015	93 NB @ 18	Class 2 Flammable Gases	1075	6 Wheel Box
4/3/2015	101 EB at 3	Class 8 Corrosives		18 Wheel Box
4/15/2015	93 @ 12	Class 1 Explosives		18 Wheel Box
4/15/2015	101 WB at 7	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/15/2015	101 EB at 7	Class 3 Flammable Liquids		18 Wheel Box
4/15/2015	95 sb at tolls	Class 2 Flammable Gases	CNG	18 Wheel tank
4/15/2015	101 @ 95 NB	Class 2 Flammable Gases	CNG	18 Wheel tank
4/15/2015	95 SB Hampton	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/15/2015	95 SB Hampton	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/15/2015	95 SB Hampton	Class 2 Flammable Gases	1977	18 Wheel tank
4/15/2015	95 @ 33	Class 4 Flammable Solids		6 Wheel Box
4/15/2015	95 NB Portsmouth	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/15/2015	95 NB Portsmouth	Class 8 Corrosives		18 Wheel tank
4/15/2015	95 SB Portsmouth	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/15/2015	95 SB Portsmouth	Class 2 Flammable Gases	CNG	18 Wheel tank
4/15/2015	95 NB Portsmouth	Class 8 Corrosives		18 Wheel Box
4/20/2015	93 NB @ Hooksett	Class 2 Flammable Gases	1075	18 Wheel Box
4/20/2015	93 SB Derry	Class 3 Flammable Liquids		6 Wheel Box
4/20/2015	93 SB Derry	Class 8 Corrosives		
4/21/2015	93 NB Bow	Class 8 Corrosives		18 Wheel tank
4/21/2015	93 SB Bow	Class 2 Non-Flammable Gases	co2	6 Wheel Tank
4/21/2015	93 SB Bow	Class 3 Flammable Liquids		18 Wheel Box
4/21/2015	93 NB Bow	Class 8 Corrosives		18 Wheel Box
4/22/2015	Rte 106 Concord	Class 8 Corrosives	1791	18 Wheel Box
4/22/2015	Rte 106 Concord	Class 8 Corrosives		18 Wheel Box
4/23/2015	93 NB Bow	Class 2 Flammable Gases	CNG	18 Wheel tank
4/23/2015	93 NB Bow	Class 8 Corrosives		18 Wheel tank
4/23/2015	93 NB Bow	Class 2 Flammable Gases	CNG	18 Wheel tank
4/23/2015	101 WB Raymond	Class 5 Oxidizers		6 Wheel Box

Date	Location	Hazard Class	ID #	Truck Size
4/24/2015	Rt 95N Seabrook	Class 5 Oxidizers	1073	18 Wheel Tank
4/24/2015	Rt 95N Seabrook	Class 2 Non-Flammable Gases		10 Wheel Box
4/24/2015	Rt 95N Seabrook	Class 8 Corrosives		18 Wheel Box
4/24/2015	Rt 95N Seabrook	Class 8 Corrosives		18 Wheel Box
4/24/2015	93 SB Ashland	Class 2 Flammable Gases	1049	18 Wheel tank
4/29/2015	93 NB Bow	Class 2 Flammable Gases	1075	18 Wheel Box
4/29/2015	93 NB Derry	Class 3 Flammable Liquids		18 Wheel Box
4/29/2015	93 SB Salem	Class 2 Non-Flammable Gases		18 Wheel Box
4/29/2015	93 SB Salem	Class 2 Non-Flammable Gases	1977	18 Wheel tank
4/29/2015	93 SB Salem	Class 5 Oxidizers	LOX	18 Wheel tank
4/29/2015	93 SB Salem	Class 8 Corrosives		18 Wheel Box
4/29/2015	93 NB Salem	Class 2 Flammable Gases		18 Wheel Box
4/29/2015	93 NB Salem	Class 2 Non-Flammable Gases		18 Wheel Box
