ACT 154 CHEMICAL USE WORKING GROUP
REPORT ON TOXIC CHEMICAL USE IN THE STATE OF VERMONT

2016 Act 154, Section 10

Submitted to the
House Committee on Energy and Technology
House Committee on Natural Resources, Fish and Wildlife
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EXECUTIVE SUMMARY

During the winter of 2016, the State of Vermont discovered widespread contamination of private drinking water supplies with perfluorooctanoic acid (PFOA) in Bennington County. Hundreds of drinking water wells in Bennington County contain PFOA at levels above Vermont Department of Health Advisory levels. Perfluorinated compounds, including PFOA, are manufactured chemicals used to make a variety of commercial and household products that resist heat and chemical reactions, and repel oil, stains, grease, and water. PFOA does not break down easily and persists in the environment for decades, especially in water. Studies have shown a correlation between levels of PFOA in the blood in humans and high blood pressure, decreased birth weight, some immune system effects, thyroid disease, kidney cancer, and testicular cancer.

PFOA is a chemical of emerging concern (CEC), which generally means that it is a substance that has not been regularly monitored or thoroughly evaluated for risks, but that has the potential to enter the environment and cause adverse health impacts. Because PFOA is a CEC, it has been largely unregulated for decades under federal and Vermont laws that address end-of-the-pipe pollution. PFOA is just one example of the serious risks posed to human health and the environment from the approximately 85,000 chemicals on the federal Chemical Substance Inventory. The State of Vermont has insufficient toxicity information for many of these chemicals, and harmful chemicals like PFOA are effectively invisible to the laws in place to protect public health and the environment.

Act No. 154 (effective June 2016) directs the Agency of Natural Resources to convene a working group (Act 154 Chemical Use Working Group) to develop recommendations to the Vermont General Assembly aimed at closing regulatory gaps related to CECs like PFOA, increase the State's ability to prevent citizens from being exposed to harmful chemicals and other toxic substances, increase public access to information about chemicals in their community, and ensure that citizens harmed by releases of toxic substances have sufficient remedies under the law. Additionally, the members of the working group reviewed current federal and state regulatory programs, as well as laws in other countries, that address chemicals and other toxic substances. The Act 154 Working Group now presents this report as record of its work and its process in carrying out that work, and as an informational resource for the General Assembly in its consideration of policy recommendations to cure regulatory gaps and other deficiencies that pose risks to Vermonters and the environment from harmful chemicals.

Summary of Majority Recommendations

The policy recommendations summarized below received the support of a majority of the Act 154 Chemical Use Working Group members after working group members assessed deficiencies in the current legal framework for chemicals and toxic substances using a variety of methods, including LEAN processes. Given both the legislative mandate to develop recommendations to increase the protections in place to protect Vermonters from exposure to harmful chemicals and significant time constraints, the costs to the regulated community and state agencies, technical feasibility, and the decreased costs to Vermonters from reduced toxic exposure are largely not addressed in the majority policy

recommendations. The Working Group also did not assess the costs to Vermonters and the environment of taking no action to improve regulatory processes. These are all important considerations and should be considered in the context of specific legislation. The majority of the Act 154 Chemical Use Working Group recommends the following actions to strengthen protections for citizens:

- ***Increase Transparency and Efficiency by Strengthening Recordkeeping and Reporting Requirements***

- ***Increase Resources for Business and Strengthen Planning Requirements Under the Pollution Prevention Planning Program***

- ***Strengthen the Ability of the Department of Health to Prevent Exposure to Harmful Chemicals that Pose a Risk to Human Health***

- ***Increase Efficiency by Improving Coordination and Collaboration Among Agencies***

- ***Increase Public Access to Information About Chemicals***

- ***Strengthen Remedies Available to Vermonters to Address Violations of Pollution Laws and Exposure to Harmful Chemicals***

- ***Restrict the Use of Specific Chemicals that Pose a Risk to Public Health***

I. INTRODUCTION

This report sets forth the Act 154 Chemical Use Working Group's majority policy recommendations to strengthen the State's ability to protect citizens and the environment from exposure to harmful chemicals and toxic substances. The report also describes the process the Act 154 Chemical Use Working Group underwent to develop these recommendations. **Section I** provides a brief overview of the toxic chemical problem and the Legislature's charge to establish a working group to develop recommendations to address risks posed by harmful chemicals and toxic substances. **Section II** summarizes the deficiencies in the current legal framework and chemicals policy identified by the Act 154 Chemical Use Working Group. **Section III** summarizes the majority policy recommendations developed by the Act 154 Chemical Use Working Group.

The Act 154 Chemical Use Working Group assessed the current framework for chemicals regulation and significant deficiencies in a variety of ways given the complex nature of the chemical problem and the broad scope of the legislative charge. For example, the Act 154 Chemical Use Working Group looked broadly at the life-cycle phases of chemicals to evaluate systematic regulatory gaps, but also assessed specific regulatory program deficiencies. This report includes several Appendices that provide both summary level and more detailed information about the current chemicals regulatory landscape. In sum, this report presents information in different formats to provide the reader with an overview of the problem and possible solutions through a variety of perspectives.

The information contained in the Appendices is as follows:

- **Appendix A** is a list of the Act 154 Chemical Use Working Group members and Agency support staff.
- **Appendix B** includes a diagram that demonstrates the life-cycle phases of chemicals and other toxic substances and the potential pathways for entry into the environment and human exposure. In addition, a summary table of federal and state programs that address chemicals and toxic substances is included.
- **Appendix C** comprises detailed summaries of federal and state regulatory programs and databases that address chemicals and toxics substances.
- **Appendix D** is a detailed summary of regulatory requirements at state and federal levels, as well as requirements in other countries, for addressing threats from chemicals of emerging concern.
- **Appendix E** is a summary of public information about toxic and hazardous wastes and substances and chemicals of emerging concern in Vermont.
- **Appendix F** is an assessment of civil remedies available to Vermont citizens that have been adversely impacted by releases of chemicals and toxic substances.
- **Appendix G** contains the detailed policy recommendations supported by a majority of the Act 154 Chemical Use Working Group. These detailed recommendations include the specific

rationale for each policy recommendation. Appendix G also includes the results of the policy selection process that was conducted by the Working Group.

- **Appendix H** records comments from Working Group members and members of the public on the majority policy recommendations.

Background

Health advocates, scientists, and environmental agencies across the country have warned for decades that we are at risk from exposure to harmful chemicals in our drinking water, the air we breathe, our food supply and the products we use in our homes.[1] There are approximately 85,000 chemicals on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory.[2] This inventory is a cumulative list of all chemicals that have been introduced into commerce at some point since 1979 and is not solely a list of chemicals that are actively manufactured and processed.[3] The TSCA Chemical Inventory excludes insecticides, herbicides, rodenticides, pharmaceuticals, food additives, cosmetics, munitions, nuclear material, gases, and complex mixtures.[4] These substances can enter the air, groundwater, soils, and surface water and may pose a threat to human health and the environment. Yet for the vast majority of these chemicals, the State has little information about their toxicity and use in Vermont.

Although many of these substances are reviewed or regulated in some way, the level of review and regulations vary dramatically in terms of achieving adequate protection of human health and the environment.[5] For example, approximately 62,000 chemicals were presumed safe and "grandfathered" from safety testing at the time TSCA was enacted.[6] Since 1979, the U.S. Environmental Protection Agency (EPA) has reviewed approximately 40,000 new chemical submissions for safety.[7] However, prior to the enactment of the Frank R. Lautenberg Chemical Safety for the 21st Century Act (Lautenberg Act) in June of 2016, EPA was not required to make an affirmative determination that a new chemical was safe prior to the manufacture of the new chemical even where EPA had insufficient information to conclude the new chemical did not pose an unreasonable risk to the public.[8] EPA has required additional testing under TSCA for approximately 266 chemicals[9] and has subjected approximately 3,100 chemicals to further regulatory action to reduce risks to health or the environment.[10] In other cases, certain chemicals and classes of chemicals are not subject to reporting and management requirements under other federal and state environmental laws.[11] The result of the current regulatory framework is that the potential threats to human health and the environment from chemicals in commerce are largely unknown to the State of Vermont. The State does not have complete baseline information about chemical use (i.e., volume, location, and toxicity) in Vermont. This information is critical to enable the State to effectively respond to emergencies and threats posed by chemicals of emerging concern, and to prioritize limited resources to address those chemicals that pose the greatest risk to Vermonters.

Additionally, several state agencies share authority over chemicals regulation, creating an inefficient and duplicative regulatory system and making it challenging for businesses to navigate their regulatory obligations.[12] Further, it is difficult for the public to find current information about chemicals use in their own communities due to the lack of comprehensive reporting requirements, and because information is often stored in multiple locations and is difficult for the public to find. Finally, available

information may not clearly explain what is known and not known about health risks posed by specific chemicals.

Act 154 and the Working Group on Toxic Chemical Use in Vermont

The discovery of widespread contamination of drinking water with PFOA in Bennington County in 2016 highlighted significant deficiencies in the current legal framework and policy for chemicals management in the U.S. and Vermont. The Vermont General Assembly passed Act 154 in June of 2016 and directed the Agency of Natural Resources to establish a working group composed of "interested parties and parties with expertise in the field of toxic chemical use and regulation" to develop recommendations to strengthen the State's ability to protect citizens from exposure to harmful chemicals and toxic substances. Specifically, Section 10(a) directs the Act 154 Chemical Use Working Group "to develop recommendations for how to improve the ability of the State to: (1) prevent citizens and communities in the State from being exposed to toxic chemicals, hazardous materials, or hazardous wastes; (2) identify and regulate the use of toxic chemicals or hazardous materials that currently are unregulated by the State; and (3) inform communities and citizens in the State of potential exposure to toxic chemicals, including contamination of groundwater, public drinking water systems, and private potable water supplies."[13]

The Legislature directed the Act 154 Chemical Use Working Group to:

> (1) Identify the existing State or federal programs that establish reporting or management requirements regarding the use or generation of a toxic substance, hazardous waste, or hazardous material;
>
> (2) Evaluate the State or federal programs identified in subdivision (1) of this subsection to determine:
>
> (A) the program's effectiveness in preventing releases of toxic substances, hazardous wastes, or hazardous materials;
>
> (B) whether gaps or duplication exists between the programs that should be addressed to reduce threats to human health and the environment; and
>
> (C) whether the programs are adequately funded and staffed to meet their statutory and regulatory purpose;
>
> (3) Identify State or federal programs that require a response to the release of a toxic substance, hazardous waste, or hazardous material and assess their effectiveness in responding to releases in a manner that minimizes impacts to human health and the environment;

(4) Identify programs in place in other states that address the threat to human health and the environment from emerging contaminants and assess their effectiveness in accomplishing those objectives;

(5) Evaluate the State of Vermont's existing sources of publicly available information about toxic chemicals, including emerging contaminants, hazardous waste, and hazardous materials in Vermont;

(6) Evaluate whether civil remedies under Vermont law are sufficient to ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused; and

(7) Evaluate the obligations on the Environmental Contingency Fund established under 10 V.S.A. § 1283 and funding alternatives that would ensure the long-term solvency of the Fund.[14]

The Act 154 Chemical Use Working Group must submit findings and recommendations to the Senate and House Committees of Natural Resources and Energy and to the House Committee on Fish, Wildlife and Water Resources no later than January 15, 2017. Act 160 (2016) also directs the Agency of Natural Resources to evaluate the obligations on the Environmental Contingency Fund (ECF) and propose funding alternatives that would ensure the long-term solvency of the Fund. The Agency's Act 160 report on the ECF has been/will be finalized and submitted directly to the Committee(s) of….Thus, the Act 154 Chemical Use Working Group did not address this task.

II. IDENTIFICATION OF DEFICIENCIES IN CURRENT LEGAL FRAMEWORK AND POLICY

Act 154 (2016) charged the Working Group with identifying gaps or duplication in federal and State law that should be addressed to reduce threats to human health and the environment from chemical use in Vermont. To do this, the Working Group was asked to review existing state and federal programs that address the use, management, and clean-up of toxic substances, chemicals, hazardous waste, and other hazardous material. The Working Group was also asked to examine civil remedies available to private citizens harmed by releases of these harmful substances. A large body of information already documents significant deficiencies with respect to current U.S. chemicals policy.[15] In fact, the Vermont Advisory Committee on Mercury Pollution prepared a report to the Vermont Legislature in 2009 that identified significant and serious data, safety, and technology gaps in U.S. chemicals policy that create unacceptable risks to public health and the environment.[16] It is no surprise that the Working Group also identified numerous and significant deficiencies in the federal and state chemical regulatory landscape

that pose risks to the public and the environment from toxic chemicals, as well as duplicative regulation that places a burden on industry.

Overview of Process to Identify Deficiencies in Current Legal Framework and Policy

The Working Group met eight times and identified and analyzed gaps and other concerns in the current chemical regulatory landscape through: (1) review and discussion of background materials and presentations on chemicals policy and approaches to chemicals management in the U.S. and other states at multiple meetings; (2) subject matter expert review and discussion of current regulatory programs that address chemicals and other toxic substances; (3) two group exercises; and (4) development and discussion of policy recommendations that identified and analyzed regulatory gaps or other concerns that put the public and the environment in harm's way.

First, the Act 154 Chemical Use Working Group reviewed background material on chemicals policy in the U.S. and other states.[17] The working group members heard and discussed the following presentations: Joel Tickner (Thinking About Comprehensive Chemicals Policy); Ruma Kohli and Thom Jagielski (Overview of State, Federal, and Global Regulations); and Heather Tenney on the Massachusetts Toxics Use Reduction Act (TURA) and the Toxic Use Reduction Institute (TURI). During this time, a subgroup of Working Group members and Agency staff with expertise in regulatory programs created a regulatory matrix to identify the current regulatory landscape and began to identify specific gaps in protection and duplication that address threats to public health and the environment from chemicals and other toxic substances. This same group of subject matter experts conducted a comprehensive review of the regulatory programs identified in Appendix C of this report.

The Working Group then participated in group exercises to identify and discuss the goals of the Working Group and the regulatory gaps, duplication, and other concerns with respect to chemicals on October 19, 2016. Two Lean facilitators from the Agency of Natural Resources assisted the Working Group. At the end of each session, the Working Group members discussed the results of the exercise. A written summary of the results of the two exercises was circulated to the Working Group and made available to the public shortly after the October 19, 2016 meeting.

Finally, Working Group members were invited to submit policy recommendations for consideration by the larger group. Members that proposed a policy recommendation were asked to identify and analyze the regulatory gap(s) or other concern(s) the policy recommendation aimed to address. Specifically, Working Group members were directed to describe one or more gaps or deficiencies identified by the Working Group through the aforementioned group exercises, provide an overview of the root cause(s) of the problem resulting in the gap(s), and identify the threats to human health and the environment posed by the problem. The Working Group members discussed the submitted policy proposals on November 1, 2016 and were encouraged to discuss the policy recommendations informally between meetings. The Working Group members were given an opportunity to revise policy recommendations in response to comments from other members, including merging proposals or common components of proposals. On

November 17, 2016, the Working Group members discussed the original and revised proposals and then participated in a policy selection exercise to identify the majority recommendations.
Throughout the process, the Working Group encouraged participation by interested stakeholders and members of the public. The Working Group provided advance public notice of all meetings, and provided opportunities for any interested person to comment during the meetings and on materials prepared by the Working Group members. All written comments and proposals by interested parties were circulated to the Working Group for consideration. In addition, the Agency of Natural Resources created a public website specifically for the Working Group, which was frequently updated with information on working group meetings and materials, as well as information circulated to the members before and after meetings. Each meeting was recorded by ORCA Media, and the recordings were promptly uploaded to the website so that Working Group members and interested parties would have timely access to all presentations, materials, and discussions, even if they were unable to attend in person.

Summary of Act 154 Chemical Use Working Group Goals

In order to help guide the work of the working group members to identify deficiencies in the current regulatory landscape for chemicals and other toxic substances, the Working Group participated in a group exercise to identify the goals and values of the working group members related to chemicals and toxic substances. The Agency Lean facilitators led the group in an affinity diagram exercise that helped the group organize ideas into natural relationships. These exercises are often used where there are a large number of ideas that are potentially in conflict, where complex issues are involved, and where group consensus is helpful. The working group members began by writing out their top three goals or values for effective chemical and toxic regulation on individual post-it notes and randomly placing them on a large poster board. Without talking, the members organized the goals by grouping them together on the board until all of the goals were placed into groups. Once completed, the group discussed specific goals, how they were grouped, and the patterns that emerged. The working group members re-organized some of the goals. Finally, the working group members named each category according to the common themes among the goals that were placed in each group. The Agency staff reviewed the results of the goals exercise, summarized the results, including combining similar goals, editing goals for clarity, and grouping similar goals.

The chart below summarizes the results of this exercise.

ACT 154 CHEMICAL USE WORKING GROUP GOALS

Category 1: Working Group Process
Policy recommendations are/should be: • Simple and straightforward; • Identify and address regulatory gaps or other problems; and • Avoid duplication with existing regulations
Deeper understanding of current chemical regulations and reporting requirements
Vermont Legislators are aware of potential harms caused by toxic chemicals and routes of exposure
Category 2: Prevent Human and Environmental Exposure
Chemicals policy is grounded in the precautionary principle. Regulations: • Prevent exposure and releases in addition to ensuring sufficient emergency response and clean up; • Ensure products are safe before sold in Vermont.
Proactive identification and response to chemicals of emerging concern; other PFOA-like incidents are prevented
Research and development of "safe" chemicals
Reduce Vermonters' exposure to toxic chemicals at home, in the workplace, in our food, and in our environment
All Vermonters have equal access to a healthy environment free from toxic chemicals; Most vulnerable Vermonters are protected from exposure to toxic chemicals
Groundwater and drinking water supplies are free from chemical contamination and is safe to drink
Air is free from chemical contamination and is safe to breathe
Wildlife and fish are protected from toxic chemicals
Category 3: Public Access to Information About Chemicals
Easier for public to find information about chemicals they may be exposed to
Public has access to current information about toxicity of chemicals, including research on the safe use, risks, and potential adverse health effects of chemicals
Using EPCRA reporting system and infrastructure, state agencies engage effectively with manufactures, distributors, and users of chemicals
Public is informed early and often about the risks posed by use, storage, and presence of hazardous substances in communities

Category 4: State Authority/Approach to Address Risks Posed by Chemicals and Toxic Substances
State has sufficient authority to prevent exposures to toxic chemicals
State utilizes consistent regulatory approach to chemicals that may cause harm to human health or the environment
Closure of regulatory gaps based on potential for human exposure
State has a strategic plan to review and regulate chemicals of emerging concern
Chemicals are reviewed for safety and health risks before use
Chemicals that are an unsafe or have the potential to cause harm to humans and the environment are prohibited
State authority closes gaps in protection from federal laws
State assesses the effectiveness of current drinking water regulations to protect public health and public exposure to unregulated chemicals
All hazardous chemicals entering, leaving, or stored in Vermont are reported
Analytical method to monitor chemical is developed before chemical is put into use
Category 5: Harmonization of Regulations
County, state, federal, and international chemicals regulations are harmonized
State regulations are not duplicative of other state or federal regulations
State builds upon federal and international reporting requirements to collect chemicals data
Category 6: Emergency Planning
Best management practices are developed and followed for each industry
Local emergency planning committees have sufficient resources to develop comprehensive response plans for chemical releases

Summary of Deficiencies in Current Legal Framework and Policy

The Agency of Natural Resources' facilitators led the working group members in a second group exercise aimed at identifying regulatory gaps and other concerns related to chemicals and toxic substances that pose risks to public health and the environment. As part of this exercise, the Working Group worked together to identify regulatory gaps and other concerns with respect to chemicals and toxic substances in four categories: (1) reporting/disclosure; (2) management/prevention of releases; (3) remediation of releases; and (4) civil remedies for citizens harmed by chemicals.

