VERMONT

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Agency of Natural Resources

Guidance Document

APPENDIX

Section 1 **RESOURCE LISTING FOR PSOC INVENTORY AND ASSESSMENT OF RISK**

Section 2 **LIST OF COMMON POTENTIAL SOURCES OF CONTAMINATION**

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Section 1: RESOURCE LISTING FOR PSOC INVENTORY AND ASSESSMENT OF RISK

The community should verify the accuracy of the data by conducting field surveys and using local knowledge. Not all potential contaminant sources will have available data for mapping, especially those that are unregulated. Many municipalities have the town parcel maps available on the town website and use CAI Technologies interactive mapping tool that allows you to specify and print parcel maps of a specific area.

DRINKING WATER PUBLIC LIBRARY-find water system records archived in the Divisions record database.
https://anrapp.vermont.gov/dwlibrary/

DEC DATA SETS - Environmental records -search for Waste Management (Hazardous Sites, Brownfield Sites, Spills, UST, Hazardous Waste, Solid Waste, Salvage Yards, AST, Dry Cleaners, PFAS Samples), Ground Water Reclassification, and Watershed (Stormwater and Wetlands) data files:
https://anrweb.vt.gov/DEC/ERT/
https://anrweb.vt.gov/DEC/ERT/UST.aspx

The Environmental Consideration Online Tool will let you quickly identify critical features with a 1800 foot radius (549 meters) around the location of your choice. Just enter the address, the latitude and longitude, or zoom to the location and place a pin and hit Submit. This will bring up a table of features within the radius. These features are layers for Public and Private wells, Wetlands, Hazardous Sites, Groundwater Classification areas (II and IV), Source Protection Areas, roads, streams, parcels
https://anrweb.vt.gov/DEC/ECON/map.aspx

DEC SPILL MANAGEMENT:
https://dec.vermont.gov/waste-management/spills#SpillReporting

WASTEWATER REGIONAL OFFICE PERMIT SEARCH:
https://anrweb.vt.gov/DEC/WWDocs/Default.aspx

ANR NR Atlas LAYERS
https://anrmaps.vermont.gov/websites/anra5/

TIER II REPORTS (contact your local Fire Chief or the state EPCRA Program Manager for Tier II reporting facilities in your community):
Patrick McLaughlin EPCRA (Tier II) Program Manager
Cell (802) 585-4468
Email Patrick.Mclaughlin@vermont.gov
https://vem.vermont.gov/programs/epcra

INDIRECT DISCHARGE PERMITS
https://anrweb.vt.gov/DEC/_DEC/FIDP.aspx

VT AGENCY OF AGRICULTURE, FOOD AND MARKETS
Pesticide Program (Permits, Golf Courses, ROW)
https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/pesticide-programs

https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/pesticide-programs/pesticide-permits

FLOOD READY (Flood Maps/Flood Risk/Community Reports):
https://floodready.vermont.gov/

LOCAL KNOWLEDGE AND TOWN CLERK AND OR TOWN PLANNING/ZONING OFFICE.
https://maps.vcgi.vermont.gov/parcelviewer/

Section 2: LIST OF COMMON POTENTIAL SOURCES OF CONTAMINATION

Table: Typical Contaminants from Land Uses / Sources

https://www.oregon.gov/deq/FilterDocs/typcontaminants.pdf**:** Adapted from EPA ; Supplemented with information from Oregon DEQ hazardous waste / water quality databases and Drinking Water Protection citizen's and technical advisory committees

PSOC Help Guide – Information in the help guide originated from the Supplemental Guide III-Potential Sources of Significant Contamination provided by the West Virginia Bureau for Public Health, Source Water Assessment and Protection Program, in collaboration with key stakeholders and partners, July 2015.

Appendix B. Partial List of Potential Sources of Contamination (PSOC) in Vermont. Extracted from the 1997 publication, Protecting Public Water Sources in Vermont

https://dec.vermont.gov/water/drinking-water/public-drinking-water-systems/source-water-protection

Table: POTENTIAL SOURCES OF CONTAMINATION and CONTAMINANTS OF CONCERN

https://www.epa.gov/sites/default/files/2015-08/documents/mgwc-gwc1.pdf

Typical Contaminants from Land Uses / Sources	
Land Use / Facility / Source	*Typical Contaminants [1,2,3]*
Commercial / Industrial	
Automobile Body shops/repair shops	Waste oils; solvents; acids; paints; automotive wastes;[4] miscellaneous cutting oils
Car washes	Soaps; detergents, waxes; miscellaneous chemicals
Gas stations/sumps	Oils; solvents; miscellaneous wastes
Boat Services/repair/refinishing	Diesel fuels; oil; septage from boat waste disposal area; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes[4]
Cement/concrete plants	Diesel fuels; solvents; oils; miscellaneous wastes
Chemical/petroleum processing/storage	Hazardous chemicals; solvents; hydrocarbons; heavy metals; asphalt
Dry cleaners	Solvents (perchloroethylene, petroleum solvents, Freon); spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Electrical/electronic manufacturing	Cyanides; metal sludges; caustic (chromic acid); solvents; oils; alkalis; acids; paints and paint sludges; calcium fluoride sludges; methylene chloride; perchloroethylene; trichloroethane; acetone; methanol; toluene; PCBs
Fleet/trucking/bus terminals	Waste oil; solvents; gasoline and diesel fuel from vehicles and storage tanks; fuel oil; other automotive wastes[4]
Food processing	Nitrates; salts; phosphorus; miscellaneous food wastes; chlorine; ammonia; ethylene glycol
Furniture repair/manufacturing	Paints; solvents; degreasing and solvent recovery sludges; lacquers; sealants
Hardware/lumber/parts stores	Hazardous chemical products in inventories; heating oil and fork lift fuel from storage tanks; wood-staining and treating products such as creosote; paints; thinners; lacquers; varnishes
Home manufacturing	Solvents; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy wastes; miscellaneous chemical wastes
Junk/scrap/salvage yards	Automotive wastes [4]; PCB contaminated wastes; any wastes from businesses[6] and households[7]; oils; lead
Machine shops	Solvents; metals; miscellaneous organics; sludges; oily metal shavings; lubricant and cutting oils; degreasers (tetrachloroethylene); metal marking fluids; mold-release agents
Medical/vet offices	X-ray developers and fixers[8]; infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; dental acids; miscellaneous chemicals
Metal plating/finishing/ fabricating	Sodium and hydrogen cyanide; metallic salts; hydrochloric acid; sulfuric acid; chromic acid; boric acid; paint wastes; heavy metals; plating wastes; oils; solvents
Mines/gravel pits	Mine spills or tailings that often contain metals; acids; highly corrosive mineralized waters; metal sulfides; metals; acids; minerals sulfides; other hazardous and nonhazardous chemicals[9]
Office buildings/complexes	Building wastes[6]; lawn and garden maintenance chemicals[5]; gasoline; motor oil
Parking lots/malls	Hydrocarbons; heavy metals; building wastes[6]
Photo processing/printing	Biosludges; silver sludges; cyanides; miscellaneous sludges; solvents; inks; dyes; oils; photographic chemicals
Plastics/synthetics producers	Solvents; oils; miscellaneous organic and inorganics (phenols, resins); paint wastes; cyanides; acids; alkalis; wastewater treatment sludges; cellulose esters; surfacant; glycols; phenols; formaldehyde; peroxides; etc.
Research laboratories	X-ray developers and fixers[8]; infectious wastes; radiological wastes;