4/29/2015	93 NB Salem	Class 6 Toxics		18 Wheel tank
4/29/2015	93 SB Salem	Class 2 Non-Flammable Gases		18 Wheel tank
4/30/2015	101 W Stratham	Class 1 Explosives		6 Wheel Box
5/3/2015	Rt 16 S Rochester	Class 8 Corrosives		18 Wheel Box
5/12/2015	293 Manchester	Class 2 Non-Flammable Gases		6 Wheel Box
5/12/2015	Everett Trpk Bedford	Class 2 Non-Flammable Gases	1977	18 Wheel tank
5/12/2015	Everett Trpk Bedford	Class 3 Flammable Liquids		18 Wheel Box
5/12/2015	Everett Trpk Bedford	Class 8 Corrosives		18 Wheel Box
5/12/2015	Everett Trpk Bedford	Class 8 Corrosives		18 Wheel Box
5/12/2015	Everett Trpk Bedford	Class 8 Corrosives		18 Wheel Box
5/22/2015	Rt 16 N Ossipee	Class 2 Flammable Gases		10 Wheel Box
27-May	93 NB Concord	Class 2 Flammable Gases	CNG	18 Wheel tank
27-May	93 NB Concord	Class 2 Flammable Gases	1075	6 Wheel Box
27-May	3A Bow	Class 8 Corrosives		18 Wheel tank
6/1/2015	Rte 3 Meredith	Class 1 Explosives		6 Wheel Box
6/3/2015	93 NB Hooksett	Class 2 Flammable Gases		6 Wheel Box
6/3/2015	93 NB Hooksett	Class 2 Non-Flammable Gases		6 Wheel Box
6/3/2015	93 NB Hooksett	Class 8 Corrosives		18 Wheel tank
6/3/2015	93 NB Londonderry	Class 3 Flammable Liquids		18 Wheel Box
6/3/2015	93 NH Windham	Class 8 Corrosives		18 Wheel Box
6/3/2015	Rte 111 Windham	Class 3 Flammable Liquids		18 Wheel Box
6/3/2015	Rte 111 Windham	Class 5 Oxidizers		18 Wheel Box
6/3/2015	Rte 111 Windham	Class 8 Corrosives		18 Wheel Box
6/3/2015	93 SB Manchester	Class 2 Non-Flammable Gases		6 Wheel Box
6/3/2015	93 SB Manchester	Class 2 Flammable Gases		6 Wheel Box
6/3/2015	93 SB Manchester	Class 2 Flammable Gases	1075	18 Wheel Box
6/3/2015	93 SB Hooksett	Class 2 Flammable Gases	CNG	18 Wheel Box
6/3/2015	93 SB Hooksett	Class 2 Flammable Gases	CNG	18 Wheel Box

Date	Location	Hazard Class	ID #	Truck Size
6/12/2015	Rt 93 N Hooksett	Class 2 Toxic Gases	1005	18 Wheel Tank
6/14/2015	Rt 16 S Rochester	Class 8 Corrosives		18 Wheel Box
6/15/2015	93 N Londonderry	Class 8 Corrosives		18 Wheel Box
6/15/2015	Rt 93 S Windham	Class 2 Flammable Gases		10 Wheel Box
6/19/2015	Rt 95N Seabrook	Class 3 Flammable Liquids		18 Wheel Box
6/19/2015	Rt 95N Seabrook	Class 8 Corrosives		18 Wheel Tank
6/23/2015	93 N Londonderry	Class 2 Non-Flammable Gases		10 Wheel Box
6/23/2015	93 N Londonderry	Class 2 Flammable Gases		10 Wheel Box
6/23/2015	93 N Londonderry	Class 3 Flammable Liquids		18 Wheel Box
6/23/2015	93 N Bow	Class 4 Flammable Solids		18 Wheel Box
6/23/2015	93 N Bow	Class 8 Corrosives		18 Wheel Box
6/23/2015	93 N Bow	Class 8 Corrosives		18 Wheel Box
6/23/2015	93 N Hooksett	Class 8 Corrosives		18 Wheel Box
6/23/2015	93 N Hooksett	Class 8 Corrosives		18 Wheel Box
6/23/2015	93 N @ Rt 101	Dangerous		18 Wheel Box