For this exercise, the facilitators divided the working group members into four randomly-selected subgroups and assigned each subgroup to one of four designated stations. Each station was assigned one of four categories identified above. At each station, working group members wrote down gaps, limitations, and other concerns—which they were instructed to develop prior to the meeting—that they thought were associated with each specific category. The subgroups rotated to each station until all groups had an opportunity to identify gaps, limitations, and concerns related to each category. The

Working Group noted redundancies in gaps (i.e., if a gap or limitation was recognized by more than one member) by placing a check next to it. At the end of the exercise, each subgroup reported the results and led a discussion. The Agency staff reviewed the results of this exercise and summarized the results, including combining similar concerns and editing concerns for clarity.

The chart below summarizes the gaps, limitations, and other concerns identified by the Working Group during the group exercise. Appendices C through F identify regulatory and other gaps in protections from harmful chemicals and toxic substances afforded by federal and state regulatory programs, including Vermont law.

Overall Themes Appearing in Multiple Categories
Chemical by chemical approach is not effective or efficient
Most regulatory programs are reactive and do not focus on prevention
Lack of toxicity and other basic information about chemicals poses challenges for reporting, management, and clean-up of chemicals and hampers citizens' ability to recover damages when exposed to harmful chemicals
Coordination among state agencies occurs in Vermont, but it is not as effective as more centralized oversight
Burden should be on manufacturers to prove relative safety of chemicals as opposed to the government to demonstrate harm
Insufficient incentives for manufactures, users, and distributors to reduce risks
Category 1: Reporting/Disclosure
Chemical by chemical approach is not effective or efficient
Generally, no, limited, or voluntary reporting and disclosure requirements for many chemicals and emerging contaminants of concern
Generally, if a chemical is not on a "list", there is no reporting or disclosure requirements. Often, the lists for regulatory programs are not comprehensive.
Insufficient toxicity information about many chemicals
Information that is reported is not always easily accessible to the public
Confidential business information claims limit public access to information
Industry may lack information about its own chemical use (i.e. product manufacturers may have limited information about chemicals in components)
Small business may lack infrastructure in place to comprehensively record and manage chemical use

Category 2: Management and Prevention of Releases
Chemical by chemical approach is not effective or efficient
Lack of science, data, monitoring, and biomonitoring of chemicals to assess toxicity, synergistic effects of multiple chemicals, accumulative risk, and environmental health can make it difficult to effectively manage and prevent releases of chemicals
Lack of holistic life-cycle regulation of chemicals: • No requirement for prior study before use in market; • Lack of sufficient regulation and monitoring once chemicals enter market; • No comprehensive chemical inventory in Vermont; • Multiple agencies share authority over chemicals regulation; and • Insufficient labeling of chemicals and chemicals in products.
Thresholds are not always health-based, especially for most vulnerable populations
Insufficient regulatory incentives for identifying safer alternatives to harmful chemicals
Lack of clarity of requirements for "safer alternatives"
Testing to determine toxicity is expensive
Insufficient federal regulation and federal preemption may affect and limit State ability to effectively manage chemicals
Certain types of chemicals are exempt from regulation under TSCA
No or limited requirements for testing of private drinking water wells
Limited technical assistance, planning, and best practices to help businesses avoid or limit chemical use
Category 3: Clean-Up/Remediation
Lack of information on chemicals can make it difficult to identify existence and scope of contamination and effective remedy
Detection limits may not be sufficient to detect contamination at levels that are harmful to human health
May be difficult to determine when release occurred
Can be expensive to clean up and remediate toxic substances releases
Responsible parties may be hard to identify; may not have sufficient funds available; or may not otherwise be held responsible for clean up
In some cases, there is no defined release and no clear remediation technologies available
States have limited resources to address all releases of toxic substances
Citizens have limited tools to respond to releases of toxic substances
Once released into the environment, chemicals and toxic substances are much more expensive to clean up

Category 4: Civil Remedies
Liability is often "externalized" to general public
Lack of meaningful remedies for adverse health impacts caused by exposure to harmful chemicals
Insufficient funding for communities adversely impacted by exposure to harmful chemicals or other toxic substances
Citizens must overcome high bar to recover damages caused by exposure to harmful chemicals, including: • Can be difficult to identify exposure routes; • Demonstrating that harm was caused solely by exposure to a specific chemical can be difficult for a citizen to prove; • Statute of limitations may run before citizen experiences adverse health impacts from exposure; • Burden of proof and evidentiary standard for technical experts is high; • Can be difficult to value human health and environmental costs associated with exposure; • Can be difficult to identify responsible parties or responsible parties are shielded from responsibility (i.e. complex corporate structures, bankruptcy, etc.)
Difficult for citizens to recover costs of medical monitoring and impacts after exposure even if legal claims are pursued

III. RECOMMENDATIONS TO GENERAL ASSEMBLY

Overview of Policy Selection Process

Once the final set of policy proposals were developed, the Agency facilitators assisted the Working Group with the policy selection process. The goal of the exercise was to identify the proposals that received the support of a majority of the Working Group members, if any.

Prior to the policy selection exercise, the facilitation team led the group through a discussion of ground rules. There are twenty working group members. Each working group member was able to take one position on each policy proposal: (1) support entire proposal; (2) support a portion of the proposal; (3) oppose proposal; or (4) take no position on the proposal at this time. All proposals—or portions of proposals—receiving eleven or more votes of support was identified as a majority recommendation and is included as a recommendation to the General Assembly below. Each majority recommendation is summarized and explained below; complete proposals that were selected as majority policy recommendations are attached in Appendix G. These proposals include the specific rationale for each policy recommendation. Working group members were provided with an opportunity to submit comments on any majority policy recommendation. These comments are available in Appendix H.

Majority Policy Recommendations

The Working Group was directed in Act 154, Section 10(a) to "develop recommendations to improve the ability of the State to (1) prevent citizens and communities in the State from being exposed to toxic chemicals, hazardous materials, or hazardous wastes; (2) identify and regulate the use of toxic chemicals or hazardous materials that currently are unregulated by the State; and (3) inform communities and citizens in the State of potential exposure to toxic chemicals, including contamination of groundwater, public drinking water systems, and private potable water supplies." The majority of the working group members support the policy recommendations summarized below to address this charge. For a more detailed discussion of the policy recommendations and the rationale for these majority recommendations, please see the complete policy recommendations located in Appendix G.

Given both the legislative mandate to develop recommendations to protect Vermonters from exposure to harmful chemicals and significant time constraints, the costs to the regulated community and state agencies, technical feasibility, and the decreased costs to Vermonters from reduced toxic exposure are largely not addressed in the majority policy recommendations. The Working Group also did not assess the costs to Vermonters and the environment of taking no action to improve regulatory processes. These are all important considerations that should be considered in the context of specific legislation.

i. Increase Transparency and Efficiency by Strengthening Recordkeeping and Reporting Requirements

Problem: A significant number of chemicals are manufactured, imported, transported, used, and disposed of daily in Vermont. One of the major problems identified by the Act 154 Chemical Use Working Group is a lack of data with respect to toxicity information and chemical use (type, volume, and location) in Vermont. The State does not have a baseline understanding of all chemicals in use, and where they are used, within the State. Without this information, it is challenging for the State to respond to emergencies and threats posed by chemicals of emerging concern, and review and assess which chemicals the State should regulate. Additionally, a lack of a coordinated and streamlined approach to chemicals regulation among State agencies results in an inefficient and duplicative reporting system that can be difficult for businesses to navigate.

Recommendations:

- Expand upon existing reporting requirements to require users, manufacturers, importers, and distributors of chemicals to report inventories of all chemicals to the State on an annual basis subject to appropriate thresholds for recordkeeping and reporting requirements.

- Expand pesticide use reporting requirements beyond commercial applications and identify sales to consumers at the point of sale or distribution in the State.

- ❖ Create a streamlined electronic reporting system and other tools to reduce duplication and make it easier for businesses to comply with recordkeeping and reporting requirements.

ii. Increase Resources for Businesses and Strengthen Planning Requirements Under the Pollution Prevention Planning Program

Problem: The list of chemicals triggering reporting and planning requirements under the Pollution Prevention Planning Program has not been updated since 1991. Further, the current program does not offer up-front planning assistance for companies that are required to act under Act 100 or require that planners certified by the State sign off on plans before submission.

Recommendations:

- ❖ Institute a certified planner requirement and implement technical assistance for businesses that report toxic chemicals or hazardous substances.

- ❖ Update the 1991 list of chemicals that trigger reporting and planning requirements to include chemicals listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); chemicals of high concern in children's products identified pursuant to Vermont Act 188; and California's Initial Candidate Chemical List.

- ❖ Institute lower reporting thresholds for companies that use persistent bioaccumulative toxics (PBTs).

iii. Strengthen the Ability of the Department of Health to Prevent Exposure to Harmful Chemicals that Pose a Risk to Public Health

Problem: The Vermont Toxic Free Families Act of 2014 (Act 188) restricts the Department of Health's authority to require labeling or restrict the use of chemicals of high concern in children's products even when there is significant scientific evidence to support such an action. Act 188 is limited to a small percentage of consumer products and product manufacturers are not required to report both the product name and universal product code.

Recommendations:

- ❖ Expand Act 188 to include all consumer products and require reporting of product name and universal product code.

- ❖ Revise Act 188 to provide the Department of Health with authority to restrict or label chemicals of concern independent of an Act 188 Working Group recommendation.

- ❖ Revise Act 188 to ensure the Department of Health has the authority to act to protect Vermonters from exposure to chemicals of concern in products when there is sufficient scientific support for action.

iv. Increase Efficiency by Improving Coordination and Collaboration Among Agencies

Problem: Several state agencies share authority—sometimes overlapping—over chemicals regulation and there is no single agency charged with evaluating potential risks to human health and the environment from unregulated chemicals and identifying actions to minimize risks.

Recommendations:

- Create an inter-agency advisory committee to review and evaluate chemical inventories on an annual basis to identify potential risks to human health and the environment and measures to address those risks. Specifically, the new advisory committee should:

  (a) be comprised of a representative from the Agency of Agriculture, Agency of Natural Resources, Department of Health, Department of Labor, and the Department of Public Safety;

  (b) convene and consult with a policy advisory panel that will consist of members with expertise in toxicology, environmental law, pollution prevention, environmental health, public health, risk analysis, maternal and child health care, occupational health, industrial hygiene, and public policy;

  (c) identify an agency or agencies to create a streamlined electronic reporting system and develop tools to make it easier for businesses to comply with regulatory requirements;

  (d) develop streamlined reporting forms and guidance for businesses to help ensure compliance with existing and expanded reporting requirements through a single unified reporting system

  (e) track and notify the relevant State agencies of any "action" taken by EPA to regulate chemicals under the TSCA/Lautenberg Amendments that could affect any State regulatory decision;

  (f) review chemical inventories and emerging scientific evidence on an annual basis and identify chemicals of high concern; and

  (g) identify actions or strategies to reduce health risks from exposure to chemicals of high concern and risks of harm to the natural environment, including the development of regulatory standards, sampling of private drinking water supplies, and other necessary actions to protect Vermonters.

  (h) The creation and duties of the interagency committee shall not limit the independent authority of the Agency of Agriculture, Agency of Natural Resources, Department of Health, Department of Labor, and the Department of Public Safety to regulate chemicals.

- Fund one dedicated senior staff position to support the work of the interagency committee.

v. Increase Public Access to Information About Chemicals

Problem: There is currently no single electronic database that provides resources and chemical use data in an easy-to-digest format for Vermont businesses, agencies, and the public. There is a lack of easily-accessible comprehensive information for Vermonters to evaluate the risks associated with the presence of harmful chemicals in their communities.

Recommendations:

- ❖ Create a new Agency of Natural Resources Natural Resources Atlas data layer(s) with information on the use, manufacture, importation, and distribution of chemicals in a format that is accessible to the public. At a minimum, this data layer should include complete chemical inventory information reported to the State, including location; information submitted to the Agency pursuant to the Pollution Prevention Planning Program; and information about pesticide use.

- ❖ Improve existing data structures within the Agency of Agriculture to compile and provide meaningful data to the public about pesticide use and require Agency of Agriculture to coordinate and share pesticide use information and information regarding risks associated with pesticides with an interagency committee and the public through a new Agency of Natural Resources Atlas data layer.

- ❖ Require testing of private drinking water supplies when property is transferred.

- ❖ Increase fees on toxic substances, hazardous waste, and/or chemicals of concern to fund expansion and improvements to the Natural Resources Atlas and subsidize the cost of testing drinking water and groundwater in areas where the Agency of Natural Resources determines that the risk of contamination of water supplies is high.

vi. Strengthen Remedies Available to Vermonters to Address Violations of Pollution Laws and Exposure to Harmful Chemicals

Problem: The existing civil remedies are insufficient to ensure Vermonters are protected from releases of harmful chemicals and other toxic substances and that persons responsible for such releases pay for harm.

Recommendations:

- ❖ Enact a citizen suit provision modeled after federal law to allow citizens to enforce alleged violations of 10 V.S.A. § 6616 or alleged violations of a permit, condition, standard, limitation, or order issued under Title 10 for the release of a hazardous material as defined in 10 V.S.A. § 6602.

- ❖ Authorize individuals to recover the expense of medical monitoring for latent diseases and other ailments where individuals have been exposed to toxic substances as a result of a defendant's tortious conduct and, due to this exposure, have an increased risk of developing diseases, ailments, or other physiological changes.

- ❖ Adopt a strict joint and several liability standard for harm to private citizens by the release of toxic chemicals into the environment and allow parties held liable for toxic chemical releases to seek contribution from any other responsible party, including chemical manufacturers for failing to warn of the chemical's propensity to cause harm.

vii. Restrict the Use of Specific Chemicals that Pose a Risk to Public Health

Problem: Studies have shown that some poly- and perfluoroalkyl substances (PFASs) disrupt normal endocrine activity; reduce immune function; cause adverse effects on multiple organs, including the liver and pancreas; and cause developmental problems in rodent offspring exposed in the womb. Further, a panel convened to examine the impacts of long chain PFASs found probable links between these chemicals and 55 diseases, including 21 types of cancers. PFASs are used to coat many products such as dental floss, microwave popcorn bags, cookware, and pizza boxes.

Recommendation:

- ❖ Ban the use of poly and perfluoroalkyl substances (PFASs) from food contact substances and dental floss.

[1] *See, e.g.*, Wilson et al., Center for Occupational and Envtl. Health, School of Public Health, University of California at Berkeley, Toward a New U.S. Chemicals Policy: Rebuilding the Foundation to Advance New Science, Green Chemistry, and Environmental Health (2009); Lowell Center for Sustainable Production, Options for State Chemical Policy Reform: A Resource Guide (2008); Maine Governor John E. Baldacci's Task Force to Promote Safer Chemicals in Consumer Products, Final Report (Dec. 2007); The Centers for Occupational and Environmental Health, University of Berkeley, Green Chemistry: Cornerstone to a Sustainable California (2008); and California Department of Toxic Substances Control, California Environmental Protection Agency, California Green Chemistry Initiative, Final Report (2008).

[2] U.S. Envtl. Prot. Agency, TSCA Chemical Substance Inventory, https://www.epa.gov/tsca-inventory/about-tsca-chemical-substance-inventory (last visited on Jan. 10, 2017).

[3] *Id.* Under the recently enacted Frank R. Lautenberg Chemical Safety for the 21st Century Act, the U.S. Environmental Protection Agency will be updating the TSCA Chemical Substance Inventory to distinguish between chemicals that are actively manufactured or processed and chemicals that are inactive and no longer manufactured or processed. 15 U.S.C. § 2607(b)(4) (2016).

[4] 15 U.S.C. § 2602(2)(B).

[5] *See* Appendix C. TSCA was recently amended to improve EPA's ability to protect public health and the environment from chemicals in commerce. *See* Frank R. Lautenberg Chemical Safety for the 21st Century Act, Pub. L. No. 114-182 (2016).

[6] *See, e.g.*, Major Colin P. Eichenberger, Improving the Toxic Substances Control Act: A Precautionary Approach to Toxic Chemical Regulation, 72 A.F. L. Rev. 123, 131 (2015) ("From 1979 to 1982, the EPA identified 62,000 chemicals in commerce, included them on their chemical inventory, but never subjected the substances to testing, data collection or regulation.").

[7] U.S. Envtl. Prot. Agency, Statistics for the New Chemicals Review Program Under TSCA, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/statistics-new-chemicals-review (last visited January 10, 2017).

[8] *Compare* 15 U.S.C. § 2604(a) (1976) and 15 U.S.C. § 2604(a)(1) – (3) (2016). Section 4 of TSCA provided EPA with authority to promulgate a rule to require testing under certain circumstances where EPA has insufficient information to determine whether a chemical presents an unreasonable risk to public health or the environment. *See* 15 U.S.C. § 2603(a) (1976).

[9] U.S. Envtl. Prot. Agency, Sunset Dates of Chemicals Subject to Final TSCA Section 4, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/sunset-dates-chemicals-subject-final-tsca-section-4-test (last visited on January 10, 2017).

[10] U.S. Envtl. Prot. Agency, Statistics for the New Chemicals Review Program, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/statistics-new-chemicals-review (last visited January 10, 2017).

[11] *See* Appendix C of this report.

[12] *Id.*

[13] Act No. 154, Section 10(a).

[14] *Id.* § 10(b).

[15] *See supra* note 1.

[16] Advisory Committee on Mercury Pollution, Opportunities for Action on Toxic Chemicals (Jan. 2009).

[17] Integral Consulting, Inc., A Compendium of State Regulatory Authorities on Emerging Contaminants (May 2016); Wilson et al., Center for Occupational and Envtl. Health, School of Public Health, University of California at Berkeley, Toward a New U.S. Chemicals Policy: Rebuilding the Foundation to Advance New Science, Green Chemistry, and Environmental Health (2009); University of Minnesota Department of Health, Contaminants of Emerging Concern Program Process for Selecting Chemicals (May 2016).

APPENDIX A

Acknowledgements and List of Act 154
Chemical Use Working Group

ACT 154 CHEMICAL USE WORKING GROUP
MEMBERS AND REPRESENTATIVES

The Agency of Natural Resources would like to thank all the members of the Act 154 Chemicals Working Group for their participation, time, and contribution of information and constructive discussion surrounding this very important initiative.

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APPENDIX B

Diagram of Chemical Life Cycle and Summary Table of Statutes, Programs, and Databases

LIFE-CYCLE DIAGRAM – FIGURE 1

Figure 1 depicts the life-cycle phases of chemical substances and the potential pathways for those substances or by-products to enter the environment and/or result in human exposure.

Major life-cycle phases are simplified and depicted in the center of the Figure. Thousands of chemicals in common use move through phases of the life-cycle from extraction of the raw material, to manufacturing, to disposal of the end-product. The inner ring depicts the life-cycle from raw material through production, use, and disposal. The middle ring depicts the processes which may occur at any phase in the life-cycle. The outer ring depicts processes or pathways which can lead from human use and/or the built environment into the natural environment of air, earth, and water: this outer ring therefore represents the ways in which traditional pollution occurs. Distribution and transportation occur between these phases/rings, as do ancillary or associated processes.

Understanding the life-cycle of manufactured chemicals, materials, and products (and the relationships between and among them) helps regulators in identifying and evaluating potential impacts to humans and the environment that might be present throughout the various phases. This information will be critical in helping regulators, and Vermont legislators, to better understand chemicals and their risks prior to their use, effectively evaluate alternatives, and support more sustainable chemical design and use.

Following the Life-Cycle Diagram is a summary table of statutes and regulatory programs that regulate chemicals in Vermont, other states, and on the federal level, as well as a list of public information resources where the public can access information about chemicals and toxic use. Most of the regulatory programs and their requirements identified in this table are more fully described in **Appendix C** of this report, while additional information regarding publicly-accessible databases and resources regarding chemical and toxics use in Vermont is included in **Appendix E** of this report.

Chemicals and contaminants life cycle (center) and associated processes and pathways which result in environmental and human exposure.