	biological wastes, disinfectants; asbestos; beryllium; solvents; infectious materials; drugs; disinfectants; (quaternary ammonia, hexachlorophene, peroxides, chlornexade, bleach); miscellaneous chemicals
RV/mini storage	Automobile wastes[4]; gasoline and diesel fuel from vehicles and storage tanks
Wood preserving/treating	Wood preservatives; creosote, pentachlorophenol, arsenic
Wood/pulp/paper processing and mills	Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals[9]; organic sludges; sodium hydroxide; chlorine; hypochlorite; chlorine dioxide; hydrogen peroxide; treated wood residue (copper quinolate, mercury, sodium bazide); tanner gas; paint sludges; solvents; creosote; coating and gluing wastes
Agricultural/Forest	
Auction lots	Livestock sewage wastes; nitrates; phosphates; coliform and noncoliform bacteria; giardia, viruses; total dissolved solids
Chicken/turkeys	Nitrates; phosphates; potassium; total dissolved solids; salts
Confined animal feeding operations	Livestock sewage wastes; nitrates; phosphates; chloride; chemical sprays and dips for controlling insect, bacterial, viral and fungal pests on livestocks; coliform[10] and noncoliform bacteria; viruses; giardia; total dissolved solids
Dairies	Nitrates; total dissolved solids; salts; phosphates; potassium
Farm chemical distributor/application service	Pesticides[11]; fertilizers[12]; hydrocarbons from motor vehicles and storage tanks
Farm machinery repair	Automotive wastes[4]; welding wastes
Irrigated crops	Pesticides[11]; fertilizers [12]; nitrates; phosphates; potassium (can be worsened by over-watering)
Lagoons	Nitrates; Livestock sewage wastes; salts; pesticides[11]; fertilizers[17]; bacteria
Managed forest lands	Sediments; pesticides[11]; fertilizers[12]; petroleum (spills)
Nonirrigated crops	Pesticides[11]; fertilizers[12]; nitrates; phosphates; potassium
Pesticide/fertilizer/petroleum storage & transfer areas	Pesticides[11]; fertilizers[12]; petroleum residues
Rural homesteads	*Machine shops:* Automotive wastes[4]; welding wastes; solvents; metals; lubricants; sludges *Septic systems:* Septage; coliform[10] and noncoliform bacteria; viruses; nitrates; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides;[5,13] paints; paint thinner; photographic chemicals; swimming pool chemicals;[14] septic tank/cesspool cleaner chemicals;[15] elevated levels of chloride, sulfate, calcium, magnesium, potassium, and phosphate
Swine	Nitrates; phosphates; potassium
Residential / Municipal	
Airports (maintenance/fueling areas)	Jet fuels; deicers; diesel fuel; chlorinated solvents; automotive wastes;[4] heating oil; building wastes[6]
Apartments and condominiums	Swimming pool maintenance chemicals[14] ; pesticides for lawn and garden maintenance and cockroach, termite, ant, rodent, and other pest control[5,13], wastes from on-site sewage treatment plants; household hazardous wastes[7]
Camp grounds/RV parks	Septage; gasoline; diesel fuel from boats; pesticides for controlling mosquitoes, ants, ticks, gypsy moths, and other pests[11,13]; household hazardous wastes from recreational vehicles (RVs)[7]
Drinking water treatment plants	Treatment chemicals; pesticides[11]
Fire stations	General building wastes[6] ; hydrocarbons from test burn areas
Golf courses	Fertilizers[12]; herbicides[11]; pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests[5]

Housing	*Household hazardous wastes*[1] Household cleaners; oven cleaners; drain cleaners; toilet cleaners; disinfectants; metal polishes; jewelry cleaners; shoe polishes; synthetic detergents; bleach; laundry soil and stain removers; spot removers and dry cleaning fluid; solvents; lye or caustic soda; household pesticides;[13] photo chemical; printing ink, paints; varnishes; stains; dyes; wood preservatives (creosote); paint and lacquer thinners; paint and varnish removers and deglossers; paint brush cleaners; floor and furniture strippers *Mechanical Repair and Other Maintenance Products:* Automotive wastes;[4] waste oils; diesel fuel; kerosene; #2 heating oil; grease; degreasers for driveways and garages; metal degreasers; asphalt and roofing tar; tar removers; lubricants; rustproofers; car wash detergents; car waxes and polishes; rock salt; refrigerants *Lawn/garden care:* Fertilizers;[11] herbicides and other pesticides used for lawn and garden maintenance[5] (can be worsened by over-watering) *Swimming pools:* Swimming pool maintenance chemicals[14] *Urban runoff/stormwater*[3]: Gasoline; oil; other petroleum products; microbiological contaminants
Landfills/dumps	Leachate; organic and inorganic chemical contaminants; waste from households[7] and businesses[6]; nitrates; oils; metals; solvents; sludge
Motor pools	Automotive wastes[4]: solvents; waste oils; hydrocarbons from storage tanks
Parks	Fertilizers[12]; herbicides[5]; insecticides[11,13]; (can be worsened by over-watering)
Railroad yards/maintenance/fueling areas	Diesel fuel; herbicides for rights-of-way [11]; creosote fro preserving wood ties; solvents; paints; waste oils
Schools	Machinery/vehicle serving wastes; gasoline and heating oil from storage tanks; general building wastes[6]; pesticides[11,13]:
Septic systems	Nitrates; septage; Cryptosporidium; Giardia; coliform[10] and noncoliform bacteria; viruses; drain cleaners; solvents; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides;[5,13] paints; paint thinner; photographic chemicals; swimming pool chemicals;[14] septic tank/cesspool cleaner chemicals[15] ; elevated levels of chloride, sulfate, calcium, magnesium, potassium, and phosphate; other household hazardous wastes[7]
Utility stations/maintenance areas	PCBs from transformers and capacitors; oils; solvents; sludges; acid solution; metal plating solutions (chromium, nickel, cadmium); herbicides from utility rights-of-way
Waste transfer/recycling stations	Residential and commercial solid waste residues
Wastewater	Municipal wastewater; sludge[16]; treatment chemicals[17]; nitrates; heavy metals; coliform[10] and noncoliform bacteria; nonhazardous wastes[16]
Miscellaneous	
Above ground storage tanks	Heating oil; diesel fuel; gasoline; other chemicals
Construction/demolition areas (plumbing, heating, and air conditioning, painting, paper hanging, decorating, drywall and plastering, acoustical insulation, carpentry, flooring, roofing, and sheet metal etc.)	Solvents; asbestos; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy waste; miscellaneous chemical wastes
Historic gas stations	Diesel fuel; gasoline; kerosene
Historic waste dumps/landfills	Leachate; organic and inorganic chemicals; waste from households [7]; and businesses [6]; nitrates; oils; heavy metals; solvents
Injection wells/drywells/sumps	Stormwater runoff [3]; spilled liquids; used oils; antifreeze; gasoline; solvents; other petroleum products; pesticides[11]; and a wide variety

	of other substances
Military installations	Wide variety of hazardous and nonhazardous wastes depending on the nature of the facility and operation[3,9]; diesel fuels; jet fuels; solvents; paints; waste oils; heavy metals; radioactive wastes
Surface water - stream/lakes/rivers	(Directly related to surface water quality in the stream, lake, or river which is recharging groundwater)
Transportation corridors	Herbicides in highway right-of-way[11,5]; road salt (sodium and calcium chloride); road salt, anticaking additives (ferric ferrocyanide, sodium ferrocyanide); road salt anticorrosives (phosphate and chromate); automotive wastes[4]
Underground storage tanks	Diesel fuel; gasoline; heating oil; other chemical and petroleum products
Wells (such as water supply wells, monitoring wells, unsealed or abandoned wells, and test holes)	Storm water runoff [3]; solvents; nitrates; septic tanks; hydrocarbons; and a wide variety of other substances