7/7/2015	Rt 93 S Windham	Class 1 Explosives		18 Wheel Tank
7/7/2015	Rt 93 S Windham	Class 8 Corrosives		18 Wheel Box
7/7/2015	Rt 93 S Windham	Class 8 Corrosives		18 Wheel Box
7/7/2015	93 SB Bow	Class 3 Flammable Liquids		18 Wheel Box
7/7/2015	93 NB Bow	Class 2 Toxic Gases	?	18 Wheel Box
7/7/2015	93 NB Bow	Class 5 Oxidizers	?	18 Wheel Box
7/7/2015	93 NB Bow	Class 3 Flammable Liquids		18 Wheel Box
7/14/2015	93 N Londonderry	Class 3 Flammable Liquids		18 Wheel Box
7/14/2015	93 N Londonderry	Class 3 Flammable Liquids		18 Wheel Tank
7/16/2015	93 NB Bow	Class 8 Corrosives		18 Wheel Box
7/16/2015	93 SB Bow	Class 2 Flammable Gases	CNG	18 Wheel tank
7/16/2015	93 NB Bow	Class 1 Explosives		6 Wheel Box
7/23/2015	93 N Londonderry	Class 5 Oxidizers		18 Wheel Box
7/23/2015	Rt 3 S Bedford	Class 2 Toxic Gases	1017	10 Wheel Box
7/23/2015	Rt 111 Windham	Class 1 Explosives		18 Wheel Tank
7/26/2015	Rt 89 Lebanon	Class 2 Flammable Gases	CNG	18 Wheel tank
7/28/2015	Rt 93 N Manchester	Class 2 Flammable Gases	1954	18 Wheel Tank
8/5/2015	95 NB Portsmouth	Class 8 Corrosives		18 Wheel Box
8/5/2015	95 SB Portsmouth	Class 8 Corrosives		18 Wheel Box
8/5/2015	95 SB Portsmouth	Class 8 Corrosives		18 Wheel Box
8/5/2015	95 SB Portsmouth	Class 8 Corrosives		18 Wheel Box
8/5/2015	95 SB Portsmouth	Class 8 Corrosives		18 Wheel Box
8/5/2015	Rte 16 NB Dover	Class 2 Non-Flammable Gases	1977	18 Wheel tank
8/5/2015	95 N Portsmouth	Class 2 Non-Flammable Gases	1977	18 Wheel tank
8/5/2015	95 N Portsmouth	Class 2 Non-Flammable Gases	1977	
8/5/2015	95 N Portsmouth	Class 8 Corrosives		18 Wheel tank
8/5/2015	101 EB	Class 8 Corrosives		18 Wheel tank

Date	Location	Hazard Class	ID #	Truck Size
8/9/2015	Rt 93 N Windham	Class 8 Corrosives		18 Wheel Box
8/10/2015	Rt 111 Windham	Class 8 Corrosives		18 Wheel Box
8/10/2015	Rt 111 Windham	Class 2 Non-Flammable Gases		10 Wheel Box
8/11/2015	93 NB Concord	Class 9 Misc.		18 Wheel Box
8/11/2015	93 S Bow	Class 8 Corrosives		18 Wheel tank
8/11/2015	89 S Bow	Class 2 Flammable Gases	1966	18 Wheel tank
8/17/2015	293 NB Manchester	Class 3 Flammable Liquids		18 Wheel Box
8/17/2015	293 NB Manchester	Class 8 Corrosives		18 Wheel Box
8/17/2015	93 S Hooksett	Class 2 Flammable Gases	1966	18 Wheel tank
8/17/2015	93 S Hooksett	Class 8 Corrosives		18 Wheel tank
8/17/2015	93 S bow	Class 2 Flammable Gases	CNG	18 Wheel tank
8/17/2015	93 N Bow	Class 2 Flammable Gases	CNG	18 Wheel tank
8/17/2015	93 N Hooksett	Class 5 Oxidizers	LOX	18 Wheel tank
8/17/2015	93 S Bow	Class 8 Corrosives		18 Wheel Box
8/17/2015	93/293	Class 2 Flammable Gases		6 Wheel Box
8/18/2015	Rt 93 S Windham	Class 8 Corrosives		18 Wheel tank
8/19/2015	Rt 93 N Bow	Class 5 Oxidizers	LOX	18 Wheel tank