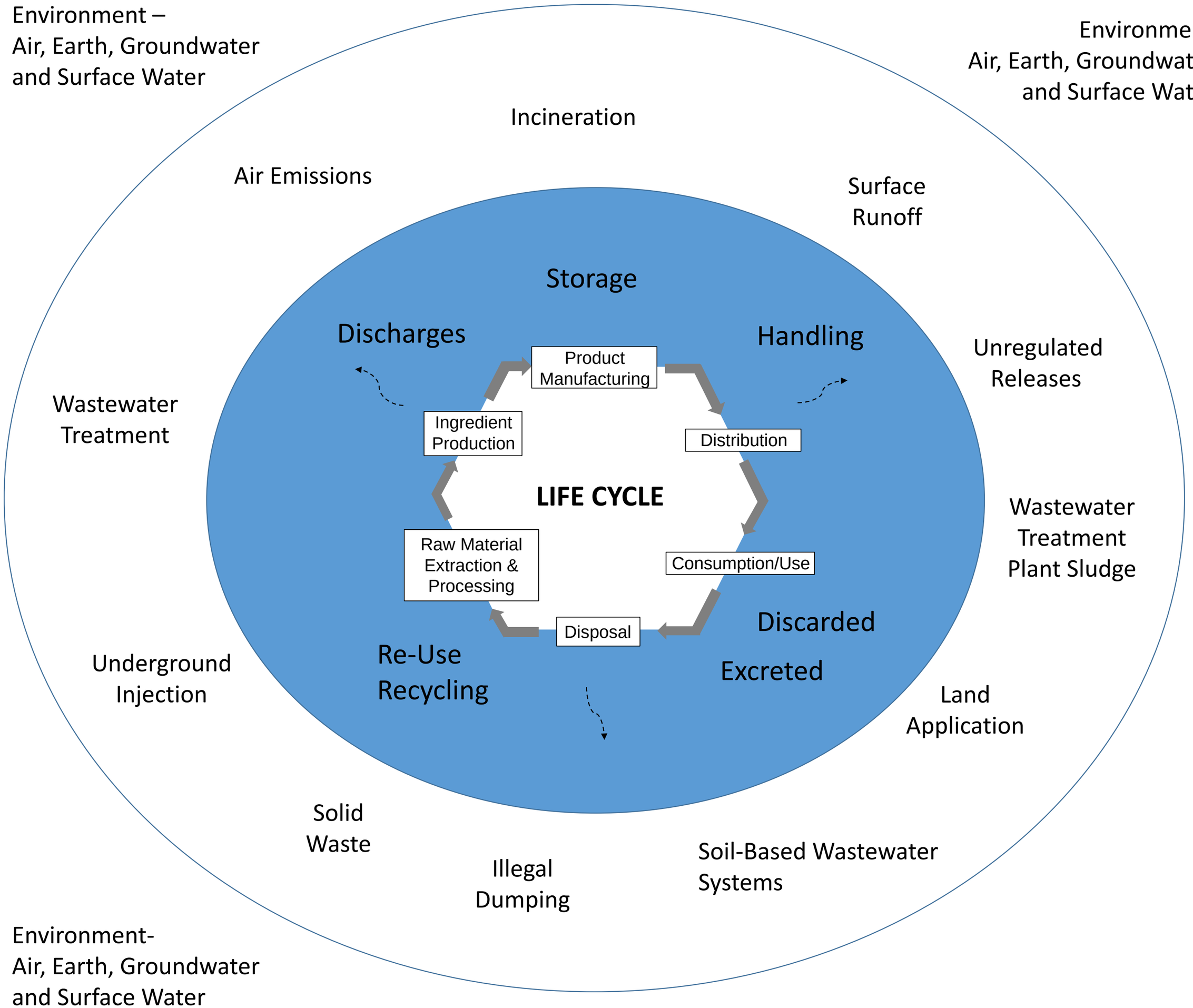

Figure 1

Summary Table of Vermont and Federal Programs, Acts and Databases

The table summarizes state and federal regulatory programs that are referenced in the report.

Abbreviated name (Who)	What	How
Existing State and Federal Programs that establish reporting and/or managament requirements for generation and use of toxic substances, hazardous wastes or hazardous materials.		
VTDEC WMPD	Waste Management & Prevention - Hazardous Waste Management Regulations	Conducts inspections; tracks Hazardous waste manifests; issues permits; tracks hazardous waste data and provides regulatory assistance. 3 VSA §2853(5) and 10 VSA Chapter 159.
VTDEC WMPD	Waste Management & Prevention Storage Tanks	Helps prevent contamination caused by leaking underground and above ground petroleum storage tanks. Oversees self-certification inspection program; conducts inspections; issues permits. 10 VSA Chapters 59 and 159.
VTDEC WMPD	Residual Waste and Emerging Contaminants Program	Implements federal regulations under 40 CFR Part 503 and 10 VSA §6602 - the program oversees Sludge Management Plans, Solid Waste Certifications and Residuals reporting.
VTDEC AQCD	Air Quality and Climate Division	Implements state regulations and the federal Clean Air Act by monitoring ambient air quality and air pollution emissions from sources; proposes regulations to improve existing air quality; ensures compliance with the regulations; and issues permits to control pollution from sources of air contaminants across the state. Vermont Air Pollution Control Laws - Title 10 Conservation and Development; Part I Development of Resources, Chapter 23 Air Pollution Control.
VTDEC DWGWPD	Drinking Water & Groundwater Protection Division - Water Supply Rule	Implements and enforces the Federal Safe Drinking Water Act and Vermont Statues to protect public and non-public water systsems; works with drinking water systems; performs sanitary surveys; administers rules; permitting; works under the Water Supply Rule and the Groundwater Protection Rule and Strategy. 10 VSA Chapter 48, 10 VSA Chapter 56, 10 VSA Chapter 61, 18 VSA §1218, 3 VSA §2822(j), 18 VSA §501b, 18 VSA §503, 24 VSA Chapter 120, 42 USC 300f, 40 CFR Parts 141-143.
VTDEC DWGWPD	Drinking Water & Groundwater Protection - Groundwater Protection Rule & Strategy	The purpose is to establish classes of groundwater; a process for groundwater reclassification; standards for groundwater quality protection and to ensure that DEC regulatory programs protect groundwater resources. no new regulatory authority directs the Secretary to protect groudnwater through existing programs; This is currently overseen by the Groundwater Coordinating Committee. 10 VSA Chapter 48; 10 VSA §1390-1394.
VTDEC DWGWPD IDR	Drinking Water & Groundwater Protection - Indirect Discharge	Chapter 14 of the Environmental Protection Rules contain the requirements for permitting land-based, sewage disposal facilities.
VTDEC DWGWPD UIC	Drinking Water & Groundwater Protection - Undergound Injection Control	Federal Safe Drinking Water Act gives authority to control underground injection to protect drinking water sources. The UIC Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal. Final UIC Rule, October 29, 2014; Vermont Groundwater Protection Rule and Strategy.
VTDEC WMD	Watershed Management Division	10 VSA Chapter 47 - once a classification of any waters has been established, those waters shall be managed by the Secretary in order to obtain and maintain the classification. A triennial review of State water quality standards is required by the Clean Water Act. Monitoring, Assessment & Planning program, Vermont Clean Water Initiative Program, Vermont Clean Water Act (Act 64) and Clean Water Fund - implementation of water quality standards.
VTAAFM ARM	Vermont Agency of Agriculture Food & Markets Agricultural Resource Managment Division	Regulates pesticides, feed, seed and fertilizers; Vermont's Pesticide Regulations; Pesticide and Groundwater Monitoring Program; Annual usage report; 6 VSA Chapters 81 and 87. Water Quality administers Required Agricultural Practices for non-point source pollution control and their associated Best Mangement Practices.
VTDOH	Vermont Department of Health Chemical Disclosure Program for Children's Products	Act 188 - establishes reporting protocol for manufactures who use certain chemicals in children's products; list of priority chemicals - requires disclosure and reporting. Agency also manages Vermont's Environemtnal Public Health Tracking network (national network to track expsoures and health effextds related to potential environmental hazards).
VTDPS DFS	Divison of Fire Safety Emergency Response	Manages reporting program for hazardous chemicals established under EPCRA and Vermont Community Right to Know Program. SARA Title III - Tier II reporting to local and state emergency responders - includes quanitities and locations of hazardous chemicals at a facility.

Summary Table of Vermont and Federal Programs, Acts and Databases

The table summarizes state and federal regulatory programs that are referenced in the report.

Abbreviated name (Who)	What	How
USDHHS ATSDR	Agency for Toxic Substances and Disease Registry	Provides health information to prevent harmful exposures and diseases related to toxic substances found at National Priority sites, was later broadened to include public health assessments and the establishment and maintenance of toxicologica databases - Toxics Substance Portal.
USDHHS CDC	Centers for Disease Control and Prevention National Biomonitoring Program	National Biomonitoring Program (NBP), National Environmental Public Health Tracking; The National Institue for Occupational Safety and Health (NIOSH); Toxic Substances Portal; National Toxicology Program - National Institue of Environemtnal Health Sciences - tests and evaluates substances in our environement; The NTP Office of Health Assessment and Translation (OHAT) conducts assessments on adverse effects of substances on human health.
USDHHS FDA	Food and Drug Administration	Monitors for industrial chemicals, cooking or heating related chemicals and other chemical contaminants in food; assesses potential expsoure and risk posed by these chemicals; legal responsibility for determining the safe use of food additives; regulates over-the- counter and prescription drugs; animal drug safety; Consumer Product Safety Commission which develps safety standards and implements teh federal Hazardous Substances Act and the Poison Prevention Packaging Act (labeling).
USDOD CMRMP	Department of Defense Chemical and Material Ris Management Program	Identifies and manages risk associated with DoDs mission.
USDOL	Occupational Safety & Health Administration Hazard Communication Standard	Occupational Safety and Health Administration (OSHA) - The Hazard Communication Standard (HCS); NIOSH and OSHA work together to establish worker safety standards; Authority under 29 CFR 1910.
USDOT PHMSA	Pipeline and Hazardous Materials Safety Administration	Regulates the transport of hazardous materials - regulates the safe and secure movement of hazardous materials to industry and consumers by all modes of transportation; Title 49 CFR Parts 100-185.
USEPA CAA	Clean Air Act	Gives EPA authority to limit emmissions of air pollutants coming from sources like chemical plants, utilities and steel mills; states and tibes may have more strict limits but not less; operating permits; SIPs with states.
USEPA CWA	Clean Water Act	EPA Office of Water is responsible for implementing the Clean Water Act and Safe Drinking Water Act which regulates discharges of pollutants into the waters of the US. EPAOW provides guidance, specifies scientific methods and data collection requirements, performs oversight adn facilitates communication among those involved.
USEPA CERCLA EPCRA	Emergency Planning & Community Right-to-Know Act	In 1986 congress passed the Superfund Amendments and Reauthorization Act (SARA) which amended the Act to including the Emergency Planning and Community Right-to-Know Act (EPCRA). It is also known as Title III - SARA - this law is intended to help local communities protect public health, safety and the environement from chemical hazards by requiring states to appoint a state emergency response commission (SERC). Reporting; Waste, Chemical and cleanup Enforcement. 1. Emergency planning 2. Emergency release notification 3. Hazardous chemical storage reporting requirements, and 4. Toxic chemical release inventory.
USEPA FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act	All pesticides distributed or sold in the US must be registered by EPA. There is also the Federal Food, Drug and Cosmetic Act which sets tolerances or maximum residue limits for pesticide residue on foods.
USEPA OPA	Oil Pollution Act	33 USC §2710 - Office of Emergency Managemnt (OEM) - this act strengthened EPA's ability to prevent and respond to catastrophic oil spills. Requires oil storage facilites and vessels to submit to the Federal government plans detailing how they will respond to large discharges.
USEPA RCRA	Resource Conservation and Recovery Act	42 USC §6901 - "cradle to grave" authority including the generation, transportation, treatment, storage and disposal of hazardous waste. Established framework for managemnt of non-hazardous solid wastes.
USEPASDWA	Safe Drinking Water Act	Federal law that protects public drinking water supplies - sets standards for drinking water quality and implements technical and financial programs to ensure drinking water safety.
USEPA TSCA	Toxic Substances Control Act	Provides EPA with authority to require reporting, record-kepping and testing requirements and restrictions relating to chemical substances and/or mixtures (food, drugs, cosmetics and pesticides are excluded). Addresses the production, importation, use and disposal of specific chemicals includeing PCBs, asbestos, radon and lead based paint. TSCA Inventory - contains >83,000 chemicals.

Summary Table of Vermont and Federal Programs, Acts and Databases

The table summarizes state and federal regulatory programs that are referenced in the report.

Abbreviated name (Who)	What	How
Existing State and Federal Programs that require a response to releases of toxic or hazardous wastes and substances.		
VTAAFM ARM	Agricultural Resource Managment Pesticide Regulations	The Pesticide Management Section within the Agricultural Resource Management Division of the Agency of Agriculture Food & Markets manages pesticide permitting activities, provides and approves training courses in the handling, storage and use of pesticides, conducts examinations to determine that pesticide applicators are competent to follow prescribed pest control practices, enforces State and Federal laws on teh sale and use of pesticides and investigates pesticide accidents, incidents and consumer complaints on pesticide use.
VTDEC WMPD	Waste Management & Prevention - Spill Team	Immediate Response - VHWMR 7-105, 10 VSA Chapter 159: Waste Management - 6615. Liability; 6615a. Diligent and appropriate investigation for hazardous materials; 6616. Release prohibition; 6617. Person responsible for release: notice to agency - assesses environmental impact of hazardous materials spills, oversees the cleanup of spills and enforces environemtnal laws and regulations triggered by spills.
VTDEC WMPD	Waste Management & Prevention Division - Contaminated Sites	Long term cleanup - 10 VSA Chapter 159: Waste Management - 6615. Liability; 6615a. Diligent and appropriate investigation for hazardous materials; 6615b cleanup procedures; 6616. Release prohibition; 6617 Person responsible for release: notice to agency; also Act 164 10 VSA Section 6642 - assists property owners, prospective purchasers, environemental consultants and other interested parties in the the remediation of contaminated properties.
VTDEC DWGWPD	Drinking Water and Groundwater Protection - Laws and Regulations	Public water system suppliers are required to provide public notification of violations of drinking water standards in accordance with 40 CFR, Part 141, Subpart Q.
VTDEC AQCD	Air Quality and Climate Division Laws and Regulations	VAPCR 5-800 and VAPCR 5-402 permit the AQCD to require reportin gof actual annual emissions of air contaminants of a facility.
VTDEC WMD	Watershed Management Division, Wastewater, Notice of Untreated Sewage	Act 86 requires the release of any less than fully treated sewage to waters of the state to be posted on the Department's website.
VTDPS DEMHS	Division of Emergency Management and Homeland Security	This division works with other state and federal entities to provide respsone support during emergencies. This is also where the Tier II Compliance Program is managed for EPCRA requirements. 20 VSA §33.
EPA CERCLA	EPA Emergency Response	EPA responds to oil spills, chemcial, biological, radiological releases, and large-scale national emergencies. They also provide assistance when requested. The federal program CERCLA, provides a federal "superfund" to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminatns into the environement. Compliance monitoring of hazardous waste facilities and Underground Storage tank facilities is regulated through RCRA, and the Clean Air Act gives EPA authority to enfoce accidental release requirements.

Summary Table of Vermont and Federal Programs, Acts and Databases

The table summarizes state and federal regulatory programs that are referenced in the report.

Abbreviated name (Who)	What	How
Programs in other states that address threats from Emerging Contaminants		
CA	Toxic Substances Control - Candidate Chemicals List	California maintains a comprehensive list as required by Proposition 65, the list is compiled from 23 "authoritative lists". The Candidate Chemicals List is compiled from 23 "authoritative lists" identified in the Safer Consumer Products Regulations (Cal. Code Regs., tit. 22, § 69502.2, subd. (a)). The authoritative lists fall into two categories: 1) "hazard trait lists" of chemicals § 69502.2 (a)(1)); and 2) "exposure potential" lists (§ 69502.2, subd. (a)(2)).
MA DEP ECW	Departement of Environmental Conservation Emerging Contaminant Workgroup	Identifies and assesses public health and environmental problems associated with currently unregulated or under-regulated contaminants, and recommends agency strategies for addressing them; developed the 2013 Emerging Contaminant Priority List.
MN MDH	Department of Health Contaminants of Emerging Concern	Legislative mandate (funded) to address public health concerns related to contaminatns found in MN drinking water where no health based standards exist. A process review of the program was conducted by the University of Minnesota in 2016. The report is included on the webpage.
OR DEQ WQ	Department of Environmental Quality Water Quality Addressing Priority Pollutants in Oregon's Water	Legislative mandate requiring the DEQ to develop a list Senate Bill 737. The Oregon Department of Environmental Quality developed a list of persistent pollutants that should be limited from entering the environment through effluent from wastewater treatment facilities. Oregon evaluated potential contaminants and relied on pre-existing national lists to develop a list of 118 pollutants and assign trigger levels for action. Facilities must monitor for these CECs and submit plans to reduce the levels in effluent.
WA	Washington State Administrative Code Persistent Bioaccumulateve Toxins	The Toxics Studies Unit in the Department of Ecology, State of Washington conducted studies on CECs. Some recent studies include assessments of PPCP in municipal wastewater and runoff from roofing materials. The Department also includes a persistent bioaccumulative toxics (PBT) monitoring program with projects to support Chemical Action Plans (CAP). A CAP is not legislation or a rule.
Integral Consulting Report	Compendium of State Regulatory Activies on Emerging Contaminants	This is a broad report on activities in all 50 states conducted by a private firm. It's not clear in the report who funded this project.
USEPA CCL	Contaminant Candidate List	The USEPA develops Contaminant Candidate Lists (CCL3 and a CCL 4 draft), which list contaminants that are known or anticipated to occur in public drinking water systems and are not currently subject to EPA drinking water regulations. The lists include substances which in the future may require regulation under the Safe Drinking Water Act (SDWA). The CCL only applies to drinking water. The CCL3 and CCL4 lists include approximately 100 emerging contaminants in public drinking water including pesticides, disinfection by-products, chemicals used in commerce, waterborne pathogens, pharmaceuticals and biological toxins.
USEPA UCMR3	Third Unregulated Contaminant Monitoring Rule	The 1996 Safe Drinking Water Act (SDWA) amendments require that once every 5 years EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems (PWS).
USEPA TSCA	Toxic Substances Control Act Chemical Substance Inventory	The TSCA inventory contains all existing chemical substances manufactured, processed, or imported in the United States that do not qualify for an exemption or exclusion under TSCA. In addition, the USEPA TSCA new chemicals list applies to any chemical that is not in the TSCA Inventory. The manufacturer must submit a pre-manufacture notice to EPA and some will be placed on the TSCA Inventory. The process was recently amended in 2016 and changes are being implemented.
USEPA IRIS	Integrated Risk Information System	The Integrated Risk Information System (IRIS) is a human health assessment program that evaluates information about effects from exposure to environmental contaminants. The IRIS database is a compilation of reports on substances found in the environment and their potential to cause human health effects. EPA's IRIS Program identifies and characterizes the health hazards of chemicals found in the environment. Each IRIS assessment can cover a chemical, a group of related chemicals, or a complex mixture. IRIS assessments are the preferred toxicity information used by EPA to set regulatory guidelines.
USGS TSHP	Toxics Substances Hydrology Program - Contaminants of Emerging Concern in the Environment Investigation	The Emerging Contaminants Project at USGS conducts research to: develop analytical methods to measure chemicals and microorganisms in water, sediment and waste; determine the environmental occurrence of contaminants; characterize sources and pathways of release to the environment; define and quantify transport and fate of contaminants; identify ecological effects from exposure.
USGS NAWQA	National Water-Quality Assessment Program	The USGS implemented the National Water-Quality Assessment (NAWQA) Program in 1991 to develop long-term consistent and comparable information on streams, rivers, ground water, and aquatic systems in support of national, regional, State, and local information needs and decisions related to water-quality management and policy.
USDOD DENIX	Chemical and Material Risk Management Program	Develops policies, procedures and guidance for integrating lifecycle environment, safety and health considerations into the DoD acquisition process. This promotes more proactive chemical management and green procurement across the enterprise.