SOURCE: Adapted from EPA ; Supplemented with information from Oregon DEQ hazardous waste / water quality databases and Drinking Water Protection citizen's and technical advisory committees

NOTES

[1]In general, water contamination stems from the misuse and improper disposal of liquid and solid wastes; the illegal dumping or abandonment of household, commercial, or industrial chemicals; the accidental spilling of chemicals from trucks, railways, aircraft, handling facilities, and storage tanks; or the improper siting, design, construction, operation, or maintenance of agricultural, residential, municipal, commercial, and industrial drinking water wells and liquid and solid waste disposal facilities. Contaminants also can stem from atmospheric pollutants, such as airborne sulfur and nitrogen compounds, which are created by smoke, flue dust, aerosols, and automobile emissions, fall as acid rain, and percolate through the soil. When the contaminants list in this table are used and managed properly, environmental contamination is not likely to occur.

[2]Contaminants can reach water bodies from activities occurring on the land surface, such as industrial waste storage; from sources below the land surface but above the water table, such as septic systems; from structures beneath the water table, such as wells; or from contaminated recharge water.

[3]This table lists the most common wastes, but not all potential wastes. For example, it is not possible to list all potential contaminants contained in stormwater runoff or from military installations.

[4]Automobile wastes can include gasoline; antifreeze; automatic transmission fluid; battery acid; engine and radiator flushes; engine and metal degreasers; hydraulic (brake) fluid; and motor oils.

[5]Common pesticides used for lawn and garden maintenance (i.e., weed killers, and mite, grub, and aphid controls) include such chemicals as 2,4-D; chlorpyrifos; diazinon; benomyl; captan; dicofol; and methoxychlor.

[6]Common wastes from public and commercial buildings include automotive wastes; and residues from cleaning products that may contain chemicals such a xylenols, glycol esters, isopropanol, 1,1,1,-trichloroethane, sulfonates, chlorinated phenols, and cresols.

[7] Household hazardous wastes are common household products which contain a wide variety of toxic or hazardous components (contact Oregon DEQ Household Waste Program for list).

[8]X-ray developers and fixers may contain reclaimable silver, glutaldehyde, hydroquinone, potassium bromide, sodium sulfite, sodium carbonate, thiosulfates, and potassium alum.

[9]The Resource Conservation and Recovery Act (RCRA) defines a hazardous waste as a solid waste that may cause an increase in mortality or serious illness or pose a substantial threat to human health and the environment when improperly treated, stored, transported, disposed of, or otherwise managed. A waste is hazardous if it exhibits characteristics of ignitability, corrosivity, reactivity, and/or toxicity. Not covered by RCRA regulations are domestic sewage; irrigation waters or industrial discharges allowed by the Clean Water Act; certain nuclear and mining wastes; household wastes; agricultural wastes (excluding some pesticides); and small quantity hazardous wastes (i.e., less than 220 pounds per month) generated by businesses.

[10]Coliform bacteria can indicate the presence of pathogenic (disease-causing) microorganisms that may be transmitted in human feces. Diseases such as typhoid fever, hepatitis, diarrhea, and dysentery can result from sewage contamination of drinking water supplies.

[11]Pesticides include herbicides, insecticides, rodenticides, fungicides and avicides. EPA has registered approximately 50,000 different pesticide products for use in the United States. Many are highly toxic and quite mobile in the subsurface. An EPA survey found that the most common pesticides found in drinking water wells were DCPA (dacthal) and atrazine, which EPA classifies as moderately toxic (class 3) and slightly toxic (class 4) materials, respectively

[12]The EPA National Pesticides Survey found that the use of fertilizers correlates to nitrate contamination of groundwater supplies.

[13]Common household pesticides for controlling pests such as ants, termites, bees, wasps, flies, cockroaches, silverfish, mites, ticks, fleas, worm, rates, and mice can contain active ingredients include naphthalene, phosphorus, xylene, chloroform, heavy metals, chlorinated hydrocarbons, arsenic, strychnine, kerosene, nitrosamines, and dioxin.

[14]Swimming pool chemicals can contain free and combined chlorine; bromine; iodine; mercury-based, copper-based, and quaternary algaecides; cyanuric acid; calcium or sodium hypochlorite; muriatic acid; sodium carbonate.

[15]Septic tank/cesspool cleaners include synthetic organic chemicals such as 1,1,1 trichloroethane, tetrachloroethylene, carbon tetrachlorine, and methylene chloride.

[16]Municipal wastewater treatment sludge can contain organic matter, nitrates; inorganic salts, heavy metals; coliform and noncoliform bacteria; and viruses.

[17]Municipal wastewater treatment chemicals include calcium oxide; alum; activated alum, carbon, and silica; polymers; ion exchange resins; sodium hydroxide; chlorine; ozone; and corrosion inhibitors.