8/19/2015	Rt 93 N Bow	Class 8 Corrosives		18 Wheel Box
8/19/2015	Rt 93 N Manchester	Class 8 Corrosives		6 Wheel Box
8/19/2015	Rt 293/Rt 93 NB	Class 3 Flammable Liquids		18 Wheel Box
8/19/2015	Rt 93 NB Hooksett	Class 8 Corrosives		18 Wheel Box
8/19/2015	Rt 93 N Bow-89 N	Class 9 Misc.		18 Wheel Box
8/19/2015	Rt 93 N Bow-89 N	Dangerous		
8/19/2015	Rt 89 Concord	Class 3 Flammable Liquids		
8/19/2015	Rt 89 Concord	Class 4 Flammable Solids		
8/19/2015	Rt 89 Concord	Class 8 Corrosives		
8/19/2015	Rt 89 Concord	Class 2 Flammable Gases		6 Wheel Box
8/19/2015	Rt 93 N Bow	Class 2 Non-Flammable Gases		6 Wheel Box
8/19/2015	Rt 93 N Bow	Class 5 Oxidizers	1073	6 Wheel Box
8/19/2015	Rt 93 N Bow	Class 2 Non-Flammable Gases	1977	18 Wheel tank
8/21/2015	Rt 95 N Seabrook	Class 8 Corrosives		18 Wheel Box
8/21/2015	Rt 95 N Seabrook	Class 3 Flammable Liquids		18 Wheel Box
8/25/2015	93 N Londonderry	Class 3 Flammable Liquids		18 Wheel Box
8/25/2015	Rt 93 N Bow	Class 8 Corrosives	2582	18 Wheel tank
8/27/2015	Rt 93 N Manchester	Class 2 Toxic Gases		18 Wheel Box
8/27/2015	Rt 89 S Warner	Class 8 Corrosives		18 Wheel tank

Date	Location	Hazard Class	ID #	Truck Size
9/4/2015	Rt 93 N Bow	Class 4 Flammable Solids	4.2	18 Wheel Box
9/4/2015	Rt 93 N Bow	Class 4 Flammable Solids	4.3	18 Wheel Box
9/4/2015	Rt 93 N Concord	Class 2 Non-Flammable Gases	1005	18 Wheel tank
9/4/2015	Rt 3 Concord	Class 8 Corrosives		18 Wheel tank
9/4/2015	Rt 3 Concord	Class 8 Corrosives		18 Wheel tank
9/4/2015	Rt 293 N Manchester	Class 8 Corrosives		18 Wheel tank
9/4/2015	Rt 293 N Manchester	Class 8 Corrosives		18 Wheel Box
9/9/2015	93 N Londonderry	Class 3 Flammable Liquids	1230	18 Wheel Tank
9/9/2015	Rt 93 N Salem	Class 2 Non-Flammable Gases		10 Wheel Box
9/10/2015	Rt 393 Concord	Class 8 Corrosives		18 Wheel Box
9/10/2015	Rt 93 N Concord	Class 3 Flammable Liquids		18 Wheel Box
9/10/2015	Rt 93 N Concord	Class 2 Flammable Gases	1075	18 Wheel Box
9/11/2015	RT 95 S Hampton	Class 5 Oxidizers	1073	18 Wheel Tank
9/11/2015	RT 95 S Hampton	Class 2 Flammable Gases		18 Wheel Tank
9/11/2015	RT 95 S Hampton	Class 6 Toxics		18 Wheel Box
9/11/15	Rt 93 S Bow	Class 8 Corrosives		18 Wheel tank
9/18/2015	Rt 111 Windham	Class 8 Corrosives	3264	
9/21/2015	Rt 93 N Bow	Class 2 Non-Flammable Gases		10 Wheel Box
9/21/2015	Rt 93 N Bow	Class 2 Non-Flammable Gases		6 Wheel Box
9/22/2015	Rt 93 N Bow	Class 9 Misc.		18 Wheel tank
9/22/2015	Rt 93 S Bow	Class 8 Corrosives		18 Wheel Box
9/22/2015	Rt 93 S Bow	Class 8 Corrosives		18 Wheel Box
9/22/2015	Rt 3 Laconia	Class 2 Flammable Gases	1951	18 Wheel tank
10/1/2015	Rt 93 N Bow	Dangerous		18 Wheel Box
10/1/2015	Rt 93 N Manchester	Class 5 Oxidizers	LOX	18 Wheel tank