Summary Table of Vermont and Federal Programs, Acts and Databases

The table summarizes state and federal regulatory programs that are referenced in the report.

Abbreviated name (Who)	What	How
Public Information about Toxic and Hazardous Wastes and Substances, Emerging Contaminants in Vermont		
VDOH	Department of Health Environmental Public Health Tracking	VDOH has an environmental public health tracking network. The Tracking Network is a Web-based tool that provides health and environment data.
VDOH	Department of Health Chemicals of High Concern to Children List	The VDOH has programs to monitor and assess potential impacts of emerging contaminants on children's health.
VTANR	Natural Resources Atlas	The Natural Resources Atlas covers a wide array of programs in the Agency and provides geographic information about sites ANR manages, monitors, permits or regulates.
VTDEC WMD	Watershed Management Surface Water Management Strategy	The Vermont Surface Water Management Strategy includes sections on processes for identifying emerging contaminants (Appendix B).
VTDEC WMD	Watershed Management Vermont Integrated Watershed Information System	Surface water quality data is available on this database.
VTDEC WMD	Watershed Managment Waste Water Inventory	Waste Water systems database.
VTDEC WMPD	Agency of Natural Resources Environmental Research Tool	This database encompasses WMPD (Hazardous Sites, Brownfield Sites, Spills, UST, Hazardous Waste, Solid Waste, Salvage Yards and ASTs) and some WMD programs (Stormwater and Wetlands).
VTDEC AQCD	Air Quality and Climate Publications and Resources	The AQCD publish several reports regarding air quality in Vermont.
VTDEC GS	Geological Survey Geology and Health	Reports, maps, and data related to naturally-occurring arsenic, radioactivity, and other elements of concern in Vermont are posted on the web site.
Federal Informational Databases		
USDHHS ATSDR TSP	Agency for Toxic Substances and Disease Registry - Toxic Substances Portal	Access information about toxic substances and how they affect health.
USDHHS ATSDR NTSIP	Agency for Toxic Substances and Disease Registry - National Toxic Substance Incidents Program	The National Toxic Substance Incidents Program (NTSIP) gathers information about spills into a central place. Made up of three components: National Database, State Partners, Incident Investigatin.
USDHHS NTP	National Toxicology Program - Report on Carcinogens	Congressionally mandated, science based, public health doucument regarding carcinogens an their impact on public health.
EPA TRI Program	Toxics Release Inventory	Resource for learning about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities. Under EPCRA facilites that meet TRI reporting criteria mus submit TRI data to EPA and the states in which they are located annually. Persistent Bioaccumulative Toxic (PBT) Chemicals are of particular concern.

APPENDIX C

Requirements for Reporting of Use, Management, and Responses to Releases of Toxic or Hazardous Wastes and Substances

(Regulatory Program Summaries)

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OTHER STATE PROGRAMS

POISON PREVENTION PACKAGING ACT (PPPA)

Statutory Authority: Title 15 U.S.C. § 1471 –1477

Regulatory Authority: Title 16 CFR, chapter II, subchapter E, Parts 1700 – 1702

Administering Agencies/Departments:

The U.S. Consumer Product Safety Commission (CPSC) administers the PPPA. The Office of Compliance within the CPSC enforces rules and regulations of the PPPA, investigates hazardous products and violations of standards, seeks recalls for defective products, monitors compliance with various industry standards, and provides education to industry about mandatory standards.

Overview of Regulatory Program:

The primary purpose of the PPPA is to protect children from serious personal injury or serious illness resulting from handling, using, or ingesting hazardous household substances. The Act accomplishes this by requiring special packaging for household substances to prevent access and ingestion by children.

Summary of Chemicals/Substances Regulated:

The PPPA requires special packaging for household substances that are products or substances customarily produced or distributed for sale for consumption or use, or customarily stored by individuals in or about the household. They are either: hazardous substances as defined by the Federal Hazardous Substances Act; food, drugs, or cosmetics as defined by the Food, Drug, and Cosmetic Act; or substances intended for use as fuel when stored in a portable container and used in the heating, cooking, or refrigeration system of a house. The specific substances that fall under the authority of the PPPA include: aspirin; furniture polish; mouthwash; naproxen; lidocaine; methyl salicylate; controlled drugs; sodium and/or potassium hydroxide; turpentine; kindling and/or illuminating preparations; methanol; sulfuric acid; prescription drugs; ethylene glycol; glue removers; solvents for paint or other coating materials; fluoride; acetaminophen; and ibuprofen.

Products that are not subject to PPPA requirements are those that are not customarily used in/around the household, those which are specifically exempt from the law, bulk packages of drugs sold to pharmacies that will be repackaged by pharmacists before being dispensed, bulk chemicals sold to industry, and containers of 5 gallons or more. Additionally, there are exemptions to the requirements under the PPPA. One exemption recognizes concerns about accessibility of medication to the elderly and handicapped, and allows a manufacturer to package any over-the-counter household substance otherwise subject to a PPPA standard in a single-size package that bears conspicuous labeling stating that the package is for households without young children. Over 20 other substances are exempt, including powdered unflavored aspirin, oral contraceptives, hormone replacement therapy, powdered iron preparations, effervescent aspirins and acetaminophen, and sublingual nitroglycerin.

In addition to the various exemptions, regulated entities may apply for and obtain a petition for exemption of a household substance if the exemption meets certain justification requirements of the law.

The aim of the PPPA is to prevent risks posed to young children by ingesting or being exposed to substances already in production and on the market. To the extent that any substance already regulated

by the PPPA is an "emerging contaminant", the PPPA's provisions and requirements may serve to protect young children from risks posed by ingestion of the substance. Additionally, the CPSC could promulgate special packaging requirements to apply to new household substances under the PPPA that are or could contain an emerging contaminant.

Summary of Reporting Requirements:

There is no reporting required pursuant to the PPPA.

Summary of Management Requirements:

Under the PPPA, manufacturers of covered household substances are required to package the substance in "child-resistant" packaging (i.e., children under 5 years old would find the packaging significantly difficult to open). The packaging must function effectively for the life of the product and must not interfere with the proper functioning of the package. A package is considered to be "child-resistant" if, based on required testing, not more than 20% of 200 children tested can open the package, and at least if 90% of 100 adults tested can also open and close it.

The CPSC does not prescribe specific packaging designs, contents, quantity, or labeling, except the CPSC may prohibit packaging that is "unnecessarily attractive" to children. Failure to comply with packaging requirements or any applicable regulations is considered a misbranding under the Federal Drug and Cosmetic Act.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The PPPA has been successful in its purpose. Before the PPPA was enacted in 1970, poisonings by common household substances, including medicines, had long been considered by pediatricians to be the leading cause of injuries among children under 5 years old. After the PPPA and the implementation of standards to prevent poisonings, the CPSC reported that child-resistant packaging reduced the oral prescription medicine-related death rate by up to 1.4 deaths per million children under age 5 years. This represented a reduction in the rate of fatalities of up to 45% from levels that would have been projected in the absence of child-resistant packaging requirements, and equated to about 24 fewer child deaths annually. Gaps or limitations in the PPPA's success could include the multiple substances exempted from the law's requirements, and the ability for a manufacturers to seek certain waivers (for example, when a patient specifically requests non-compliant packaging). Additionally, federal preemption principles may apply once a household substance is regulated under the Act, which may prevent individual states from adopting stricter and more protective standards.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA/"SUPERFUND")

Statutory Authority: 42 U.S.C. § 9601 et seq.

Regulatory Authority: 40 C.F.R. Parts 300 – 374

Administering Agencies/Departments:

The Environmental Protection Agency (EPA) is authorized to implement CERCLA in all 50 states and U.S. territories. Superfund site identification, monitoring, and response activities in Vermont are coordinated through the Agency of Natural Resources (ANR).

Overview of Regulatory Program:

CERCLA, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Specifically, CERCLA:

- establishes requirements for closed and abandoned hazardous waste sites;
- establishes liability of persons responsible for releases of hazardous waste at these sites; and
- establishes a trust fund to provide for cleanup when no responsible party could be identified.
- authorizes two kinds of response actions to address contamination at a site:
    - short-term removals, where actions may be taken to address releases or threatened releases that require prompt response; and
    - long-term remedial response actions, which permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provide the guidelines and procedures for responding to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List (NPL); a list of the most serious sites identified by EPA for long-term cleanup.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986. SARA reflected EPA's experience in administering the complex Superfund program during its first six years and made several important changes and additions to the program. SARA stressed the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites; required consideration of other state and federal environmental laws and regulations; provided new enforcement and settlement authorities; encouraged greater citizen participation in site clean-up decisions, and increase the size of the Superfund trust.

Summary of Chemicals/Substances Regulated:

CERCLA requires the Agency for Toxic Substances and Disease Registry (ATSDR) and the EPA to prepare a list, in order of priority, of substances that are most commonly found at facilities on the National Priorities List (NPL) and which are determined to pose the most significant potential threat to human health due to their known or suspected toxicity and potential for human exposure at these NPL sites. CERCLA also requires this list to be revised periodically to reflect additional information on hazardous substances.

This substance priority list is revised and published on a 2-year basis, with a yearly informal review and revision. Each substance on the list is a candidate to become the subject of a toxicological profile prepared by ATSDR. The listing algorithm prioritizes substances based on frequency of occurrence at NPL sites, toxicity, and potential for human exposure to the substances found at NPL sites.

Petroleum is excluded from CERCLA however, refined product spills are covered by the Oil Pollution Prevention Act and the underground storage tank remedial provision, and crude oil spills and production activities are covered by the Oil Pollution Prevention Act.

Summary of Reporting Requirements:

Releases of CERCLA hazardous substances, in quantities equal to or greater than their reportable quantity[1], are subject to reporting to the National Response Center. Such releases are also subject to state and local reporting under section 304 of the Emergency Planning and Community Right-to-Know Act (EPCRA) (see program summary for the Emergency Planning and Community Right-to-Know; Vermont Hazardous Materials Compliance Tier II of this Appendix).

A consolidated list, referred to as the "List of Lists", includes chemicals referenced under five federal statutory provisions:

- EPCRA Section 302 Extremely Hazardous Substances (EHSs);
- CERCLA Hazardous Substances;
- CAA Section 112(r) List of Substances for Accidental Release Prevention;
- EPCRA Section 313 Toxic Chemicals (Toxic Release Inventory Chemicals); and
- RCRA Hazardous Wastes.

[1] CERCLA hazardous substances, and their reportable quantities, are listed in 40 CFR part 302, Table 302.4. Radionuclides listed under CERCLA are provided in a separate list, with reportable quantities in Curies. Chemical categories under CERCLA (including metal compound categories), which have "N.A." listed for the CAS Number, are also listed separately. For metals listed under CERCLA (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc), no reporting of releases of the solid form is required if the mean diameter of the pieces of the solid metal released is greater than 100 micrometers (0.004 inches).

Summary of Management Requirements:

CERCLA manages covered substances at sites that are listed on the NPL. Section 105(a)(8)(B) of CERCLA as amended, requires that the statutory criteria provided by the EPA Hazard Ranking System (HRS) be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. This list, which is Appendix B of the National Contingency Plan, is the NPL.

The identification of a site for the NPL is intended primarily to guide EPA in:

- determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site;
- identifying what CERCLA-financed remedial actions may be appropriate;
- notifying the public of sites EPA believes warrant further investigation; and
- serving notice to potentially responsible parties that EPA may initiate CERCLA-financed remedial action.

Inclusion of a site on the NPL does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. The NPL serves primarily informational purposes, identifying for the States and the public those sites or other releases that appear to warrant remedial actions.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Superfund was established to help finance the cleanup of releases of regulated substances, so technically it does not have regulatory authority to prevent them. Many of the sites listed on the NPL were from disposal of hazardous materials dating back in the 1800's to 1960's where wastes were buried underground, piped into streams and rivers, of just left behind when businesses closed which resulted in impacts to soils, groundwater, and surface water. Initially Superfund filled a major gap in environmental protection that existing laws in mid-1970's didn't address.

Nationally, over 850 of the nation's worst hazardous sites have been returned to safe and productive use. This reuse of previously contaminated land has had positive economic impacts on communities. Even residential property values near Superfund sites have increased after a Superfund site was cleanup and removed from the NPL.

Approximately 170 properties in Vermont have been assessed to determine NPL eligibility. Of these 14 sites added to the National Priorities List:

- Two sites (Tansitor and Darling sites) have been deleted from NPL following cleanup (cleanup goals were achieved);
- Seven sites have constructed remedies and are in long-term monitoring, and five sites are in various stages of investigation and final cleanup decisions; and
- Sixty-three properties remain in CERCLIS database, awaiting a final decision on listing.

OIL POLLUTION ACT

Statutory Authority: 33 U.S.C. 2701, *et seq*.

Regulatory Authority: 15 C.F.R. Part 990 – Natural Resource Damage Assessments

Administering Agencies/Departments:

Administering agencies include any official of the federal or state governments, of Indian tribes, and of foreign governments, designated as natural resource trustees pursuant to 33 U.S.C. § 2706(b).

Overview of Regulatory Program:

The goal of the Oil Pollution Act (OPA) is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving a discharge or substantial threat of a discharge of oil. To fulfill this goal, a natural resource damage assessment is conducted by designated trustees to develop a plan for the restoration of injured natural resources and services. Restoration actions are implemented, monitored and corrective action can be taken to ensure the success of the restoration alternatives.

Summary of Chemicals/Substances Regulated:

OPA does not regulate specific chemicals or substances.

Summary of Reporting Requirements:

OPA does not have any specific reporting requirements, but does require that affected entities have contingency plans in place in the event of an oil discharge.

Summary of Management Requirements:

OPA dictates how trustees make the public whole following the discharge of oil into the environment that results in injury to natural resources and services.

A trust fund created under OPA, financed by a tax on oil, is available to clean up oil spills when the responsible party is incapable or unwilling to do so.

Entities that store or transport oil are required to have a plan for responding to a discharge of oil.

A National Contingency Plan for responding to oil discharges is required to be maintained and updated.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

OPA is effective in preventing oil discharges from affected entities and ensuring that trustees and affected entities are prepared to respond appropriately in the event of an oil discharge. OPA supersedes the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) with regard to oil discharges covered by OPA. For natural resource damages resulting from a discharge or release of a mixture of oil and hazardous substances, trustees must use CERCLA regulations to obtain a rebuttable presumption. The Oil Spill Liability Trust Fund, which is funded by a tax on oil, is an effective way to ensure that the public is made whole following injury to natural resources from an oil discharge when a responsible party is unable or unwilling to pay damages. The two most frequent federal trustees under

OPA, the Department of the Interior and the National Oceanic and Atmospheric Administration, manage large OPA caseloads, and are historically ready and willing to work cooperatively with potential state trustees to address injury to natural resources. Because OPA requires the development and maintenance of contingency plans for affected entities, as well as national and regional contingency plans, response to oil discharges are typically timely and well organized.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

Statutory Authority: 15 U.S.C. § 2601 et seq. (1976)

Regulatory Authority: 40 CFR 195 (radon); 40 CFR 700-766 (general)

Administering Agencies/Departments:

The Environmental Protection Agency's Office of Pollution Prevention and Toxics (OPPT) manages programs under the Toxic Substances Control Act. Individual states can be authorized by EPA to operate their own programs for some portions of the TSCA law in lieu of EPA administration. Vermont is not currently an authorized state.

Overview of Regulatory Program:

TSCA was enacted with a purpose to protect the public from unreasonable risks of injury to health or the environment posed by the manufacture, use, and sale of chemicals. TSCA provides EPA with authority to require entities to report, maintain records, and conduct testing, and to place restrictions on/regarding the use of chemical substances and chemical mixtures. Specifically, TSCA authorizes EPA to:

- Gather basic information on chemical risks from chemical manufacturers and processors;
- Require companies to test chemicals and chemical mixtures for toxic effects;
- Review most new chemicals prior to manufacture of those chemicals; and
- Prevent unreasonable risks by regulating chemicals and mixtures, including hazard warning labels and bans on manufacturing, processing, and/or distribution in commerce, and use of certain chemicals or mixtures.

TSCA regulates "existing" and "new" chemicals; specific requirements are required for each category. Existing chemicals are those chemicals that are included on the TSCA Chemical Substance Inventory (the "Inventory"), while "new" chemicals are (for purposes of TSCA regulation) a chemical that is not on the TSCA Inventory. Manufacturers are required to report to EPA information on existing chemical manufacturing and processing, adverse health effects, safety studies, and substantial risks posed by chemicals. Additionally, any significant new use of existing chemicals is required to be reported.

Prior to amendments to the law in 2016, EPA could require manufacturers to test certain existing chemicals, but in each case, EPA must first have made formal findings based on the potential for the chemical to present an "unreasonable risk" to human health and the environment. These findings were extremely difficult to make as they were dependent on the type of data that EPA could not otherwise access or cause to be generated under the law without first making the findings. As a result, only about 250 of the more than 60,000 existing chemicals have been tested by the EPA as of 2015. Sixty of those were tested upon receiving voluntary consent by the manufacturer. Additionally, the Inventory did not include the approximately 62,000 chemicals that were in commerce at the time of TSCA's passage; those chemicals were deemed "safe" and subsequently grandfathered as exempt from the law's requirements.

Companies are required to notify EPA of their intent to manufacture a new chemical. Prior to the amendments in 2016, EPA had 90 days within receiving notice of intent to manufacture to take action to restrict manufacture of the chemical if EPA found that the chemical presented an unreasonable risk, was reasonably anticipated to enter the environment in substantial quantities, or if it could cause significant or substantial human exposure. However, with no requirements for toxicity testing or submission of safety information on the new chemical upon submission of the notice, there was little ability for EPA to actually make findings to support a restriction or delay the manufacturing of new chemicals.

Lautenberg Amendments of 2016

TSCA has been amended several times since its passage in 1976. Most significantly, the Frank R. Lautenberg Chemical Safety for the 21st Century Act was signed into law on June 22, 2016. This Act (referred to as the "Lautenberg Amendments") amended TSCA in several key ways, purporting to make the law substantially more effective in achieving its original goals of requiring evaluation of risks posed by chemicals and of protecting the public and the environment from those risks.

Specifically, the amendments created mandatory requirements for EPA to evaluate and test already-existing chemicals with clear and enforceable deadlines, including the 62,000 chemicals that were originally grandfathered from TSCA. As amended, EPA must now make an affirmative finding on the safety of a new chemical before the chemical is allowed in commerce. The law was also amended to incorporate a risk-based safety standard, instead of a standard that focused on other factors, such as costs and other non-risk factors. When unreasonable risks are identified based on the required evaluation of a chemical, TSCA now requires that EPA take final risk management action on that chemical within two to four years. Additionally, the law requires increased public transparency for chemical use information, and provides a consistent source of funding for EPA to carry out the responsibilities under the new requirements.

One of the more controversial parts of the Lautenberg Amendments establishes that once EPA takes certain actions to evaluate a chemical substance for regulation (i.e., publishes the scope of a risk evaluation of a chemical), such action can temporarily preempt new state prohibitions or restrictions on that chemical substance until EPA publishes the evaluation or reaches a statutory deadline for publication of the evaluation. Additionally, state action can be permanently preempted when EPA makes either a determination to regulate a chemical substance due to any unreasonable risk posed, or determines that a chemical substance does not pose an unreasonable risk.

Lastly, the Lautenberg Amendments also establish new requirements for certain types of claims made by companies that chemical substances or mixtures are confidential or trade secret. EPA must now review and make determination on all claims, including all new claims and all past claims.