Potential Sources of Contamination Help Guide

Source Name	Source Category	Associated Chemicals	Health, Environment or Aesthetic Contaminant
Pesticide/fertilizer/petroleum storage and transfer areas	Agriculture	pH, NN, SOC, VOC	Hydrocarbons; oil-field brines (highly mineralized salt solutions)
Confined Animal Feeding Operations	Agriculture	NN, MP, TO	Livestock sewage wastes; nitrates; pHospHates; chloride; chemical sprays and dips for controlling insect, bacterial, viral, and fungal pests on livestock; coliform and noncoliform bacteria; viruses
Animal Feedlots	Agriculture	NN, MP, TO	Livestock sewage wastes; nitrates; phosphates; chloride; chemical sprays and dips for controlling insect, bacterial, viral, and fungal pests on livestock; coliform and noncoliform bacteria; viruses
Farm chemical distributor	Agriculture	NN, VOC, SOC, pH	Pesticides; fertilizer; gasoline and motor oils from chemical applicators
Fertilizer Application	Agriculture	NN	
Manure spreading or Storage	Agriculture	NN, MP, T, TO	Livestock sewage wastes; nitrates
Drainage tile (agricultural)	Agriculture	NN	Pesticides; fertilizer; bacteria
Crops, corn, soybean, wheat	Agriculture	NN, SOC, MP	Pesticides; fertilizer; gasoline and motor oils from chemical applicators
Crops: other	Agriculture	NN, MP, SOC	Pesticides; fertilizer; gasoline and motor oils from chemical applicators
Animal Burial Grounds	Agriculture	MP, TO	Livestock sewage wastes; nitrates; phosphates; chloride; chemical sprays and dips for controlling insect, bacterial, viral, and fungal pests on livestock; coliform and noncoliform bacteria; viruses
Fertilizer Storage	Agriculture	NN	
Slaughterhouses	Agriculture	MP, TO, T, SOC, D	
Crops: orchards	Agriculture	NN, SOC	Pesticides; fertilizer; gasoline and motor oils from chemical applicators
Crop Irrigation	Agriculture	NN, MP, T	Pesticides; fertilizer; gasoline and motor oils from chemical applicators
Dairy Farms	Agriculture		
Other animal facilities	Agriculture	MP	
Drainage canals (agricultural)	Agriculture	T	Pesticides; fertilizer; bacteria
Greenhouses/Nurseries	Agriculture	MP, NN	
Silviculture (logging)	Agriculture	T, pH, VOC	
Pasture	Agriculture	MP, SOC	
Other (specify source)	Agriculture		
Railroad Tracks and Yards	Commercial	pH, M, VOC, SOC	Diesel fuel; herbicides for rights-of-way; creosote for preserving wood ties
Leaking Underground Storage Tank	Commercial	pH, VOC	
Other (Highway and Road Bulk Transportation)	Commercial		
Dry cleaners	Commercial	VOC, SOC	Solvents (perchloroethylene, petroleum solvents, Freon); spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Underground Storage Tanks	Commercial	pH, VOC	Heating oil; diesel fuel; gasoline; other petroleum products; other commercially used chemicals
Above Ground Storage Tanks	Commercial	pH, VOC	Heating oil; diesel fuel; gasoline; other petroleum products; other commercially used chemicals
Historic gas stations	Commercial	pH, M, VOC	
Golf courses	Commercial	VOC, SOC, pH	Fertilizers; herbicides; pesticides for controlling mosquitoes, ticks, ants, gypsy moths and other pests
Junk yards, scrap and auto	Commercial	pH, VOC, SOC, M, HM	
Sawmills and planers	Commercial	pH, VOC, SOC	Treated wood residue (copper quinolate, mercury, sodium bazide); tanner gas; paint sludges; solvents; creosote; coating and gluing wastes
Airports/Abandoned airfields	Commercial	pH, VOC	Jet fuels; deicers; diesel fuel; chlorinated solvents; automotive wastes; heating oil; building wastes
Fleet/truck/bus terminals	Commercial	M, VOC, HM, SOC, pH	Fuel tanks; repair shop wastes; other hazardous and nonhazardous wastes
Pest control company	Commercial	VOC, SOC	Pesticides
Heating oil companies	Commercial	pH, VOC	Heating oil; wastes from truck maintenance areas
Utility Substation Transformers	Commercial	pH, VOC, SOC	PCBs from transformers and capacitors; oils; solvents; wood preservatives (creosote and pentachloropHenol); sludges; acid solution; metal plating solutions (chromium, nickel, cadmium); herbicides from utility rights-of-way
Auto repair shops	Commercial	pH, M, VOC, HM, SOC	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils
Gas Stations	Commercial	pH, M, VOC, SOC	Oils; solvents; miscellaneous wastes

Research laboratories	Commercial	M, VOC, SOC	X-ray developers and fixers; infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; solvents; infectious materials; drugs; disinfectants (quaternary ammonia, hexachloropHene, peroxides, chlornexade, bleach); miscellaneous chemicals
Construction areas	Commercial	M, T, pH, VOC, SOC, HM	Solvents; asbestos; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy waste; miscellaneous chemical wastes
Repair Shops (engine, appliances, etc.)	Commercial	pH, VOC, SOC	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils
Tire Dumps	Commercial	M	
Demolition areas	Commercial	M, T, pH, VOC	Solvents; asbestos; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy waste; miscellaneous chemical wastes
Hospitals	Commercial	R, VOC, MP, D	X-ray developers and fixers; infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; dental acids; miscellaneous chemicals
Landscaping firms	Commercial	VOC, pH, SOC, NN	Fertilizers; herbicides and other pesticides used for lawn and garden maintenance
Body shops	Commercial	VOC, pH	Waste oils; solvents; acids; paints; automotive wastes; miscellaneous cutting oils
Equipment rental/repair shop	Commercial	pH, M, VOC	
Cemeteries	Commercial	M, SOC, pH	Leachate; arsenic; lawn and garden maintenance chemicals
Hardware/lumber/parts stores	Commercial	VOC, SOC, HM, M	Hazardous chemical products in inventories; heating oil and fork lift fuel from storage tanks; wood-staining and treating products such as creosote, chloropHenolic compounds, chromium, copper, and arsenic
Funeral services and crematories	Commercial	M, MP, SOC, HM, VOC	Formaldehyde; wetting agents; fumigants; solvents
Lawn/farms stores	Commercial	VOC, SOC, NN	Fertilizers; herbicides and other pesticides used for lawn and garden maintenance
Campgrounds	Commercial	MP, SOC, VOC, pH	Septate; gasoline; diesel fuel from boats; pesticides for controlling mosquitoes, ants, ticks, gypsy moths and other pests; household hazardous wastes from recreational vehicles (RVs)
Paint stores	Commercial	M, VOC, SOC	Paints; paint thinners; lacquers; varnishes; other wood treatments
Waste Incinerators	Commercial	H, HM, VOC, SOC	
pHoto processing/printing	Commercial	M, VOC, SOC	Biosludges; silver sludge's; cyanides; miscellaneous sludges
Print shops	Commercial	VOC, SOC	Solvents; inks; dyes; oils; pHotograpHic chemicals
Furniture and fixtures manufacturers	Commercial	VOC, SOC	Paints; solvents; varnishes; degreasing sludges; solvent recovery sludges
Printer/publisher	Commercial	VOC, SOC	Solvents; inks; dyes; oils; miscellaneous organics; pHotograpHic chemicals
Boat services/repair/refinishing	Commercial	pH, VOC, NN, M, HM	Diesel fuels; oil; septate from boat waste disposal areas; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes
Car washes	Commercial	pH, VOC	Soaps; detergents; waxes; miscellaneous chemicals
Furniture repair and finishing shops	Commercial	VOC, SOC	Paints; solvents; degreasing and solvent recovery sludges
Rust Proofers	Commercial	M, VOC, SOC	
Veterinary offices	Commercial	MP, R	Solvents; infectious materials; vaccines; drugs; disinfectants (quaternary ammonia, hexachloropHene, peroxides, chlornexade, bleach); x-ray developers and fixers
Car dealerships	Commercial	pH, VOC	Automotive wastes; waste oils; solvents; miscellaneous wastes
Parking lots/malls	Commercial	VOC, pH	
Landscaping (Commercial)	Commercial		
Welding Shops	Commercial	M, VOC	Oxygen, acetylene
Nursing Homes	Commercial	MP, D	
Office building/complexes	Commercial	pH, VOC, SOC	Building wastes; lawn and garden maintenance chemicals; gasoline; motor oil
Marina/boat docks	Commercial	pH	Diesel fuels; oil; septate from boat waste disposal areas; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes
Medical/dental offices/clinics	Commercial	MP, D, R	X-ray developers and fixers; infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; dental acids; miscellaneous chemicals
Laundromats	Commercial	VOC, SOC	Detergents; bleaches; fabric dyes
Aquiculture/fishing lakes	Commercial	NN, MP, TO	
Schools (includes colleges)	Commercial		
Recreational vehicle/mini storage	Commercial	pH, VOC	
Pharmacies	Commercial	VOC, SOC	Spilled and returned products
Prisons	Commercial		
Other (specify source)	Commercial		
CERCLIS	Database	HM, M, VOC, SOC, R	
Coal Dams	Database	HM, M, T, pH	
Historic Spills (USCG, WVDHSEM)	Database		

Solid Waste Facilities	Database	HM, M, VOC, SOC, NN	
Chemical Spills	Industrial	pH, M, VOC, SOC	
Clandestine Dumping	Industrial	M, VOC, SOC, TO, HM	
Chemical Manufacture	Industrial	pH, R, M, VOC, SOC	
Landfills: hazardous wastes	Industrial	pH, M, VOC, SOC	Leachate; hazardous and nonhazardous wastes; nitrates
Chemical Landfills	Industrial	pH, M, VOC, SOC	Leachate; hazardous and nonhazardous wastes; nitrates
Industrial pipelines	Industrial	pH, M, VOC	Corrosive fluids; hydrocarbons; other hazardous and nonhazardous materials and wastes
Hazardous waste storage, treatment, recycling	Industrial	pH, R, M, VOC, SOC	
Chemical/petroleum pipelines	Industrial	pH, M, VOC, SOC	
Chemical Drums/Storage	Industrial	pH, M, VOC, SOC	Pesticides; fertilizer residues
Lagoon/Pond/Pit	Industrial	VOC, pH, SOC	Sewage wastewater; nitrates or other liquid wastes; microbiological contaminants; Hazardous and nonhazardous liquid wastes; septate; sludge
Plastics/synthetics producers	Industrial	VOC, SOC, M	Solvents; oils; miscellaneous organics and inorganics (pHenols, resins); paint wastes; cyanides; acids; alkalis; wastewater treatment sludges; cellulose esters; surfactant; glycols; pHenols; formaldehyde; peroxides; etc.
Tanneries	Industrial	VOC, TO, M	
Foundries and metal fabricators	Industrial	M, HM, VOC, SOC, pH	Paint wastes; acids; heavy metals; metal sludges; plating wastes; oils; solvents; explosive wastes
Wells: oil and gas	Industrial	pH, M, VOC	Brines associated with oil and gas operations; drilling fluids/muds, diesel/gasoline fuels and other petroleum products
Landfills: Unregulated dumps	Industrial	pH, M, VOC, SOC, TO	
Fuel Oil Distributors	Industrial	pH, VOC	
Petroleum production and storage facilities	Industrial	pH, M, VOC	Hydrocarbons; oil-field brines (highly mineralized salt solutions)
Mining: Surface	Industrial	M, T	Mine spoils or tailings that often contain metals; acids; highly corrosive mineralized waters; metal sulfides
Paper Mills	Industrial	M, VOC, HM, SOC, TO	Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals
Wells: Injection	Industrial	M, VOC, pH, SOC	Highly toxic wastes; hazardous and nonhazardous industrial wastes; oilfield brines
Wells: brine injection	Industrial	M, VOC, pH	Highly toxic wastes; hazardous and nonhazardous industrial wastes; oilfield brines
Landfills: Industrial non hazardous	Industrial	M, VOC, TO	Leachate; organic and inorganic chemical contaminants; wastes from households and businesses; nitrates; oils; metals
Material stockpiles (coal, metallic ores, pHospHates, gypsum)	Industrial	M, HM, T	Acid drainage; other hazardous and nonhazardous wastes
Surface Impoundments	Industrial	VOC, TO, M, pH	
Metal finishing/plating	Industrial	M, VOC, SOC	
Wood preserving/treatment facilities	Industrial	M, VOC, SOC	Wood preservatives; creosote; chloropHenolic compounds; metals
Sawmills	Industrial	pH, VOC	Treated wood residue (copper quinolate, mercury, sodium bazide); tanner gas; paint sludges; solvents; creosote; coating and gluing wastes
AspHalt plants	Industrial	pH, VOC	Petroleum derivatives
Pharmaceutical Manufacturers	Industrial		
Public Utilities (pHone, gas, electric power)	Industrial	M, VOC, SOC	PCBs from transformers and capacitors; oils; solvents; wood preservatives (creosote and pentachloropHenol); sludges; acid solution; metal plating solutions (chromium, nickel, cadmium); herbicides from utility rights-of- way
Electroplaters	Industrial	M, VOC, HM, SOC	Boric, hydrochloric, hydrofluoric, and sulfuric acids; sodium and potassium hydroxide; chromic acid; sodium and hydrogen cyanide; metallic salts
Permitted Discharge Pipe (outfall)	Industrial	ALL	
Machine and metalworking shops	Industrial	M, VOC, HM, pH, SOC	Solvents; metals; miscellaneous organics; sludges; oily metal shavings; lubricant and cutting oils; degreasers (tetrachloroethylene); metal marking fluids; mold-release agents
Stone, clay and glass manufacturers	Industrial	M	Solvents; oils and grease; alkalis; acetic wastes; asbestos; heavy metal sludges; pHenolic solids or sludges; metal-finishing sludge
Industrial Parks	Industrial		
Metal and Drum cleaning/reconditioning	Industrial	M, VOC, SOC	
Textile Manufacturers	Industrial		
Cement/concrete plants	Industrial	pH, VOC, HM, SOC	
Quarry	Industrial	M, T, pH, VOC	

Electrical / electronic manufacturing	Industrial	M, VOC, HM, SOC	Cyanides; metal sludges; caustics (chromic acid); solvents; oils; alkalis; acids; paints and paint sludges; calcium fluoride sludges; methylene chloride; perchloroethylene; trichloroethane; acetone; methanol; toluene; PCBs
Food Processors	Industrial		
Communication Equipment Manufacturers	Industrial	M, VOC, HM, SOC	Nitric, hydrochloric, and sulfuric acid wastes; heavy metal sludges; copper-contaminated etchant (e.g., ammonium persulfate); cutting oil and degreasing solvent (trichloroethane, Freon, or trichloroethylene); waste oils; corrosive soldering flux; paint sludge; waste plating solution
Gravel pits	Industrial	pH	
Illegal Dump	Municipal	pH, M, VOC, SOC	
Historic waste dumps/landfills	Municipal	M, VOC, SOC, NN	
Sewer Lines	Municipal	M, VOC, MP, TO	Municipal wastewater, sludge; treatment chemicals
Landfills/municipal	Municipal	M, VOC, HM, SOC, NN	Leachate; organic and inorganic chemical contaminants; wastes from households and businesses; nitrates; oils; metals
Storm water basins/drains (injection well)	Municipal	M, VOC, MP	
Wells: abandoned	Municipal	VOC, SOC, MP, pH, NN	Surface runoff; effluents from barnyards, feedlots, organic chemicals and metals, septic tanks, or cesspools; gasoline; used motor oil; road salt
Radioactive waste disposal sites	Municipal	R, M, HM, VOC, SOC	Radioactive wastes from medical facilities, power plants, and defense operations; radionuclides (uranium, plutonium)
Combined Sewer Overflows	Municipal	MP, TO, VOC, pH	Municipal wastewater; sludge; treatment chemicals; urban runoff; gasoline; oil; other petroleum products; road salt; microbial contaminants
Highway	Municipal	pH, VOC, M	Herbicides in highway rights-of-way; road salt (sodium and calcium chloride); road salt anti-caking additives (ferris ferrocyanide, sodium ferrocyanide); aspHalt/tar; road salt anti-corrosives (pHospHate and chromate); automotive wastes
Railroad Tracks (right of way)	Municipal	M, VOC, SOC, pH	Diesel fuel; herbicides for rights-of-way; creosote for preserving wood ties
Railroad yards/maintenance/fueling areas	Municipal	pH, VOC, SOC, HM, M	Diesel fuel; herbicides for rights-of-way; creosote for preserving wood ties
Military Base (past and present)	Municipal	pH, R, M, VOC, SOC	
Artificial ground water recharge areas	Municipal	MP	Storm water runoff; excess irrigation water; stream flow; cooling water; treated sewage effluent; other substances that may contain contaminants, such as nitrates, metals, detergents, synthetic organic compounds, bacteria, and viruses
Sewage sludge/Biological Solids application	Municipal	M, VOC, MP, TO	
Wastewater application	Municipal	MP, D	
Maintenance areas (general)	Municipal	VOC, M, SOC, pH	Waste oils
Vault toilets	Municipal	MP, NN, D	
Wastewater Treatment Plant	Municipal	MP, D	
Recycling/reduction facilities	Municipal	M, VOC, HM, SOC	Residential and commercial solid waste residues
Sewage Treatment Impoundments	Municipal	MP, NN, D	
Storm Drains	Municipal	M, VOC, MP, pH	Urban runoff; gasoline; oil; other petroleum products; road salt; microbiological contaminants
Storm water basins/drains	Municipal	M, VOC, MP	Urban runoff; gasoline; oil; other petroleum products; road salt; microbiological contaminants
Right-of-ways (herbicide use areas)	Municipal	VOC, SOC	
Waste transfer/recycling stations	Municipal	pH, M	Residential and commercial solid waste residues
Composting facility/yard wastes	Municipal	MP, TO, SOC	
Incinerators (municipal)	Municipal	M, HM	
Road maintenance depots/deicing operations	Municipal	pH, VOC, M	Herbicides in highway rights-of-way; road salt (sodium and calcium chloride); road salt anti-caking additives (ferris ferrocyanide, sodium ferrocyanide); aspHalt/tar; road salt anti-corrosives (pHospHate and chromate); automotive wastes
Historic railroad right-of-ways	Municipal	M, pH	
Park lands	Municipal	NN, SOC	Fertilizers; herbicides, insecticides
Schools	Municipal	SOC, D, VOC, pH	Solvents; pesticides; acids; alkalis; waste oils; machinery/vehicle servicing wastes; gasoline and heating oil from storage tanks; general building wastes
Fire Stations	Municipal	pH, VOC	
Managed forest	Municipal	SOC	
Swimming Pools	Municipal	Chlorine, D	Swimming pool chemicals
Septic Systems (discharging to subsurface)	Residential	M, VOC, SOC, TO, NN	Coliform and noncoliform bacteria; viruses; nitrates; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides; paints; paint thinner; pHotograpHic chemicals; swimming pool chemicals; septic tank/cesspool cleaner chemicals; elevated levels of chloride, sulfate, calcium, magnesium, potassium, and pHospHate