Summary of Chemicals/Substances Regulated:

TSCA regulates chemical substances and chemical mixtures. "Chemical substance" is defined by the law as "any organic or inorganic substance of a particular molecular identity, including any combination of such substances occurring in whole or in part as a result of a chemical reaction or occurring in nature; and any element or uncombined radical." Eight substances are specifically exempt from the definition

of “chemical substance” and are exempt from regulation under the law: pesticides; tobacco; source, special nuclear, or byproduct materials; firearms and ammunition; food; food additives; drugs; and cosmetics. A chemical “mixture” includes “any combination of two or more chemical substances if the combination does not occur in nature and is not, in whole or in part, the result of a chemical reaction…”.

As described above, requirements of the law depend on whether the chemical substance or mixture is “existing” or “new”. Currently, there are approximately 85,000 existing chemicals on the TSCA Inventory for EPA evaluation.

The law’s requirements apply to contaminants of emerging concern insofar as a manufacturer intends on manufacturing or importing a new chemical that has not been extensively evaluated, and/or will apply to existing chemicals on the Inventory have not yet been comprehensively evaluated.

Summary of Reporting Requirements:

As amended, TSCA retains the requirement for manufacturers to notify EPA of the manufacturer’s intention to manufacture a new chemical. There are also notification requirements for any person who exports or intends to export a chemical substance or mixture.

The Chemical Data Reporting Rule, which was issued under TSCA, requires manufacturers, including importers, to report information to the EPA regarding the chemicals they manufacture domestically or import into the U.S.A. Information required to be reported include exposure-related information on the types, quantities, and uses of chemical substances. This information is collected every four years from manufacturers and importers when production volumes for the chemical are 25,0000 pounds or greater for the specific reporting year. This data is used to help assess the potential human health and environmental effects of these chemicals, to support risk screening, assessment, priority setting and management activities.

Additionally, TSCA created a new “inventory rule”, which requires industry to report chemicals manufactured and/or processed in the previous 10 years. Results will be used to designate active and inactive chemicals on the Inventory.

EPA makes the non-confidential business information it receives about chemicals publicly-available through several databases, including the Chemical Data Access Tool, eDoc tool, TSCA Test Submission (TS) tool, High Production Volume Information System (HPVIS) tool, E-Docs declassified documents tools, HC tool (EPA’s characterization of screening-level hazard/toxicity data submitted or otherwise available to EPA on high production volume chemicals).

Summary of Management Requirements:

EPA’s management of chemicals under TSCA (i.e., bans, restriction, and other action regarding certain chemicals) relies upon EPA’s determination of the risks posed by a chemical. This determination is based on information and data submitted to EPA on regulated chemicals.

As amended, TSCA requires EPA to evaluate all existing chemical substances. EPA is required to assess and prioritize these existing chemicals as either “high” or “low” priority substances based on the

potential risks of injury to health or the environment due to potential hazard, route of exposure, and susceptibility of vulnerable populations to the chemical. For a chemical identified as high priority, EPA must (within a specified period) conduct an evaluation to determine the chemical's actual safety and specifically whether the chemical poses an "unreasonable risk". This safety evaluation must be conducted using a risk-based safety standard, which includes consideration of risks to susceptible and other vulnerable subpopulations, and which excludes consideration of costs and non-risk factors. When unreasonable risks posed by high priority chemicals are identified, EPA is required to take final risk management action within two years (unless an extension is required), and such actions are to take effect no later than five years after being put into place.

TSCA also requires fast-tracking of persistent, bioaccumulative, and toxic (PBT) chemicals that are identified as high priority substances, and also permits EPA to obtain testing information from manufacturers for prioritizing or conducting risk evaluations on existing chemicals.

The Lautenberg Amendments require EPA to initiate at least 10 ongoing risk evaluations within the first 180 days of the Act's passage. Within three and a half years after passage, EPA is required to have at least 20 ongoing risk evaluations. As for new chemicals, the Lautenberg Amendments revised TSCA to require an affirmative finding by EPA on the safety of any new chemical or significant use of an existing chemical prior to the chemical being used.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

TSCA is not designed to prevent releases of toxic substances, hazardous wastes, or hazardous material. Rather, as amended by the Lautenberg Amendments of 2016, TSCA is more effective at protecting human health and the environment from risks posed by chemicals than when the law originally became effective. Among the Lautenberg Amendment's provisions, EPA now has legal authorities to require testing of chemicals before they enter the market, to consider the most vulnerable populations (such as children and pregnant women) when evaluating and determining acceptable risks), to collect important safety-related information on chemicals, and to regulate and/or ban chemicals that are deemed to pose an unacceptable risk.

However, once EPA takes certain actions to evaluate and regulate a chemical due to risks, states may be preempted from regulating the same chemicals for the same uses in a more protective manner. Additionally, even though the 62,000 originally-grandfathered chemicals are on the hook for evaluation by EPA, there are still major classes of chemicals and toxic substances that are exempt from the definition of "chemical substances" and thus from TSCA's regulation.

The 2016 amendment creates new fees for both new and existing chemicals to defray a portion of costs of implementing the program, going directly to EPA and not the treasury. However, with ambitious timelines to identify priority chemicals for evaluation, for risk-based evaluation of chemicals, and for taking major action to regulate chemicals that pose unreasonable risks, it is yet to be seen whether current levels of funding are adequate to support this work.

HAZARDOUS SUBSTANCES ACT

Statutory Authority: 15 U.S.C. § 1261 et seq.

Regulatory Authority: 16 C.F.R. Part 1500 et seq.

Administering Agencies/Departments:

The U.S. Consumer Product Safety Commission (CPSC) administers the Hazardous Substances Act.

Overview of Regulatory Program:

The FHSA was enacted in 1960, and was substantially revised in 1972. The law requires precautionary labeling on the immediate container of a hazardous household products to help consumers safely store and use those products and to give them information about immediate first aid and other steps to take if an accident happens. The FHSA allows the CPSC to ban certain products that are so dangerous or the nature of the hazard is such that the labeling act requirements are not adequate to protect consumers.

Summary of Chemicals/Substances Regulated:

The FHSA requires hazardous household products ("hazardous substances") to bear labeling that serves to alert consumers to the potential hazards that those products present, and provides instructions for protection from harm from those hazards. A "hazardous substance" means that the product must be toxic, corrosive, flammable or combustible, an irritant, or a strong sensitizer, or it must generate pressure through decomposition, heat, or other means. The product must also have the potential to cause substantial personal injury or substantial illness during or as a result of any customary or reasonably foreseeable handling or use, including reasonably foreseeable ingestion by children.

The FHSA applies to products that, during reasonably foreseeable purchase, storage, or use, may be brought into or around a place where people live (household). Products that are used or stored in a garage, shed, carport, or other building that is a part of a household are also covered.

Summary of Reporting Requirements:

The FHSA does not contain any reporting requirements.

Summary of Management Requirements:

FHSA regulations specify the tests a manufacturer must perform to evaluate a product for the listed set of hazard. There are no formal guidelines under FHSA or its regulations to evaluate exposures to a product that contains a hazardous substance or the risk of injury from exposure to such product. However, the FHSA advises that manufacturers consider the following factors: (1) how the contents and form of the product might cause an injury; (2) the product's intended handling, use, and storage, and (3) any accidents that might foreseeably happen during handling, use, storage that could harm the purchaser, user, or others, including young children who might get into the package of the product.

Where a precautionary label is required on a product, the label must appear on the immediate package of a hazardous product, and any outer wrapping or container that might cover up the label on the package. The label must be conspicuous and must contain the following information: (1) the name and business address of the manufacturer, packer, distributor, or seller; (2) the common or usual or chemical name of each hazardous ingredient; (3) the signal word "Danger" for products that are corrosive, extremely flammable, or highly toxic; (4) the signal word "Caution" or "Warning" for all other hazardous products; (5) an affirmative statement of the principal hazard(s) that the product presents; (6) precautionary statements telling users what they must do or what actions they must avoid to protect themselves; (7) where appropriate, instructions for first aid treatment to perform in the event that the product injures someone; (8) the word "Poison" for a product that is highly toxic, in addition to the signal word "Danger"; (9) if a product requires special care in handling or storage, instructions for consumers to follow to protect themselves; and (10) the statement "Keep out of the reach of children".

In addition to labeling requirements for products containing a hazardous substance, the CPSC has banned other hazardous substances due to the determination that the cautionary labeling is not adequate to protect the public from hazards posed by the substance. The CPSC has banned several products, including:

- Extremely flammable water repellents for use on masonry walls and floors inside homes;
- Carbon tetrachloride and mixtures containing it;
- Liquid drain cleaners that contain 10% or more by weight of sodium or potassium hydroxide and that are not packaged in child-resistant packaging;
- General-use garments containing asbestos;
- Self-pressurized products that contain vinyl chloride monomer as an ingredient or in the propellant;
- Products containing soluble cyanide salts;
- Paint and other surface coatings containing more than 0.06& lead, and furniture, toys, and other articles intended for use by children that are coated with such paint;
- Certain extremely flammable contact adhesives.

The FHSA's requirements may apply to contaminants of emerging concern if the contaminant is or has properties which cause it to be classified as a "hazardous substance."

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The FHSA is aimed at protecting mostly children from the hazards posed by products that contain hazardous substances through requiring conspicuous, informational labeling to inform consumers about associated hazards and risks posed by the product. In addition to the strong labeling requirements, the CPSC has been given broad authority to ban any product from commerce if it contains a hazardous substance that has risks that labeling cannot adequately protect against. The CPSC indeed has banned several products based on this factor. The FHSA does not provide formal guidance for manufacturers in

identifying potential exposures and risks from exposures from a hazardous substance in a product, which could result in variations of this assessment throughout the industry. Lastly, the law provides for fairly serious penalties in the case of a violation of the law's provisions: violators face criminal prosecution, hefty fines, and imprisonment.

VERMONT AIR POLLUTION CONTROL PROGRAMS

Control of Hazardous Air Contaminants
Registration of Air Contaminant Sources

Statutory Authority: 10 V.S.A. chapter 23, § 555; 10 V.S.A. chapter 23, § 575

Regulatory Authority: 40 C.F.R Part 51 – Subpart A (Air Emissions Reporting Requirements); Vermont Air Pollution Control Regulations, §§ 5-261, 5-801–5-808

Administering Agencies/Departments:

The Air Quality and Climate Division (AQCD) of the Vermont Department of Environmental Conservation (DEC) administers the Control of Hazardous Air Contaminants and Registration of Air Contaminant Sources programs for the State.

Overview of Regulatory Program:

Section 555c of Title 10, Chapter 23 and section 2822(j)(B) of Title 3, Chapter 51 require that any person operating or responsible for the operation of an air contaminant source emitting more than five tons of air contaminants per year shall register the source annually and pay the designated fees. Additionally, sources must report emissions of Hazardous Air Contaminants (HACs) listed in Appendices B & C of the Air Pollution Control Regulations.

Vermont Air Pollution Control Regulation § 5-261 states that "No person shall discharge, or cause or allow the discharge of, emissions of any hazardous air contaminant, except in conformity with the provisions of this section. Any stationary source whose actual emission rate of a contaminant is below the Action Level for such contaminant specified in Appendix C of these regulations shall not be subject to this section for that contaminant. In the case of a stationary source with multiple process units, the actual emissions of a contaminant from the entire stationary source shall be compared to the appropriate Action Level to determine the applicability of this section. If the increase in emissions from a modification of such a stationary source, in conjunction with all other emissions from the source, would result in an exceedance of an Action Level, the modification shall be subject to this section." For those sources having HAC emissions rates exceeding the Action Level, the regulations state "For each hazardous air contaminant listed in Appendix B herein and emitted by a stationary source, the source shall apply control technology, production processes or other techniques adequate to achieve the hazardous most stringent emission rate (HMSER)."

Summary of Chemicals/Substances Regulated:

The chemicals subject to regulation under these programs are listed in Appendices B & C of the Vermont Air Pollution Control Regulations.

Summary of Reporting Requirements:

Vermont Air Pollution Control Regulation 5-802 requires "Each operator of a source which emits more than five tons of any and all air contaminants per year shall register the source with the Secretary, and

shall renew such registration annually." The reported information is used for tracking annual emissions and emissions trends, and for estimating applicable fees, and is maintained in a relational database. The information and historical files are available for the public to review at the Air Quality and Climate Division offices in Montpelier.

Summary of Management Requirements:

The toxics management requirements under § 5-261 are established on a case-by-case basis for each facility subject to the regulation based on the best emission controls achievable for the specific facility as determined by the Secretary. The management practices may include application of pollution control equipment, production processes or techniques, equipment design, work practices, chemical substitution, or innovative pollution control techniques.

The toxics management requirements under § 5-801 entail maintaining detailed records of the annual purchases and/or usages for each regulated pollutant and the calculation of resultant actual emissions to the ambient air of each pollutant on an annual basis. The emission calculation procedures may include mass balance, emission factors and engineering calculations.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The categorization of Hazardous Air Contaminants (HACs) in Appendix C, established Hazardous Ambient Air Standards and Action Levels, and Registration fee structure set forth in the Air Pollution Control Regulations serve as regulatory and financial disincentives to guide sources away from use of chemical products that result in emissions of Hazardous Air Contaminants having relatively greater toxicity. Sources that do emit HACs of relatively higher toxicity are subject to paying higher fees, and achieving lower emissions rates. Historical data show that progress has been made in reducing the overall mass of HAC emissions, and in shifting towards less toxic alternatives.

VERMONT AIR POLLUTION CONTROL PROGRAMS

National Emission Standards for Hazardous Air Pollutants

Statutory Authority: Federal Clean Air Act (1990), Title 1, Section 112 (U.S.C. § 7412)

Regulatory Authority: 40 C.F.R Part 63

Administering Agencies/Departments:

The Air Quality and Climate Division (AQCD) of the Vermont Department of Environmental Conservation (DEC) has been authorized to administer the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations in lieu of the U.S. Environmental Protection Agency (EPA).

Overview of Regulatory Program:

The EPA determines the list of hazardous air pollutants (HAPs) to be regulated (currently 187), identifies the source categories to be regulated that emit those pollutants, and develops the regulations to control those emissions. The AQCD then takes delegation of applicable and administers them through the state air permitting programs.

The EPA was required to develop regulations to control emissions of HAPs from all source categories that had the potential to emit greater than 10 tons per year of any single HAP or 25 tons per year of all HAPs combined. These sources are referred to as major HAP sources. The EPA was also required to develop regulations for smaller sources that represented 90% of the emissions of 30 HAPs determined to present the greatest threat to human health. These sources are referred to as area sources. The EPA was then required to establish emission standards for these source categories that reflect the emission levels achieved by the best controlled sources. Such standards are required to be periodically reviewed and revised as appropriate. The EPA is also obligated to evaluate the residual risk of the remaining emissions and develop further regulations to control emissions as may be appropriate to ensure protection of public health.

Summary of Chemicals/Substances Regulated:

The list of 187 HAPs was set in the Clean Air Act of 1990. The EPA is required to periodically review and revise the list as appropriate to add pollutants that may present a threat of adverse human health effects or adverse environmental effects. No new HAPs have been added since the inception of the list in the 1990 CAA.

Summary of Reporting Requirements:

The regulations for each source category typically contains emission monitoring and reporting requirements. Such monitoring and emission reports are submitted to EPA and the delegated state.

Summary of Management Requirements:

There are approximately 150 source categories for which an emission regulation has been developed. Each regulation is unique to the source category being regulated and may include requirements for handling and management of the HAP as well as emission control measures.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

These regulations have been effective at reducing HAP emissions from the largest source emission categories. Many of the regulated source categories do not exist in the State of Vermont. The program has not been effective at identifying new and contaminants of emerging concern (CECs) and was not devised to address most smaller emission sources of less common pollutants.

VERMONT CLEAN WATER ACT PROGRAMS

National Point Source Discharge Elimination, Concentrated Animal Feeding Operations, and Other Programs

Statutory Authority: Clean Water Act, Section 402(b); 40 C.F.R. Part 123
10 V.S.A. chapter 47, § 1263

Regulatory Authority: 40 C.F.R. Part 122; 10 V.S.A. § 1263

Administering Agencies/Departments:

The State of Vermont has been authorized to administer the federal National Pollutant Discharge Elimination System (NPDES) program in lieu of the Environmental Protection Agency (EPA). The Watershed Management Division within the Department of Environmental Conservation (DEC) administers the NPDES programs, which include wastewater discharges directly to surface waters, industrial discharges to municipal sewage collection systems, the stormwater programs, and the Concentrated Animal Feeding Operations (CAFO) program.

Overview of Regulatory Program(s):

As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating "point sources" that discharge pollutants into waters of the United States or point source industries that discharge pollutants into a municipal sewage collection system. Point sources are discrete conveyances such as pipes or man-made ditches.

Pollutants can enter water via a variety of pathways including agricultural, domestic and industrial sources. For regulatory purposes, these sources generally are categorized as either point sources or nonpoint sources. The term point source is defined in CWA section 502(14) and § 122.2 to include any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. Point source discharges include discharges from publicly owned treatment works (POTWs), industrial process wastewater discharges either directly to surface waters or to municipal collection systems, runoff conveyed through a storm sewer system, and discharges from concentrated animal feeding operations (CAFOs), among others.

Direct Discharges; industrial and municipal. All municipal, industrial and commercial facilities that discharge wastewater directly from a point source (such as a pipe, ditch or channel) into a receiving waterbody (lake, river, or ocean) are required to obtain an NPDES permit. Facilities that discharge to a wastewater treatment facility's collection system, which in turn discharges into the receiving waterbody, are controlled by the NPDES national pretreatment program.

The state or federal agencies that issue permits determine the volume of effluent that can be discharged from a given facility and set limits in the permit to ensure that water quality is not compromised. NPDES permits are effective for a maximum period of five years, and may be renewed. The permits are divided into two categories: municipal and industrial. Each category is then subdivided into major

(large dischargers) and minor (small dischargers). Some of the permits cover single facilities while others (general permits), cover all the facilities of a certain type in a given state.

Wastewater discharges from industrial and commercial sources may contain pollutants at levels that could affect the quality of receiving waters or interfere with publicly owned treatment works (POTWs) that receive those discharges. The NPDES permitting program establishes discharge limits and conditions for industrial and commercial sources with specific limitations based on the type of facility/activity generating the discharge.

The collection and treatment of domestic sewage and wastewater (municipal discharges) is vital to public health and clean water. It is among the most important factors responsible for the general level of good health enjoyed in the United States. Sewers collect sewage and wastewater from homes, businesses, and industries and deliver it to wastewater treatment facilities before it is discharged to water bodies or land, or reused.

Pretreatment Program. The Wastewater Management Program issues permits under the Federal Pretreatment Permit Program for certain industrial and commercial discharges to municipal wastewater treatment facilities. The program is designed to protect POTWs infrastructure, and reduce conventional and toxic pollutant levels discharged by industries and other nondomestic wastewater sources into municipal sewer systems and into the environment. Vermont is one of only five states where the pretreatment program is administered at the state level, whereas in all other delegated states that authority is further delegated by the state regulatory authority down to the municipal level. Although the overall administration of Vermont's program is conducted by DEC, there are a number of (the larger) municipalities that have implemented their own pretreatment programs, but those do not preempt the state's authority.

General Permits for Discharges from Petroleum Related Remediation Activities. This permit covers discharges from petroleum related remediation activities to all Class B waters within the State of Vermont. Petroleum related remediation activities include discharges resulting from corrective actions involving above ground or underground storage tanks used to store gasoline, diesel fuel, kerosene, jet fuel, or heating oil, or the transportation of these fuels.

The Wastewater Management Program issues two types of general permits, (1) for direct discharges to surface waters (NPDES) and (2) for discharges from petroleum related remediation activities into municipal wastewater treatment facilities. Applicants who need coverage under either general permit must apply on a special Notice of Intent (NOI) application and must satisfy a 10-day public comment requirement.