Septic Systems (leach field)	Residential	MP, VOC, SOC, TO, NN	Coliform and noncoliform bacteria; viruses; nitrates; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides; paints; paint thinner; pHotograpHic chemicals; swimming pool chemicals; septic tank/cesspool cleaner chemicals; elevated levels of chloride, sulfate, calcium, magnesium, potassium, and pHospHate
Pesticide Application	Residential	VOC, SOC	Pesticide
Residential (single family homes)	Residential	VOC, SOC, NN	Common Household Products: Household cleaners; oven cleaners; drain cleaners; toilet cleaners; disinfectants; metal polishes; jewelry cleaners; shoe polishes; synthetic detergents; bleach; laundry soil and stain removers; spot removers and dry cleaning fluid; solvents; lye or caustic soda; household pesticides; pHotochemicals; printing ink, other common products. Wall and Furniture Treatments: Paints; varnishes; stains; dyes; wood preservatives (creosote); paint and lacquer thinners; paint and varnish removers and deglossers; paintbrush cleaners; floor and furniture strippers. Mechanical Repair and Other Maintenance Products: Automotive wastes; waste oils; diesel fuel; kerosene; #2 heating oil; grease; degreasers for driveways and garages; metal degreasers; aspHalt and roofing tar; tar removers; lubricants; rustproofers; car wash detergents; car waxes and polishes; rock salt; refrigerants
Residential (multi-units)	Residential	VOC, NN, TO, MP	Swimming pool maintenance chemicals; pesticides for lawn and garden maintenance and cockroach, termite, ant, rodent, and other pest control

Key to Associated Chemicals:
MP- Microbiological Pathogens: Total/Fecal Coliform, Viruses, Protozoa NN - Nitrate/Nitrite
VOC- Volatile Organic Compounds
HM - Heavy Metals
M - Metals
SOC- Synthetic Organic Compounds
T - Turbidity
TO - Taste and Odor precursors
PH - Petroleum Hydrocarbons R
- Radionuclides
D - Disinfection byproducts
ND - Not Determined

***The information in this help guide originated from the **Supplemental Guide III-Potential Sources of Significant Contamination** provided by the West Virginia Bureau for Public Health, Source Water Assessment and Protection Program, in collaboration with key stakeholders and partners, July 2015.

Appendix B. Partial List of Potential Sources of Contamination (PSOC) in Vermont. Extracted from the 1997 publication, Protecting Public Water Sources in Vermont

https://dec.vermont.gov/water/drinking-water/public-drinking-water-systems/source-water-protection

A Partial List of Potential Sources of Contamination in Vermont.

The following list is not inclusive, but is provided as a guide for Public Water Systems in developing Source Protection Plans. It is not intended to be adopted as a list of prohibitions in a wellhead protection area, but if a listed land use exists or is proposed in a PWS, the activity should be reviewed for any potential impact. By using best management practices and conservative design standards, the risk of contamination can be reduced. There is some overlap among the categories. Some activities are regulated by the State (Appendix C); others are not.

I. Commercial Activities

1) Laundromats
2) Drycleaners
3) Carpet and Upholstery Cleaners
4) Printing and Publishing
5) Photography and X-ray Labs
6) Furniture Stripping/Painting
7) Beauty Salons
8) Funeral Homes
9) Pest Control
10) Boat Building & Repairing
11) Automotive Service Industry
    a) gasoline stations
    b) car wash
    c) service station
    d) service (full repair)
    e) service (minor repair)
    f) body work
    g) junk yards
    h) auto/truck sales
12) Cemeteries
13) Taxidermists
14) Oil Distributors
15) Wood Preserving
16) Machine Shops/Metal Working

II. Manufacturing

1) Soft drink bottlers
2) Textiles (dying & finishing of fiber, yarn, or fabric)

3) Paper and allied products
   a) pulp mills
   b) paper coating & glazing
4) Tanneries
5) Paving and Roofing (asphalt plants)
6) Rubber and Miscellaneous Plastic Products
7) Stone, Glass, Clay & Concrete Products
8) Canneries
9) Meat Packing, Rendering & Poultry Plants
10) Electrical Component Industry
11) Industrial Lagoon and Pits
12) Chemicals and Allied Products
   a) fertilizers
   b) pesticides and agricultural chemicals
   c) industrial organic chemicals
   d) synthetic organic fibers, except cellulosic
   e) biological products
   f) medicinal chemicals & botanical products
   g) pharmaceutical preparations
   h) soap and other detergents
   i) specialty cleaning, polishing and sanitation preparations
   j) perfumes, cosmetics, and other toilet preparations
   k) paints, varnishes, lacquers, enamels and allied products
   l) gum and wood chemicals
   m) adhesives and sealants
   n) warehouses retail/wholesale
13) Furniture Manufacturers

III. Agricultural

1) Animal Feedlots, Barns, Stables, and Kennels
2) Manure Pits
   a) lined pits
   b) unlined pits
3) Fertilizers and Pesticides (usage and storage)
4) Animal Burial
5) Dairy Waste
6) Poultry and Egg Processing
7) Creameries and Dairies