Combined Sewer System. A combined sewer system (CSS) collects rainwater runoff, domestic sewage, and industrial wastewater into one pipe. Under normal conditions, it transports all of the wastewater it collects to a sewage treatment plant for treatment, then discharges to a water body. The volume of wastewater can sometimes exceed the capacity of the CSS or treatment plant (e.g., during heavy rainfall events or snowmelt). When this occurs, untreated stormwater and wastewater, discharges directly to

nearby streams, rivers, and other water bodies. Combined sewer overflows (CSOs) contain untreated or partially treated human and industrial waste, toxic materials, and debris as well as stormwater.

EPA's CSO control policy is a national framework for controlling CSOs through the NPDES permitting program. The CSO control policy also defines expectations for regulated communities, state water quality standards (WQS) authorities, and NPDES authorities. In 2016, Vermont replaced its 1990 CSO Control Policy with a new regulation, the Combined Sewer Overflow Rule. The purpose of the Rule is to protect public health and the environment by ensuring that all remaining CSOs in the State are brought into compliance with the requirements of state and federal law, including the Vermont Water Quality Standards (VWQS). The Rule codifies, updates, and clarifies the technology-based and water quality-based requirements applicable to the CSOs within the State, consistent with state and federal law. Further, the Rule includes the processes through which the Agency of Natural Resources (Agency) will require municipalities to bring CSOs into compliance with the VWQS.

Stormwater Permit Program. The NPDES Stormwater Program, in place since 1990, regulates discharges from municipal separate storm sewer systems (MS4s), construction activities, industrial activities, municipal activities, and those activities designated by EPA due to water quality impacts. The Watershed Management Division implements the program consisting of two major components: (1) the issuance of stormwater permits pursuant to state law for the postconstruction management of stormwater runoff pursuant to 10 V.S.A. §§1264 and 1264a ; and (2) the issuance of permits pursuant to the EPA-delegated federal NPDES program for construction site runoff, stormwater associated with industrial activities and stormwater discharges from municipal stormwater systems pursuant to 10 V.S.A. §§1258 and 1264. The Division may also issue NPDES stormwater permits for other point source stormwater discharges designated by the Secretary pursuant to 40 C.F.R. 122.26(a)(9)(i)(D) and stormwater discharges designated by the Secretary as requiring a NDPES permit pursuant to 40 C.F.R 122.26(a)(9)(i)(C) to implement a TMDL.

The Division uses a combination of individual and general permits to authorize stormwater discharges. There are currently five distinct Federal and State permits which regulate the runoff of stormwater. A permit could be required for construction of impervious surfaces (roads, buildings, parking lots, etc.), for restoration of impaired waters in a few select watersheds, for stormwater runoff from certain industrial activities, for municipal management of stormwater in certain large municipalities, and for construction site runoff.

Pesticide Permitting. In Vermont, the Agency of Agriculture regulates the majority of pesticide usage in agricultural, residential, and transportation settings. However, the NPDES permitting program does regulate discharges from pesticide applications consistent with section 402 of the Clean Water Act (CWA). Point source discharges of biological pesticides and chemical pesticides that introduce a pesticide residue into waters of the U.S. are required to comply with NPDES requirements. EPA and the states issue Pesticide General Permits (PGPs) to offer coverage for pesticide operators, Vermont DEC-WSMD administers the NPDES PGP. Activities not eligible for coverage under the PGP may be eligible for coverage under an individual permit.

Summary of Chemical /Substances Regulated:

The term "pollutant" is defined in CWA § 502(6) and § 122.2. The statute defines pollutant very broadly and includes any type of industrial, municipal, or agricultural waste (including heat) discharged into water. For regulatory purposes, pollutants are grouped into three categories under the NPDES program, conventional, toxic, and nonconventional:

- Conventional pollutants are those defined in CWA § 304(a)(4) and § 401.16 (BOD5, TSS, fecal coliform, pH, and oil and grease).
- Toxic (priority) pollutants are those defined in CWA § 307(a)(1) (and listed in § 401.15 and Appendix A of Part 423) and include 126 metals and manmade organic compounds (see Exhibit C-1 in Appendix C of this document).
- Nonconventional pollutants are those that do not fall under either of the above categories (conventional or toxic pollutants) and include parameters such as chlorine, ammonia, nitrogen, phosphorus, chemical oxygen demand (COD), and whole effluent toxicity (WET).

The Clean Water Act requires EPA to develop criteria for ambient water quality that accurately reflect the latest scientific knowledge on the impacts of pollutants on human health and the environment. These water quality criteria for the protection of aquatic life and human health in surface water include approximately 150 pollutants, which include the Toxic Priority Pollutants. These criteria are published pursuant to Section 304(a) of the Clean Water Act (CWA).

The Vermont Water Quality Standards present the most up-to-date listing of contaminants regulated and reflect the EPA National Recommended Water Quality Criteria. Where numeric criteria for a toxic substance (i.e. emerging contaminant) are not established, the Secretary may establish such criteria based on the procedures set forth in the Vermont Toxic Discharge Control Strategy (1994). NPDES is designed to control toxic discharges, implement a water quality standards program, and restore waters to "fishable and swimmable" conditions. A point source that discharges pollutants to waters of the United States must do so under the terms and conditions of an NPDES permit. In setting these terms and conditions, EPA and the States have integrated their control of toxic pollutants through combined use of chemical-specific controls, whole effluent toxicity (WET) controls, and biological criteria/bioassessments and bioassays. The three approaches, which are further described in the Technical Support Document for Water Quality-based Toxics Control (USEPA 1991a) provide the guidance for assuring that a discharge is not toxic.

Whole effluent toxicity (WET) testing measures the aggregate toxic effect of an effluent measured directly by an aquatic toxicity test and is used to screen and assess the toxicity of permitted discharges. Biological criteria are also used to identify impacts from toxicity by use of biological criteria for both benthic invertebrates and fish communities.

The Water Quality Standards also contain a narrative standard that states that "no toxics in toxics amounts."

The Toxics Discharge Control Strategy (1994) provides guidance for the implementation of narrative and numeric water quality standards as cited above, and describes procedures for determining appropriate toxic pollutant criteria when necessary to protect aquatic biota and human health. Where narrative criteria are adopted by a state, the state is required to identify how it intends to regulate toxic discharges.

Section 3-01(B)(10) of Vermont's water quality standards contains narrative criteria designed to protect the State's waters from toxic discharges. Appendix C of the Standards contain numeric criteria. The narrative criteria are as follows:

> Where necessary to protect an existing or reasonably anticipated beneficial use, the waters of the State shall be managed to prevent the discharge of toxic substances in concentrations, quantities or combinations that based on the beneficial values and uses associated with the classification of the receiving waters, exceed:
>
> (1) for toxic substances that are carcinogenic, a maximum individual lifetime risk to human health greater than 10^{-6}, or
>
> (2) for toxic substances that are non-carcinogenic, a maximum individual lifetime risk of no adverse effect to human health, or
>
> (3) acute or chronic toxicity to aquatic biota, fish, or wildlife.
>
> Sections 3-01(B)(10)(b & c) establish numeric ambient criteria for the protection of aquatic biota and human health. These sections essentially adopt those ambient criteria published by the USEPA pursuant to Section 304(a)(1) of the Clean Water Act.

Summary of Reporting Requirements:

Discharge Monitoring Reports (DMRs) for conventional and toxic pollutants. The Clean Water Act requires all point source dischargers to obtain a NPDES permit and report compliance with NPDES permit limits via monthly DMRs submitted to the permitting authority. The permitting authority then enters those data into EPA's Integrated Compliance Information System (ICIS) database. The information entered into the ICIS database is made available to the public through EPA's Enforcement and Compliance History Online (ECHO) databased and through EPA's Envirofacts database.

Facilities report pollutant discharge monitoring data in their DMR as mass-based quantities (e.g., pounds per day) and/or concentrations (e.g., mg/L). Although other pollutants may be discharged, ICIS-NPDES contain data only for the parameters identified in the facility's NPDES permit.

Toxic Characteristic Leaching Procedure (TCLP). Facilities which generate or prepare sewage sludge must indicate the results of the TCLP test on the sludge.

Toxics Release Inventory (TRI). Required by the Emergency Planning and Community Right-to-Know Act (EPCRA), TRI tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. The current TRI toxic chemical list contains 595 individually-listed chemicals and 31 chemical categories (including four categories containing 68 specifically-listed

chemicals). Facilities in different industry sectors must report data annually to EPA. The data includes how much of each chemical is released to the environment and/or managed through recycling, energy recovery and treatment. A "release" of a chemical means that it is emitted to the air or water, or placed in some type of land disposal.

Using both Toxics Release Inventory (TRI) and Discharge Monitoring Report (DMR) data provides a more complete understanding of toxic chemical releases to surface waters. This TRI data and the DMR data allows loadings to be calculated independently; presents pollutant loadings as pounds per year and as toxic-weighted pounds (TWPE) per year, and ranks dischargers, industries, and watershed based on pollutant mass and toxicity.

Information required to be reported through the program as identified in this section is made available to the public through the following methods:

Toxics Release Inventory (TRI). TRI tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. Information reported by facilities regarding management and releases of chemicals is made available to communities, government agencies, companies, and other entities through an EPA-managed database.

Permit Compliance System (PCS) and Integrated Compliance Information System (ICIS). Information from these databases is available through ECHO and Envirofacts, both administered by the EPA. The systems provide information on companies which have been issued permits to discharge wastewater into rivers. The public can review information on when a permit was issued and expires, how much the company is permitted to discharge, and the actual monitoring data showing what the company has discharged. The PCS-ICIS Search allows public retrieval of preselected data (facility name, geographic location, facility industrial classification, and specific chemicals) from the PCS and ICIS databases in Envirofacts (administered by the EPA).

Emergency Planning and Community Right-to-Know Act (EPCRA). The programs under which EPA collects TRI and DMR data are the Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES), respectively. EPCRA was created to help communities plan for emergencies involving hazardous substances. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at facilities, their uses, and releases to the environment.

Vermont Integrated Watershed Information System (IWIS). The VTDEC-Watershed Management Division maintains an online data portal for water quality information. The public can access water quality and chemistry testing information, including conventional pollutants and toxic pollutants (i.e. heavy metals) throughout Vermont.

VT ANR Atlas. The Atlas is a map-based tool that displays the WSMD monitoring sites, including the type of data (macroinvertebrate, fish, chemistry, habitat), and color-coded assessment for that type of data, and other geographical information.

Vermont NPDES Permits. NPDES permits are located and can be viewed electronically through the Department of Environmental Conservation Wastewater Program website.

Summary of Management Requirements:

Water Quality Monitoring and Reporting (CWA § 305(b) Report and §303(d) List). The Clean Water Act requires that every state develop and submit to EPA two surface water quality-related documents. The documents, prepared every two years, arise out of two sections of the Act. Section 305b of the Act requires submittal of a report that describes the quality of the State's surface waters and that contains an analysis of the extent to which its waters provide for the protection and propagation of a balanced population of fish, shellfish and wildlife. This analysis is also referred to as the extent to which Vermont's waters achieve the Act's "fishable and swimmable" goals. The biennial Vermont Water Quality Assessment Report is commonly known as the "305b Report."

Section 303(d) of the Act, is a listing of surface waters that: (1) are impaired or threatened by one or more pollutants; and, (2) are not expected to meet Water Quality Standards within a reasonable time even after the application of best available technology standards for point sources of pollution or best management practices for nonpoint sources of pollution; and, (3) require development and implementation of a pollutant loading and reduction plan, called a Total Maximum Daily Load (TMDL), which is designed to achieve Water Quality Standards.

Toxics Monitoring Data. Using both Toxics Release Inventory (TRI) and Discharge Monitoring Report (DMR) data provides a more complete understanding of toxic chemical releases to surface waters. This TRI data and the DMR data allows loadings to be calculated independently; presents pollutant loadings as pounds per year and as toxic-weighted pounds (TWPE) per year. Ranks dischargers, industries, and watershed based on pollutant mass and toxicity.

Water Quality Monitoring. WSMD maintains a comprehensive monitoring program, although monitoring for toxic constituents is not typically routine. WSMD does partner with Departments of Health, and Fish and Wildlife, and the Lake Champlain Basin Program, to monitor fish tissue for certain contaminants – notably mercury, but also other chemicals. As needed sediments of ponds, lakes, or streams will also be assessed for chemical contamination, in response to proposals for dam removals, where sediments may be mobilized. Because sampling for certain toxic contaminants in surface waters is at once expensive, and scientifically-uncertain, this type of testing is reserved for areas of assumed impact, such as landfills, mines, hazardous waste sites, or spills. WSMD routinely interacts with the Waste Management and Prevention Division in the assessment of these types of sites. Vermont Act 64 of 2015 requires that all such data be made publicly-available through an online resource.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

For contaminants listed in the Water Quality Standards, the present NPDES programs, including the application of the Toxics Discharge Controls Strategy, are sufficient for controlling priority pollutants,

or other pollutants for which toxic thresholds have been derived. This protects human health and all designated uses of surface waters.

However, there is a large and ever-expanding universe of contaminants for which present Clean Water Act provisions may not suffice. Development of contaminant thresholds for new and contaminants of emerging concern (CECs), under section 304(a) of the Clean Water Act, or under State authority, will enable NPDES permits to more fully control risks due to surface water contamination. The Toxics Discharge Control Strategy may merit updating to account for new information about contaminants of emerging concern (CECs).

VERMONT CLEAN WATER ACT PROGRAMS

Public Notice of Wastewater Discharges (Act 86)

Statutory Authority: 10 V.S.A. § 1295

Regulatory Authority: N/A

Administering Agencies/Departments:

The State of Vermont has been delegated to administer the federal National Pollutant Discharge Elimination System (NPDES) in lieu of the Environmental Protection Agency (EPA). Act 86 of 2016 provided the Agency of Natural Resources (ANR) with additional authority to require public notice of certain releases from wastewater treatment facilities (this type of public notification of wastewater discharges is not required under federal regulations).

Overview of Regulatory Program:

Act 86 establishes public notification requirements for releases of less than fully treated wastewater from a wastewater treatment facility (WWTF) to Vermont's surface waters, all Combined Sewer Overflow (CSO) events, and all other unpermitted discharges to surface waters that may pose a threat to human health or the environment. The Act establishes requirements for permanent signage to be placed at all CSO outfalls and for temporary signage downstream of an actual release.

Summary of Chemicals/Regulated Substances:

Act 86 does not regulate any specific substances.

Summary of Reporting Requirements:

Act 86 requires operators of WWTFs to post a notice on a publicly available electronic network of any release of less than fully treated effluent to a Vermont surface water as soon as possible, but no later than one hour, after the discovery of the discharge. In the event that the operator is actively engaged in controlling or stopping the discharge or is at a location without cell phone or internet access, the reporting window is extended to no more than four hours after the discharge is discovered. The Act also provides that the operator must provide direct notification of the discharge to the Agency and the local Health Officer within twelve hours of its discovery in order to accommodate situations where the discharge is discovered outside of those staffs' normal working hours.

The Agency has developed and activated an on-line public/Agency notification system that serves both notification requirements. That system is also used for the required notification/reporting of unpermitted discharges (failed septic systems discharging to surface waters, illicit direct discharges, illicit discharges to a stormwater collection system, etc.).

The electronic notifications are required to provide the following information: (1) the specific location of the discharge, (2) the date and approximate time the discharge started and ended, (3) the approximate total volume of the discharge, (4) the cause of the discharge, (5) a characterization of the waste

discharged, (6) the name of the person reporting the discharge, (7) contact information, and (8) any other information that the Secretary of the ANR may require.

The Act requires every municipality that has any CSO outfalls to post permanent signs at each outfall which advise the public about what they are and which provide health advisory information related to releases from them. The Act also requires a municipality to post temporary signs at public access areas downstream of a release, that warns the public of the release and provides relevant health warning information. The signs must remain in place for a minimum of 48 hours after the release has stopped. The distance downstream in which signs must be posted is not limited by municipal boundaries and is jointly determined by ANR and Department of Health staff and the local Health Officer.

Summary of Management Requirements:

Act 86 requires notification of discharges as summarized in the above section. The Act does not impose any additional management requirements.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The notification and public notice system developed by the Agency has provided an effective and efficient system for the reporting and public notification of these releases. Future enhancements are planned to include a subscription service that will provide for direct, instantaneous notification via e-mail to all subscribers whenever a release notice is posted to the reporting web site.

Now that it is active, the reporting web site requires minimal support staff and funding to maintain.

VERMONT DRINKING WATER AND GROUNDWATER PROTECTION PROGRAMS

Safe Drinking Water Program
Water Supply Program

Statutory Authority: Safe Drinking Water Act 42 (U.S.C. §§300f to 300j – 26);
10 V.S.A. chapters 48, 56, and 61;
18 V.S.A. § 1218

Regulatory Authority: 40 C.F.R. Parts 141 – 143; Vermont Water Supply Rule

Administering Agencies/Departments:

The State of Vermont has been authorized to administer the federal Safe Drinking Water Act (SDWA) program in lieu of the Environmental Protection Agency (EPA). The Drinking Water and Groundwater Protection Division (DWGWPD) within the Vermont Department of Environmental Conservation (DEC) administers the Safe Drinking Water and Water Supply programs.

Overview of Regulatory Program(s):

The aim of these programs is to protect the public health by assuring safe, affordable drinking water from both public and non-public water systems. The DWGWPD fulfills this purpose by working with drinking water system operators to maintain safe drinking water, conducts sanitary surveys of public drinking water systems, administers various rules regarding the sampling of water supplies, and issues permits for water system construction, operator certification, and well driller licensure.

Summary of Regulated Substances:

Public water systems are required to monitor certain groups of microorganisms and chemicals (more than 90 total contaminants) on a regular basis, as prescribed by federal and state regulations. The chemicals encompass disinfectants, disinfection by-products, inorganic chemicals, organic chemicals, and radionuclides. Most of these have Maximum Contaminant Levels (MCLs) set as a standard under the National Primary Drinking Water Regulations, with which public water systems are required to comply.

The SDWA includes a process that EPA must follow to identify and list unregulated contaminants for consideration to be regulated. This process requires EPA to periodically publish this list (called the Contaminant Candidate List or CCL), and decide whether to regulate at least five or more contaminants on the list (called a regulatory determination). A regulatory determination is a formal decision on whether EPA should initiate a rulemaking process to develop a National Primary Drinking Water Regulation for a specific contaminant. SDWA requires that EPA make a regulatory determination by considering three criteria: contaminant may have an adverse effect on people's health, the contaminant is known (or there is a high chance) that the contaminant will occur in public water systems often enough and at levels of public health concern, and that the regulation of the contaminant presents a meaningful opportunity for health risk reduction. To determine likelihood of contaminants in public water systems, EPA has a regular monitoring program (called the Unregulated Contaminant Monitoring

Rule, or "UCMR", as required by SDWA) to determine actual levels of contaminants on the CCL that are currently present in public water systems.

UCMR3 (the third nation-wide monitoring event) looked at several contaminants of emerging concern (CECs) for public water systems, including PFOA/PFAS. The UCMR4 list has recently been published, with monitoring set to begin in 2 years (2018). The UCMR4 list includes cyanotoxins, metals, pesticides, disinfectant by-products, alcohols, certain semi-volatile chemicals, and other water chemistry information. Public water systems chosen by EPA to be part of the UCMR sampling must report their data to EPA.

Summary of Reporting Requirements:

The public drinking water systems are required to systematically report the samples they take. Typically, the certified laboratories send the data electronically and these data become part of the Safe Drinking Water Information System (SDWIS). Some hand-entry is also done by administrative support staff. EPA provides the states results of the UCMR sampling.

The public has access to the monitoring data in several ways. One is the "Consumer Confidence Report" (also frequently known as the Water Quality Report); this is issued by July 1st annually for community public water systems. Drinking Water Watch, available on EPA's and Vermont's Drinking Water and Groundwater Protection Division's websites, is another way the public can view these data. Third, the Centers for Disease Control provides funding to the Vermont Department of Health, that allows them to publish on their website an excerpt of the SDWIS data maintained by the Drinking Water and Groundwater Protection Division.