IV. Municipal

1) Dust Inhibitors
2) Landfills
   a) with or without leachate collection system
   b) lined or unlined
   c) solid waste, hazardous waste, demolition
3) Storm Water Drains and Retention Basins
4) Sludge and Septage Land Application or Landfilling
5) Wastewater and Sewer Lines
6) Railroad Tracks and Yards Maintenance Stations
7) Highway de-icing salts
   a) application
   b) storage
8) Airports
   a) maintenance/repair aircrafts
   b) runway maintenance
   c) storage areas
9) Electric Power Generation Plants and Powerline Corridors
10) Rights of Way and Highway Maintenance
11) Solid waste storage facilities and transfer stations

V. Residential

1) Septic Systems, Cesspools & Privies
   a) septic tank cleaners
   b) septage
2) Household Hazardous Waste
   a) cleaning supplies
   b) paint products
   c) automotive products
   d) lawn care (pesticide spraying and storage)

VI. Other Land Uses

1) Mining and Mine Drainage
2) Development (ski resorts, hotels, etc.)
   a) community size septic systems
   b) community size fuel storage tanks
3) Landscape Work
   a) turfgrass care - athletic fields

b) commercial landscape work - grounds keeping
c) tree service
d) forestry

4) Radioactive Wastes
   a) medical
   b) energy related
5) Class V Underground Injection Wells
   a) automobile service station floor drains
   b) industrial process water and waste disposal wells
   c) agricultural drainage wells
   d) storm water and industrial drainage wells
   e) cesspools
   f) aquifer remediation related wells
   g) abandoned drinking wells
   h) groundwater heat pump return wells
6) Underground storage tanks
7) Above Ground Storage Tanks
   a) manure tanks
   b) chemical tanks
   c) fuel tank (farms)
8) Clandestine Dumping
9) Stump Dumps
10) Hazardous Waste Disposal, Storage and Transfer
11) Stockpiles
   a) chemicals
   b) salt
12) Open burning and Detonation Sites
13) Parking Lot Runoff
14) Construction
15) Waste oil storage facilities, above and below ground

Section 3: MANAGEMENT of RISK TOOLS- Resource to develop Table 3

METHOD	ACTIONS/STRATEGIES	Immediate, short term, long term, ongoing	Check
Acquisition/Control	Landownership of isolation zone around water source (minimum of 200 ft)		
	Own or acquire land within the Source Protection Area to increase control of land uses and activities occurring in the SPA; exercise First Right of Refusal.		
	Easements		
	Restrictive Covenants, Homeowner Association policies		
	Deed Restrictions		
	Partner with Land Trusts for conserved lands		
	DWGPD funding opportunities for acquisition		
	Transfer of Development Rights		
Communication *This is a key tool for Promoting protection. The management of contaminants from PSOCs is a process which requires at least some level of cooperation from the person or persons responsible for the activity which is the PSOC.* ***At a minimum, the Water System must notify all landowners within the SPA of the Source Protection Plan.***	Talk with Landowners/business owners		
	Promote voluntary participation		
	Perform field visits, conduct surveys		
	Attend and participate in local town board and committee meetings and hearings (planning, zoning, Selectboard, conservation commission, Recreation, sewer and water, fire dept.)		
	Reach out to Emergency Contacts (Fire, police, emergency management, Health officer)		
	Hold Informational Gatherings		
	Present/Display at Town Meeting Day		
	Annual letters, newsletters, notes in billing statements and or CCR (Consumer Confidence Report)		
Forestry Stewardship	Develop and maintain a Forest Management Plan and Timber Harvest Plan for the Town/Municipal Forest and other forested lands within the SPA		
	Inform individuals about participation in the Current Use Program		
	Promote Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in VT, revised August 2018.		
	Encourage Best Management Practices.		
	Develop relationship with County Forester		
	Promote and participate, as applicable, in forest stewardship incentives and opportunities provided by the US Forestry Service, VT Forest Parks and Recreation Service, and NRCS		

METHOD	ACTIONS/STRATEGIES	Immediate, short term, long term, ongoing	Check
Educational Opportunities	Distribute information handouts and brochures (i.e., "Do your Part. Be Septic Smart" produced by EPA), fact sheets, direct mail. Use digital and social media for messaging, email blasts.		
	Promote VT Dept. of Health drinking water testing for private wells		
	Demonstrate with Ground Water Flow Model (model available from VRWA, Friends of the Winooski, ANR, AOT)		
	Insert Flyers in water bills & CCRs		
	Town Meeting Day displays and handouts		
	School classroom demonstrations		
	Be a guest speaker (LEPC-Local Emergency Planning Commission, schools, Board Meetings, Conservation Groups, Rotary, Fire Dept. etc.)		
	Work with local Conservation Commission, schools, scouting, 4H and other similar organizations to plant Vegetative Buffer Strips along waterways.		
	Sponsor a Household Hazardous Waste Day with the solid waste district.		
	Maintain your water systems Operator Training		
	Post signage of the SPA boundary		
	Promote use of Storage Tank Program of the VT Waste Management and Prevention Division for above ground and underground tanks.		
	Plant buffer strips to intercept storm water runoff from parking lots.		
	sponsor/provide trainings of EM personnel on water system SPA and facility infrastructure, storage of chemicals, etc.		
Agricultural Conservation Practices	Promote use of VT Required Agricultural Practices and Best Management Practices		
	Inform individuals of the NRCS Conservation Programs and priority conservation practices that encourage and promote source water protection: ➢ Groundwater testing ➢ Well Decommissioning ➢ Integrated Pest Management ➢ Nutrient Management ➢ Filter Strips ➢ Riparian Forest Buffer ➢ Field Borders ➢ Cover Crops ➢ Heavy Use Area Protection ➢ Conservation Crop rotation ➢ Agrichemical Handling Facility		
	National Water Quality Initiative, Farm Bill-priority watersheds & conservation practices (EQIP, RCPP)		

METHOD	ACTIONS/STRATEGIES	Immediate, short term, long term, ongoing	Check
Public Water System Infrastructure Improvements	Well camera investigations – detect cracks, leaks, well casing condition		
	Perform scheduled monitoring and sampling for water quality		
	Review and Analyze Existing Data, monitoring samples, etc. to better understand what contaminants are being monitored, where pollution problems may exist, and where to focus pollution control initiatives. Look for increasing trends and potential contaminants.		
	Install barriers such as fencing, bollards, or cement blocks to protect well casing.		
	Provide secondary containment for chemical and fuel/oil storage. Follow proper handling and storage practices.		
	Maintain & Inspect facility components- i.e., properly fitted well caps, screening, locks, secondary containment, pumps, storage tanks		
	New treatment systems and sources		
	Replace broken or leaky water lines		
	Maintain and Update O&M Manual to address any new infrastructure improvements.		
Land Use Regulations and Planning *Evaluate the options for local government to participate in SPA protection. In most cases, local governmental support will greatly facilitate source protection.*	Work with local Planners to ensure source water protection and Public water systems are incorporated into the Town Plan, Regional Plan, municipal Emergency Management Plan, local Hazard Mitigation Plan, Road policies, Watershed Management Plan, Stormwater Management Plan, etc.		
	Adopt & maintain Zoning Regulations and Overlay Districts to provide minimum isolation distances & regulate land use activities within SPAs & APAs.		
	Adopt a Groundwater Protection Ordinance		
	Groundwater Reclassification		
	Work with Selectboards, Public Works Departments, Homeowner Associations, and businesses to institute a road salt reduction policy		
	Participate in local, state, and regional permitting applications and decisions such as Act 250 and Section 248, Subdivisions, Special Use Permits.		
	Participate in master stormwater planning and MRGP (Municipal Roads General Permit).		
	Ensure Hazard Mitigation Plan considers hazards impacting both water quality & quantity. Floods, drought, & ice storms impact drinking water supplies. Consider incidents of vandalism, cybercrimes, and bioterrorism.		

METHOD	ACTIONS/STRATEGIES	Immediate, short term, long term, ongoing	Check
FORM STRONG PARTNERSHIPS *Source water protection involves everyone*	Town/Village Public Works Department, Municipal Departments and Officials		
	Friends of the Winooski River, Friends of the Mad River		
	VT Land Trust		
	VT Natural Resource Conservation Service (NRCS		
	VT Association of Conservation Districts (VACD)		
	County Forester		
	UVM Extension Service		
	VT Rural Water Association		
	Utilities- GMP, WEC,VELCO, Railroads, Solar entities		
	Well Driller Associations		
	Municipal Officials		
	Lake Shore Associations		
	Emergency Responders – Fire, Police, EMDs, LEPC, Haz Mat		
	Rotary and Business Development organizations		
	Solid Waste District		
	Schools and colleges		
	VT Agency of Natural Resources DEC programs		
	VT Dept. of Health		
	VT Dept. of Agriculture		
	VT Agency of Transportation		
	VT Forest, Parks, and Recreation		
	VT Emergency Management		
	Many Others……		

Section 4. SAMPLE LANDOWNER LETTER

Sample 1.

Dear Landowner,

The water supply well for *Wolcott Elementary School* comes from a bedrock water supply well located on the eastern side of the school property and services the school as a Non-Transient-Non-Community (NTNC) water system operating as VT Water System ID # VT0006720. The well and water system are maintained by the school.

As required by the State of Vermont we have developed and routinely update a Source Protection Plan (SPP), for the purpose of protecting the quality and quantity of the drinking water source.

Groundwater in Vermont is generally and excellent source of high-quality drinking water. However, it is vulnerable to contamination from a wide range of everyday activities. Once the groundwater is contaminated, it can be difficult of impossible to purify for drinking. As part of this SPP, we have delineated the surface and subsurface area from which contaminants are considered reasonably likely to reach our well. This land area is referred to as the Source Protection Area (SPA). A map showing the SPA is enclosed for your reference.

We are sending this letter to all property owners withing the SPA. Your property, or a portion of it, is located within the SPA. Therefore, the activities you conduct on your property could potentially affect the quality of our water. For example, gas or fuel leaking from a vehicle, or improperly disposed chemicals entering a leach field could potentially enter the groundwater and thus impact our water supply. We ask that you please be mindful of this when disposing of household wastes, or maintaining a vehicle or equipment etc. Please do not put hazardous wastes down sinks, toilets, or drains. For additional information about maintaining a properly functioning septic system please see the enclosed fact sheet. Hazardous waste disposal is available at *the Coventry Landfill from May 31-Ocotober 1 and Lamoille Regional Solid Waste Management District* also offers opportunities for disposing of household hazardous waste as well. For more information *visit https://lrswmd.org/hazardous-waste/*

Additional steps we hope you will take to help ensure the safety of our water supply are:

• Keep your septic system working properly by pumping regularly.

• Inspect and maintain fuel oil storage tanks and communicate with your fuel delivery company about the increased risk of a spill.

• Refrain from or severely limit the use of herbicides, pesticides, and fertilizers on your gardens and lawns.

These steps will also help protect your own drinking water supply.

If you inadvertently spill any chemicals on your property, please let us know immediately. When a significant spill occurs, we may need to shut off our well to prevent drawing of contaminants into the well supply. In such an event please immediately call *Joe Houston, Facilities Director at (802) 473-0051.* In the event I cannot be reached, call *Wolcott Elementary School at (802) 472-6551 and ask to speak with Dennis Hill or Phil Cardinal.*

Full copies of the Source Protection Plan are available at *Wolcott Elementary, the Wolcott Town Clerk's Office* and the State of Vermont Drinking Water and Groundwater Protection Division in Montpelier. If you have any questions, would like additional information, or to discuss this letter further, please feel free to contact me in my office *at (802) 472-6531 x2934 or my cell phone (802) 473-0051.*

Sincerely,

Joe Houston, Facilities Director

VT Water System Operator #5304

Sample 2.

Dear Landowner,
The *Butterfield Commons* public water system has developed a Source Protection Plan and delineated a Source Protection Area (SPA) for their source well to help protect the quality and quantity of their public drinking water supply. The Plan is updated on a regular basis. The water system is proactively trying to protect its water source by implementing a source protection plan of which this letter of notification is a part.

The Source Protection Plan identifies potential sources of contamination occurring within the SPA that may pose a contamination risk to the water supply source well and suggests strategies and actions that can be used to manage the risk. The purpose of delineating a Source Protection Area is to determine the recharge area that supplies water to a public water source. A Source Protection Area is the surface and subsurface area through which contaminants are likely to move toward and reach a public water supply source. Within a Source Protection Area, land uses and/or naturally occurring materials may cause a public water system to be vulnerable to contamination. While naturally occurring contaminants can usually be controlled by treatment methods, potentially contaminating land uses can be managed by activities outlined in a Source Protection Plan.

Enclosed is a map showing the Source Protection Area. Your land, wholly or partially, is located in the SPA and you may have already received letters previously from the Butterfield Commons water system. Land use activities that occur within a SPA have the ability to negatively impact a water source. For example, activities such as improperly disposing of household hazardous wastes and motor oil; septic system failures; pesticide/fertilizer/herbicide application; and spillage of gasoline or home heating fuel all have the potential to contaminate a water source. If the groundwater that supplies the *Butterfield Commons* well becomes contaminated, it may be impossible to eliminate the contamination so that the source can continue to be used for drinking water.

We are contacting you to ask for your voluntary assistance in protecting this public water supply. Many of the negative impacts associated with land use activities can be avoided with good management. Property owners are often able to manage their land uses to further lower the risk of contamination and are a key player in helping to protect water resources. Several informational resources are available.

Thank you in advance for helping us protect the drinking water in our community.
Please feel free to contact me with any questions or concerns. The *Butterfield Commons Source Protection Plan* is available for review at the *Dover Town Clerk's Office* and the State of Vermont, DEC Drinking Water and Groundwater Protection Division.

Sincerely,

XXXXXXXXXX

Sample 3.

Dear Landowner,

The _____ public water system has developed a Source Protection Plan for their water system. The purpose of a Source Protection Plan is to identify vulnerabilities and to outline strategies to manage land uses and activities that potentially may contaminate a public water source. A copy of the plan is located at _____. Attached is a map of the Source Protection Area (SPA) and an informational brochure about maintaining your septic system.

The SPA defines the land surface area that is believed to contribute groundwater to our source wells. Your land is located in the source protection area and you may have already received letters previously. Within a source protection area, human land uses and naturally occurring materials may cause a public water system to become vulnerable to contamination. Land use activities that occur within a Source Protection Area have the ability to negatively impact a water source. For example, activities such as improperly disposing of household hazardous wastes and motor oil; septic system failures; pesticide/fertilizer/herbicide application; and spillage of gasoline or home heating fuel all have the potential to contaminate a water source. Many of the negative impacts associated with these activities can be avoided with good management. Property owners are often able to manage their land uses to further lower the risk of contamination.

Please feel free to contact me with any questions or concerns.
Sincerely,