Summary of Management Requirements:

To manage public health risk from microbial contamination, disinfection is a fundamental requirement of public water systems. Sodium hypochlorite is the most commonly used disinfectant, but the largest public water system in Vermont (Champlain Water District), which serves a good portion of Chittenden County, uses ammonium sulfate to produce monochloramine, a secondary disinfectant in addition to the primary disinfectant sodium hypochlorite. Public water systems using surface water intakes (as opposed to groundwater wells) also must employ filtration to control microbial contaminants that do not necessarily respond well to disinfection. To make the filtration process highly effective, systems add coagulant (e.g. aluminum sulfate) and flocculants (e.g. cationic and nonionic polymers).

For systems that are required to control for lead and copper leaching (corrosion control) from piping, zinc orthophosphate (or polyphosphate) is commonly used. Sodium hydroxide is also used to control pH, which optimizes the use of phosphates for corrosion control.

Other treatment processes may employ chemicals for water treatment, as long as they are ANSI NSF Standard 60 approved.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

For public water systems, particularly those large systems that are necessarily reliant on surface water, a balance of microbial risks with chemical risks (i.e. disinfection by-products) is a constant technical reality that drinking water operators and regulating entities face. For most groundwater systems, the major threat is naturally occurring contaminants (e.g. arsenic and radionuclides); UCMR monitoring has shown non-detect levels for potential threats (the requirement for Source Protection Areas around public water system wells has contributed to this safety). While some de minimis exposure to chemicals can occur due to treatment, there is an overall benefit to public health due to public drinking water systems - safe drinking water of known quality, safely met sanitation needs, fire protection, and economic development.

VERMONT DRINKING WATER AND GROUNDWATER PROTECTION PROGRAMS

Indirect Discharge Program

Statutory Authority: 10 V.S.A. Chapter 47; 10 V.S.A. § 6616 (Chapter 159); 10 V.S.A. §§ 901, 905b (Chapter 37); 10 V.S.A. § 1390 (Chapter 48)

Regulatory Authority: Environmental Protection Rules Chapter 14, Indirect Discharge Rules

Administering Agencies/Departments:

The Indirect Discharge Program is administered through the Drinking Water & Groundwater Protection Division of the Department of Environmental Conservation, Agency of Natural Resources.

Overview of Regulatory Program:

Indirect discharges are discharges to a privately- or publicly-owned treatment works with permitted flows of 6,500 gallons per day (GPD) or more that discharge treated effluent to soil-based systems, as opposed to a discharge directly to receiving waters (a direct discharge). The Indirect Discharge Program regulates indirect discharges of sewage that are not regulated pursuant to the Wastewater System and Potable Water Supply Rules. It also regulates indirect discharges of non-sewage waste that began after May 17, 1986 ("new" indirect discharges); an example of non-sewage wastes include the land application of non-sewage wastewater, primarily food processing wastes generated from manufacturing of a food or beverage product.

The goals of the program are to ensure that indirect discharges comply with the Aquatic Permitting Criteria of the Indirect Discharge Rules and with the Vermont Water Quality Standards (VWQS); that indirect treatment and disposal systems are designed and constructed in a manner that will provide reliable protection of the public health, groundwater, and surface water during operation and maintenance; that new indirect discharges of sewage from systems with a design capacity of 6,500 gallons per day or more will not significantly alter aquatic biota, pose more than a negligible risk to public health, and will be consistent with existing and potential beneficial uses of receiving waters. Additionally, indirect discharges should comply with the requirements in the Groundwater Protection Rule & Strategy.

Indirect Discharge Permits require inspections, monitoring and reporting on a monthly, quarterly and/or annual basis. Program staff review monitoring reports and issue Notice of Violations when determining a permittee is out of compliance with their permit.

Summary of Chemicals/Substances Regulated:

The Indirect Discharge Program (IDP) regulates pathogens and nutrients such as nitrogen and phosphorus. Permittees comply with effluent limits established in the permits. For sewage systems, the Indirect permits prohibit the discharge of anything other than sanitary sewage to the collection, treatment and disposal systems. For non-sewage permits, the Indirect Program may require toxic scan analyses of the wastewater to verify that the waste is non-hazardous and in compliance with groundwater standards and/or the Water Quality Standards.

Summary of Reporting Requirements:

The Indirect Discharge Program includes management and compliance activities by inputting monitoring data and performing statistical analyses of groundwater and surface water data to determine if applicable standards are being met when permits are renewed, reviewing monthly and quarterly disposal reports, reviewing annual inspection reports and proposals for improvements, and when necessary, issuing Notices of Violations for non-compliance. Reported information is maintained via electronic files and is available to the public upon request.

Summary of Management Requirements:

Management requirements include physical inspections by license Professional Engineers on an annual basis, monitoring of waste stream, groundwater and surface water quality monthly, quarterly, and/or annual reporting. Permits are renewed every 5 years, which is another level of management for confirming compliance with permit conditions and regulatory standards.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Compliance activities are a priority with the Indirect Discharge Program and performance is measured by whether the systems meet Aquatic Permitting Criteria and water quality standards. Historically, the IDP has shown 100% compliance with in-stream monitoring requirements. The program is currently staffed with 1 full-time and 2 part-time employees and it is believed to be adequately but minimally staffed as the number of employees dedicated to this program has been reduced over the years. Non-sewage permits may require coordination with the Underground Injection Control program, Wastewater System and Potable Water Supply Program, and Agency of Agriculture on-farm activities.

VERMONT DRINKING WATER AND GROUNDWATER PROTECTION PROGRAMS

Groundwater Protection Rule & Strategy

Statutory Authority: 10 V.S.A. chapter 48 §§ 1390 – 1394

Regulatory Authority: Vermont Environmental Protection Rules, Chapter 12

Administering Agencies/Departments:

Section 1390 of Title 10 of the Vermont Statues establishes that it is a policy of the State of Vermont to protect its groundwater resources to maintain high-quality drinking water and to manage its groundwater resources to minimize the risks of groundwater quality determination from human activities. In 2008 Section 1390 was amended to include the policy that the groundwater resources in the State be held in the public trust. The Groundwater Protection Rule and Strategy ("GWPR&S"), in conjunction with the Interim Groundwater Quality Standards, and the Interim Procedure for Implementation of Groundwater Public Trust Principles for Groundwater Quality ("the Interim Procedure"), implement these policies by establishing groundwater quality standards, procedures for groundwater classification, and restrictions and standards that apply within the context of existing Agency of Natural Resources permitting programs addressing activities that could affect groundwater. The GWPR&S does not create a standalone permitting program. The Agency is working on a revision to the GWPR&S to incorporate the Interim Groundwater Quality Standards and the Interim Procedure.

Summary of Regulated Substances:

The GWPR&S, in conjunction with the Interim Groundwater Quality Standards, establishes a list of over 200 chemicals and other substances, including coliform, and adopts groundwater quality standards for each. The standards are referred to as Primary Groundwater Quality Standards and Secondary Groundwater Quality Standards. The standards are intended to identify a broad range of chemical constituents that may pose a risk to the beneficial uses of groundwater. The GWPR&S also identifies preventive action levels, which serve as an early warning mechanism of potential groundwater quality degradation.

The Primary Groundwater Quality Standards are based on Maximum Contaminant Levels (MCLs) established by the Environmental Protection Agency for drinking water or, where no MCL for a substance exists, the Vermont Health Advisory established by the Vermont Department of Health. Per a memorandum of agreement between the Agency and the Vermont Department of Health, the GWPR&S revision will incorporate Vermont Action Levels as the groundwater quality standard when it is lower than the MCL. The Secondary Groundwater Quality Standards are based on secondary drinking water quality standards adopted by EPA.

Summary of Reporting Requirements:

Compliance points, specific to the activity being regulated, are identified and used to determine where groundwater quality standards must be met. Under existing Agency permitting programs, the Agency may require activities which may affect groundwater to monitor for specific listed substances. The

Agency also may require the development of a Design Management Zone around an activity in which groundwater is monitored to evaluate the fate and migrating of particular substances. If groundwater monitoring indicates the presence of a listed substance at its preventive action level at a compliance point, the Agency may direct the owner or operator of the activity to prepare and submit an evaluation report assessing the cause and significance of the concentration of the substance.

Summary of Management Requirements:

ANR may require an owner or operator of an activity to take response actions, including closure or abandonment of the activity or remedial action to restore groundwater quality, if groundwater monitoring indicates that the groundwater quality standard is exceeded.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The GWPR&S ensures that permitted activities do not expose consumers of drinking water from private and public wells to substances above the Groundwater Quality Standards.

VERMONT DRINKING WATER AND GROUNDWATER PROTECTION PROGRAMS

Vermont Underground Injection Control Program

Statutory Authority: 42 U.S.C. §§ et seq. (Safe Drinking Water Act); 10 VSA, Chapter 47

10 V.S.A. chapter 159, § 6616; 10 V.S.A. chapter 37, §§ 901, 905b; 10 V.S.A. chapter 48, § 1390

Regulatory Authority: Environmental Protection Rules Chapter 11; Vermont Underground Injection Control Regulations

Administering Agencies/Departments:

The State of Vermont has been authorized to administer the federal Safe Drinking Water Act (SDWA) program requirements for the Underground Injection Control (UIC) Program in lieu of the Environmental Protection Agency. The program is administered by the Drinking Water & Groundwater Protection Division of the Department of Environmental Conservation.

Overview of Regulatory Program:

The purposes of the UIC program are to; (1) protect the quality of groundwater in the State of Vermont by regulating the discharge of waste into injection wells; (2) assure that injection wells are designed, constructed, operated, maintained, converted, abandoned and closed in a manner that complies with the Groundwater Protection Rule and Strategy (GWPRS); and (3) protect the groundwater resources that are held in trust for the public.

Injection Wells means a disposal system or any bored, drilled, or driven shaft, dug hole, or any other opening in the ground that is used to discharge waste, either under pressure or gravity, to the soil or groundwater. Injection wells includes those wastewater systems used to dispose of the waste and waste streams listed in the UIC Regulations. (Note: The majority of wastewater systems are regulated under the Wastewater System and Potable Water Supply Rules.) There are six “classes” of underground injection wells identified by statute; Class I, II and III wells are prohibited in Vermont. Class IV wells are prohibited except for a Class IV well that is installed and utilized pursuant to a corrective action plan approved by the Secretary under 10 V.S.A. Chapter 159 or a response action taken pursuant to CERCLA. Many high-risk activities and facilities for Class V wells are prohibited by regulation. The UIC program prohibits the discharge of hazardous materials into injection wells and prohibits certain high risk activities in the vicinity of injection wells.

Permits are required for wells that receive process wastewater that is not regulated as a hazardous waste. These permits require detailed technical and scientific reviews and compliance activities including sampling of waste streams and groundwater monitoring. These permits require renewals whereby an evaluation of whether the wells are remaining within permit standards related to the requirements listed in the GWPRS.

Summary of Chemicals/Substances Regulated:

The UIC permit program regulates certain activities to protect drinking water sources and achieve groundwater quality standards identified in the Vermont Water Supply Rules and in the GWPRS. Permits are required for non-hazardous waste from a variety of activities, including:

- injection wells that receive process wastewater from industrial facilities, including packaging paper & plastics film, plastics packaging; printing and publishing; chemicals and allied products; steel foundries; plastic products; furniture finishing; metal fabricators and metal platers; electronic parts manufacturing; and pharmaceuticals;
- quarries or other sites where materials are extracted if perchlorate is used for blasting, excluding perchlorate in blasting caps; or
- injection wells that receive aircraft de-icing fluid waste;
- injection wells that receive laboratory waste;
- injection wells that receive boiler blow down waste or 1000 gallons or more per day of cooling water; and
- other Class V wells if the Secretary determines, based on clear and convincing evidence, that the operation of the well is causing a violation of the GWPRS.

Certain types of UIC activities are exempt from permitting requirements, provided certain conditions are met. These activities include:

- a Class IV or Class V well that is installed and utilized consistent with a corrective action plan approved by the Secretary pursuant to 10 V.S.A. Chapter 159 or a response action taken pursuant to CERCLA;
- open loop geothermal systems, including standing column wells, used for heating and/or cooling;
- injection wells that receive backwash from certain water treatment units
- injection wells that receive waste from in-line chlorine or fluorine analyzers at water treatment plants;
- injection wells where mining wastes are discharged; and
- injection wells that are subject to regulation under other permitting programs administered by the Secretary including, but not limited to, solid waste facilities, indirect discharge systems, stormwater systems, and wastewater systems.

Regarding contaminants, the UIC permit requires the landowner to characterize the constituents in a waste stream depending on the activity and to confirm that the wastewater to be discharged does not contain contaminants at concentrations that would result in an exceedance of a primary groundwater enforcement standards of the GWPRS at a compliance point. If the waste does not meet standards at the point of discharge, groundwater monitoring is required. Since this program is related to the SDWA and monitoring of groundwater for regulated and unregulated contaminants, the program may on a case-by-

case basis, require monitoring for contaminants identified by the Unregulated Contaminant Monitoring Rule.

Summary of Reporting Requirements:

Permits typically include requirements for monitoring of identified chemicals in the waste stream. Reporting is required to be submitted along with inspections, analyses of compliance with the GWPRS and Water Supply Rule, and recommendations for any improvements where exceedances occur. Reported information is available to the public on a request for information.

Summary of Management Requirements:

Management requirements include physical inspections by licensed Professional Engineers on an annual basis, waste stream and groundwater monitoring, performing statistical analyses to determine if applicable standards are being met, and quarterly and annual reporting. Permits are renewed on a five-year cycle, which is another level of management for confirming compliance with permit conditions and regulation standards.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Injection wells that are subject to regulation under other permitting programs administered by the Secretary are exempt from UIC permitting to reduce redundant requirements. However, there are instances of gaps between UIC and other DEC permitting programs and case-by-case determinations are made to identify which program(s) will be involved with the activity. In some low risk cases, such as roof drain runoff to injection wells, no program may be involved. The UIC program includes one dedicated staff member with 2 part-time staff recently added. It appears this will be adequate to implement this program. However, if the Rules are revised to require registrations of floor drains and other activities, staffing levels may need to be reconsidered.

VERMONT WASTE MANAGEMENT PROGRAMS

Residual Waste and Emerging Contaminants Program

Statutory Authority: 33 U.S.C. § 1345; 10 V.S.A. chapter 159

Regulatory Authority: 40 C.F.R. Part 503; 40 CFR Part 258;
Vermont Solid Waste Management Rules;
Wood Ash Management Procedure;
Short Paper Fiber Management Procedure

Administering Agencies/Departments:

The State of Vermont's Agency of Natural Resources (ANR) has been not been delegated to administer the federal sewage sludge program in lieu of the Environmental Protection Agency (EPA) under ANR's current National Pollutant Discharge Elimination System (NPDES) authority to administer the direct discharge, industrial pretreatment, stormwater, and CAFO programs.[2] However, EPA plays no role in the oversight or administration of the Residual Waste & Emerging Contaminants Program (the Program) in Vermont, and has not initiated any sludge related activities or actions on its own volition in over twenty-five years. Therefore, regulation of residuals and sludges is, in effect, administered by the Residual Waste & Emerging Contaminants Program of the Waste Management & Prevention Division (WMPD) within the Department of Environmental Conservation (DEC).

EPA has authority for regulating the management of the non-sewage residual wastes pursuant to 40 CFR 257.3-5, its suite of landfill regulations, and hazardous waste regulations under RCRA.

Overview of Regulatory Program:

The Residual Waste and Emerging Contaminants Program oversees the management of residuals, which are semi-solid materials produced as a byproduct of the treatment of industrial or municipal wastewater. Approximately 8,500 – 9,000 dry tons of wastewater sludge is generated annually by wastewater treatment facilities located and operating in Vermont. The Program oversees the management of this waste, including land application, landfill disposal (after dewatering), and incineration.

[2] In 1998, Vermont applied to EPA for federal delegation to administer its sludge management programs. The delegation request was submitted for authority under 40 Part 257 (which addresses application of solid wastes to agricultural lands) because sludge is defined as a solid waste under Vermont statute. Vermont was the last state that EPA allowed to do so. In most states, sludge management is regulated under the state's NPDES authority, and the seven states currently delegated to administer the biosolids program for EPA are delegated under the NPDES authority of 40 Part 503. However, for various reasons, Vermont's delegation request has not received a formal determination and is no longer actively pursuing delegation.

Summary of Regulated Substances:

In Vermont, "residual wastes" include sewage sludge (biosolids), septage, wood ash, short paper fiber, and sludge produced by the biological treatment of certain dairy wastewaters.

For biosolids and septage, the process of identifying potential pollutants for regulation under 40 CFR Part 503 began in 1984 when EPA developed a list of 200 chemicals for consideration based on available data concerning human exposure and health effects, plant uptake, phytotoxicity, effects on domestic animals and wildlife, effects on aquatic organisms, frequency of occurrence in sludge, the probability that the pollutant would be toxic when exposure occurred through the use or disposal of biosolids, and the availability of toxicity and exposure data.

Initial screening of the 200 listed chemicals eliminated 150 of the originally listed pollutants, due to either having been banned from production and use in the United States, their low frequency of occurrence/low concentrations in sludge, or because there was insufficient exposure and toxicity data to make an evaluation. For each of the remaining 50 pollutants, EPA developed a Hazard Profile that ranked each based on the estimated concentration of the pollutant in soil, plant or animal tissue, groundwater, surface water, or air; and the lowest concentration of the pollutant shown to be toxic via the most sensitive route of exposure. Every pollutant that was scored with a Hazard Rating of greater than 1 (the range was <1 to >1000) was subjected to a detailed and highly conservative human and ecological risk assessment.

Ultimately, EPA established pollutant standards for ten heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc) under two tables. The higher Table 1 limits apply to biosolids managed via application to specific sites permitted under federal or state permits. The lower Table 3 limits apply to biosolids which receive an advanced level of treatment and which may be marketed and distributed to the general public for unrestricted use. Federal court action vacated the EPA standards for chromium and molybdenum, however those standards continue to be enforced in Vermont. EPA has subsequently evaluated nearly 1,100 additional chemicals, some contaminants of emerging concern (CECs) among them, in subsequent biennial reviews using the same criteria as were used to evaluate the initial group of 200 chemicals in 1984. Of that group, approximately 25 chemicals are being further evaluated for the need to establish standards, with the remainder having either been eliminated from consideration due to insufficient data or as the result of a risk assessment determining that they presented minimal risk and that a standard was not warranted.

The pollutant standards established in the VSWMR are all less than or equal to the lower Table 3 federal standards. The VSWMR also establishes a limit for PCBs in biosolids. Those pollutant standards also apply when the other residual wastes are managed via application to the land.

Summary of Reporting Requirements:

40 CFR 503.18 only requires Class 1 wastewater treatment facilities (i.e., those facilities with a design flow of greater than one million gallons per day, or that serve a population of 10,000 people or more), to submit an annual report to EPA of their sludge management activities (with no reporting requirement at

all for non-Class 1 WWTFs). Class I wastewater treatment facilities constitute only 30 of the 94 municipal wastewater treatment facilities in Vermont. However, EPA lacks the staff necessary to conduct timely reviews of those Class 1 facility reports, and many go un-reviewed.

The VSWMR requires all residual waste managers to submit quarterly reports of their waste management activities by the 15th day of the month following the end of each calendar quarter. Quarterly reports include the volume, location, and method of management information, as well as all required monitoring data. Quarterly reports are generally reviewed by program staff within 30 days of their receipt.

Summary of Management Requirements:

For sewage sludge disposed by landfilling, minimal requirements apply. The waste must pass the paint filter test (demonstrating that it contains no free liquids) and may not be classified as a hazardous waste. Otherwise, the receiving landfill must be operating under the applicable federal and state regulations for such facilities.

Residual wastes disposed by application to the land are subject to a wide variety of management and monitoring practices. At a minimum, land application facilities are required to monitor waste quality, the quality of groundwater flowing beneath the site, soil chemistry, and plant tissue quality of crops grown on the site. Public access to sites must be restricted for a minimum of one year following the last application of waste and there are a variety of other restrictions on how the sites and crops grown thereon may be used, which extend out as far as 38 months following the last application of waste.

Residual wastes managed in this fashion are also subject to strict pathogen reduction standards that must be achieved before the waste may be applied to the land. Application rates are also strictly controlled with the intended result that there is a net balance of 'zero' between nutrients applied and nutrients taken up by the crops grown on the site, and must be calculated using a model developed by the Program. Limits are also established for the maximum cumulative mass of each of the regulated pollutants that may be applied to a site throughout its use.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The management of biosolids and septage via application to the land remains a highly controversial matter due to perceptions regarding potential adverse impacts to human health and the environment, as the practice does release pollutants to the environment. Regardless, over the more than 25-year history of the Residuals Management Program in Vermont, it has not been demonstrated that this management strategy has manifested adverse impacts. The highly conservative risk analysis, from which the pollutant limits were established to be protective of an extremely small population of "highly exposed individuals" (and the correspondingly lower Vermont limits), and the monitoring and management practices required in Vermont (which are all more restrictive than 40 CFR Part 503 and those of a majority of the other states), have resulted in this management strategy being highly effective at protecting human health and the environment.

In general, Vermont has inadequate funding and staff with the technical expertise to conduct its own risk analysis of contaminants of emerging concern (CECs) to the level of detail used in EPA's on-going efforts in this area. To date, only the Vermont limit on arsenic (VT – 15 ppm, EPA – 41 ppm) has been established based on a risk analysis that was conducted by Vermont Department of Health staff, in which 100% of the arsenic in biosolids was assumed (although not demonstrated) to exist as carcinogenic inorganic arsenic compounds.

The Residuals Management Program is currently staffed with one FTE and anticipates adding another FTE in 2017. Two FTE is the minimum necessary to provide an adequate level of staffing. Although part of the funding for the two FTE is derived from the Solid Waste Management Assistance Fund, the Program is able to completely fund its activities via a fee of $10 per 1000 gallons of septage managed in Vermont, which generates approximately $400,000 annually.

VERMONT WASTE MANAGEMENT PROGRAMS

Spills Management Program
Contaminated Sites Program

Statutory Authority: 42 U.S.C. § 6901 et seq; 10 V.S.A. Chapter 159

Regulatory Authority: 40 C.F.R. subchapter J, §§ 300 – 374.6
Vermont Hazardous Waste Management Regulations;
Solid Waste Management Rules;
Groundwater Protection Rule and Strategy;
Water Supply Rule

Administering Agencies/Departments:

The Waste Management & Prevention Division (WMPD) of the Department of Environmental Conservation (DEC) administers both the Spills Management and Contaminated Sites Programs.

Overview of Regulatory Program:

Spills Management: The DEC Spill Team assesses the environmental impact of hazardous materials spills, oversees the cleanup of spills, and enforces environmental laws and regulations triggered by spills. Upon responding to a report of a spill, the Team performs immediate containment measures to ensure that the release does not spread. Remediation and actual cleanup begin only after containment measures have been completed, unless they can be done concurrently. A representative of the team is available 24-hours a day, year-round. The Spills Team works with first response organizations and responsible parties to determine if a spill impacts or threatens sensitive receptors such as surface waters or drinking water wells. Team members oversee the cleanup of a spill, and work with the Environmental Enforcement Division to enforce environmental regulations triggered by spills. The Spill Team has the authority to hire cleanup contractors when the responsible party cannot be identified in a timely manner or is unwilling/unable to conduct the cleanup. It is also obligated to pursue cost recovery from potentially responsible parties when State funds have been expended. Spills must be reported immediately (as response allows). For spills that impact (or potentially impact) surface water, the responsible party is also required to notify the National Response Center.

Contaminated Sites: The Sites Management Section of the WMPD provides oversight for the investigation and cleanup of properties where a release of a hazardous material has contaminated the environment, including soils, groundwater, surface water and indoor air under state and federal authorities, including the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA, also known as Superfund). Responsible Parties are required to follow the Investigation and Remediation of Contaminated Properties Procedure (soon to become a rule) to ensure a sufficient investigation and cleanup is performed. See the RCRA Subtitle C Hazardous Waste Management Program and CERCLA Program Summaries within this Appendix for additional information.

Summary of Chemicals/Substances Regulated:

The Spills Management Program and Contaminated Sites Programs focus on responses to, management, and remediation of hazardous materials and hazardous wastes. "Hazardous materials" include all petroleum and toxic, corrosive or other chemicals and related sludge included in any of the following:

(i) any substance defined in section 101(14) of the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980;

(ii) petroleum, including crude oil or any fraction thereof; or

(iii) hazardous wastes, as determined under 10 V.S.A. Section 6602(4).

"Hazardous materials" do not include herbicides and pesticides when applied consistent with good practice conducted in conformity with federal, state and local laws and regulations, and according to manufacturer's instructions.

"Hazardous wastes" are any waste or combination of wastes of a solid, liquid, contained gaseous, or semi-solid form, including those which are toxic, corrosive, ignitable, reactive, strong sensitizers, or which generate pressure through decomposition, heat, or other means, which in the judgment of the Secretary may cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, taking into account the toxicity of such waste, its persistence and degradability in nature, and its potential for assimilation, or concentration in tissue, and other factors that may otherwise cause or contribute to adverse acute or chronic effects on the health of persons or other living organisms, or any matter which may have an unusually destructive effect on water quality if discharged to ground or surface waters of the State. This definition excludes all special nuclear, source, or by-product material, as defined by the Atomic Energy Act of 1954 and amendments thereto, codified in 42 U.S.C. § 2014, is specifically excluded from this definition.

An emerging contaminant that meets the general definition of "hazardous waste" and the criteria for listing additional wastes may be added as a "listed" hazardous waste under the VHWMR. For instance, the State listed certain PFOA and PFOS wastes as hazardous wastes in 2016 based on the factors referenced above. Despite the ability to list additional wastes for regulation, the listing process is generally perceived as burdensome, cumbersome, and ineffective at affecting some categories of hazardous substances, such as pharmaceuticals, to become regulated as hazardous waste when discarded. Additionally, it is difficult if not impossible to list and regulate a substance as a hazardous waste where the potential risks of that substance are not fully understood (i.e. contaminants of emerging concern (CECs).

Summary of Reporting Requirements:

Vermont law requires that any person who has knowledge of a release or a suspected release of a hazardous material and who may be subject to liability pursuant to 10 V.S.A. § 6615 must immediately notify the Agency. Regulations promulgated under 10 V.S.A chapter 159 that regulate hazardous waste require specifically that the following is reported the Agency: (1) Any discharge of hazardous waste, or release of hazardous material that exceeds 2 gallons; (2) A discharge of hazardous waste, or release of

hazardous material that is less than or equal to 2 gallons and poses a potential or actual threat to human health and the environment; (3) A discharge of hazardous waste, or release of hazardous material that equals or exceeds its corresponding reportable quantity under CERCLA as specified under 40 C.F.R. § 302.4.

Information related to reported spills and contaminated sites are maintained on a publicly-available Environmental Research Tool (ERT) searchable database as well as on a public mapping tool (the ANR Atlas). Additional information and public records may be inspected pursuant to the Vermont Public Records law (1 V.S.A. chapter 5).

Summary of Management Requirements:

All remediation wastes, clean-up debris, and other residues generated from investigation and remediation activities (resulting from a spill or required of a Responsible Party at a contaminated site) that are hazardous waste shall be managed in accordance with the Vermont Hazardous Waste Management Regulations. All other wastes that are not hazardous shall be managed consistent with the requirements of 10 V.S.A. chapter 159. Active listed (contaminated) sites on the hazardous waste sites list are specifically required to be managed following the Investigation and Remediation of Contaminated Properties Procedure.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Spills Management: As the Spill Team's role is response-oriented (ensuring that releases get cleaned up quickly and efficiently), the Team does not have procedures or processes in place specifically to target prevention of releases. However, many responsible parties commonly take efforts to prevent future releases after going through the process of ensuring a cleanup occurs so as to limit the need to do so again as much as possible for releases that could be more easily prevented (i.e. routine equipment inspection/preventive maintenance). Additionally, the Spills Team works closely with other groups and programs in the Department that more directly affect prevention (i.e. Environmental Assistance Program, the Storage Tanks Program, which provides financial assistance for aboveground storage tank replacements). Additionally, the Spills Program works in conjunction with local first responders and the Vermont Hazardous Materials Response Team.

Contaminated Sites: The Sites Management Section's responsibility is to oversee the cleanup of a release of regulated material once they are released into the environment, and therefore, is also response-oriented in its mission. In regards to contaminants of emerging concern (CECs), the Section generally refers to the Environmental Protection Agency's Maximum Contaminant Levels (MCLs) for most compounds and contaminants with the exception of specific risk-based numbers developed by the Vermont Department of Health for a small number of contaminants. The Section works closely with the Spills and Tanks programs as well as with other Division's within DEC.

VERMONT WASTE MANAGEMENT PROGRAMS

Resource Conservation and Recovery Act
Subtitle C/ Hazardous Waste Management Program

Statutory Authority: U.S.C. § 6901 et seq; 10 V.S.A. Chapter 159

Regulatory Authority: 40 C.F.R. Parts 261-279; Vermont Hazardous Waste Management Regulations (VHWMR)

Administering Agencies/Departments:

The State of Vermont is authorized by the Environmental Protection Agency (EPA) through 40 CFR Part 271 to administer the federal RCRA Subtitle C hazardous waste program in the State. Agencies that share regulatory authority to administer the Vermont hazardous waste program through various subprograms are:

- Agency of Natural Resources (ANR) (hazardous wastes);
- Agency of Agriculture, Food, and Markets (AAFM) (pesticides/economic poisons);
- Department of Health (DOH) (low-level mixed waste).

Overview of Regulatory Programs:

Hazardous Waste. ANR's Hazardous Waste Program regulates hazardous waste pursuant to 10 V.S.A. chapter 159 and the Vermont Hazardous Waste Management Regulations (VHWMR). The Program regulates the generation, transportation, treatment, storage, disposal, and other management of hazardous wastes, used oil, and universal wastes in the State, enabling the State to regulate hazardous waste from point of generation to its ultimate disposal (i.e., "cradle to grave"). "Used oil" and "Universal wastes" are subject to less stringent management standards that are included under the VHWMR. The less stringent requirements for used oil recognize the relative low hazard of this waste as well as its value for energy recovery (i.e., space heating) or reclamation. Universal wastes are relatively low-hazard wastes that are commonly generated by a wide variety of generator types (e.g., batteries, fluorescent lamps, cathode ray tubes).

Low Level Mixed Waste. Under its EPA-authorized RCRA Subtitle C program, Vermont has adopted EPA's regulations for low-level mixed waste (waste that is characterized as both low-level radioactive waste and a RCRA hazardous waste, or "LLMW"). These regulations (referred to as the "Mixed Waste Rule") is incorporated by reference in the VHWMR and is administered jointly between ANR and DOH under state law (10 V.S.A. § 6608b) and through a Memorandum of Understanding. The Mixed Waste Rule allows increased flexibility to licensed facilities that generate, treat, transport or dispose of LLMW in the State by exempting those facilities from RCRA hazardous waste management requirements under the VHWMR provided the LLMW is managed under Nuclear Regulatory Commission (NRC) requirements and certain other conditions are met. The two exemptions under the Rule allow facilities to store and treat LLMW and/or transport and dispose of the LLMW based on a single set of streamlined requirements instead of under two sets of federal regulatory requirements that would otherwise apply (i.e., the exemptions allow management of LLMW as low-level radioactive waste instead of as both low-level radioactive waste and hazardous waste). If at any time the facility ceases to meet the

conditions and requirements associated with either exemption, the facility must then manage the waste in accordance with both NRC requirements for the radioactive component of the waste and the VHWMR for the hazardous waste component of the waste.

Pesticides/Economic Poisons. The AAFM, through a Memorandum of Understanding with the ANR, regulates the management of hazardous waste pesticides, also referred to as economic poisons. Under 10 V.S.A. § 6608a, the Secretary of the AAFM is authorized and responsible to implement and enforce the provisions of 10 V.S.A, and all regulations, which relate to the management of waste or obsolete pesticides. For situations where a person generates or transports, or a treatment, storage, or disposal facility handles, both hazardous waste and waste pesticides/economic poisons, the Secretary of the AAFM and the Department of Environmental Conservation (DEC) determine, on a case-by-case basis, the party who shall serve as the state contact and coordinator for the implementation and enforcement of RCRA and VHWMR. The DEC inspects all permitted treatment, storage, and disposal facilities for the proper management of waste economic poisons. The AAFM inspects retail and use locations. The Secretary of the AAFM is responsible for initiating and completing enforcement actions relating to waste pesticides/economic poisons.

Summary of Chemicals/Substances Regulated:

Hazardous Waste. "Hazardous waste" is generally defined as "wastes or combination of wastes of a solid, liquid, contained gaseous, or semi-solid form, including those which are toxic, corrosive, ignitable, reactive, strong sensitizers, or which generate pressure through decomposition, or heat". Special nuclear, source, and by-product material is specifically excluded from the definition of "hazardous waste", and is therefore not regulated as such. The wastes that are subject to regulation as hazardous waste are identified under the VHWMR. To be regulated as hazardous waste under the VHWMR, wastes meeting the hazardous waste definition must either (1) be specifically "listed" as hazardous waste or (2) exhibit one of four "hazardous waste characteristics" of ignitability, corrosivity, reactivity or toxicity. Additionally, approximately 32 types of wastes are either categorically or conditionally exempt from regulation under VHWMR §§ 7-203 and 7-204. These include household waste, mining and processing wastes, hazardous waste containing radioactive waste, pesticidal wastes, and military munitions.

"Listed" hazardous wastes are identified under five distinct lists in Subchapter 2 of the VHWMR. The Secretary may add wastes to these lists when he or she determines that exposure to the waste may result in an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, taking into account such factors as the waste's toxicity, persistence, degradability, assimilation, concentration in tissue, and other factors demonstrating potential adverse effects on human health or the environment. An emerging contaminant that meets the general definition of "hazardous waste" and the criteria for listing additional wastes may be added as a "listed" hazardous waste under the VHWMR. For instance, the State listed certain PFOA and PFOS wastes as hazardous wastes in 2016 based on the factors referenced above. Despite the ability to list additional wastes for regulation, the listing process is generally perceived as burdensome, cumbersome, and ineffective at affecting some categories of hazardous substances, such as pharmaceuticals, to become regulated as hazardous waste when discarded. Additionally, it is difficult if not impossible to list and regulate a substance as a hazardous

waste where the potential risks of that substance are not fully understood (i.e. contaminants of emerging concern (CECs).

Each of the four hazardous waste characteristics are evaluated using specific testing methods (which are federally-required). While the methodologies for determining the hazardous waste characteristics of ignitability, corrosivity, and reactivity are generally appropriate, the testing method used to evaluate toxicity (the Toxicity Characteristic Leaching Procedure, or TCLP) is generally perceived as inadequate as it applies to a very limited set of specific contaminants and its ability to simulate leaching to environmental receptors is questionable.

Low Level Mixed Waste. The Mixed Waste Rule allows streamlined regulation of eligible LLMW by facilities that generate, treat, or handle LLMW pursuant to NRC requirements and other conditions of the Rule. LLMW is waste that is characterized by as both low-level radioactive waste and a RCRA hazardous waste.

Pesticides/Economic Poisons. Pesticide wastes and obsolete pesticide products are a listed hazardous waste under the current VHMWR (coded as VT06).

Summary of Reporting Requirements:

Hazardous waste. Hazardous waste generators, transporters and facilities that treat, recycle, store, or dispose of hazardous waste must obtain a permanent EPA ID number from ANR through submission of a Hazardous Waste Handler Site ID Form.

In addition to the initial notification that occurs through the Site ID Form, ANR's Hazardous Waste Program relies on the uniform hazardous waste manifest (shipping document) program to track most shipments of hazardous waste from point of generation to point of disposal and to assess hazardous waste tax under title 32 of the Vermont law. Manifests contain contact information for the generator, including the EPA identification number, a description of the waste and corresponding waste codes, the number of units or containers shipped, and the weight or volume of the waste.

Other reporting requirements include:

- Biennial reporting by Large Quantity Generators and treatment, storage, and disposal facilities (TSDFs): This federal reporting requirement provides information to EPA and ANR about types and quantities of wastes handled by facilities and methods of disposal utilized;
- Import/export reporting to EPA: This federal reporting requirement provides information to EPA (and countries to which waste is imported/exported) about the movement of such wastes;
- Notification of on-site treatment of hazardous waste by generators in tanks and containers: This Vermont requirement notifies the state of the types of hazardous wastes being treated on-site by generators and the treatment methods being used.
- Pre-closure notification: This Vermont requirement requires notification to the State when large and small quantity generators anticipate ceasing hazardous waste generation and/or management

activities and ensures that the facility is closed in a manner that is protective of human health and the environment.

Much of the information reported to the ANR, including manifest information, is available through ANR's Waste Management & Prevention Division website and the Environmental Research Tool (ERD). Other reported or facility information provided to the ANR is available for public inspection and copying pursuant to the Vermont Public Records law (1 V.S.A., subchapter 3).

RCRA facility information, including permitting and compliance information, is also available through EPA databases Envirofacts and ECHO.

Low Level Mixed Waste. Management of LLMW under the storage and treatment exemption of the Mixed Waste Rule requires notification to ANR by the facility of such management; notification must be made no later than 90 days of when a storage unit is first used to store exempt LLMW. Management of LLMW under the transportation and disposal exemption requires notification of ANR prior to the initial shipment of the waste from the facility to the LLRWDF. Additionally, LLMW that is transported to a designated disposal facility must be shipped on a manifest that complies with NRC manifest regulations.

Notification by a facility of waste management under the exemptions of the Mixed Waste Rule is available for public inspection and copying pursuant to the Vermont Public Records law (1 V.S.A., subchapter 3). Other records required to be maintained by the facility are not required to be reporting to ANR, and therefore not directly available to the public.

Pesticides/Economic Poisons. Waste pesticides/economic poisons are subject to the same reporting requirements as that of other hazardous wastes identified under the VHWMR. The AAFM also oversees grants and pays for waste pesticide collection programs.

Summary of Management Requirements:

Hazardous Waste. The VHWMR contains several sets of requirements for the management of hazardous waste, most of which mirror federal requirements.

Generators. Waste management and recordkeeping requirements for hazardous waste generators in VHWMR Subchapter 3 vary in stringency depending on the generator's status (large quantity, small quantity, or conditionally-exempt), which depends on the quantity and frequency of waste generation. In addition, generator facilities are required to perform closure once they cease hazardous waste generation activities, which requires removal of all hazardous waste to a designated facility; and decontamination of all structures, equipment, soil and debris to minimize or eliminate post-closure escape of hazardous waste constituents to the groundwater, surface waters, or the atmosphere.

Waste haulers. Transporters of hazardous waste are required to obtain a permit pursuant to 10 V.S.A. § 6607a and VHWMR Subchapter 4. Transporters that off-load hazardous waste that is "in transport" to "transfer facilities" are also subject to certain container storage and management standards in VHWMR

Subchapter 4, to ensure that releases of hazardous wastes do not occur during this period of temporary storage.

Treatment, storage, disposal facilities. TSDFs are required to obtain a permit, which ensures that hazardous waste is accepted and treated/stored/disposed in a manner that is protective of human health and the environment. VHWMR Subchapter 5 includes requirements for the design, construction, operation, maintenance, closure, and post-closure of TSDFs.

Used oil. The management of used oil is regulated under VHWMR Subchapter 8, which contains requirements for used oil generators, marketers, collection facilities, transporters, processors, aggregation points, and for burning used oil fuel for energy recovery.

Universal wastes. The management of universal wastes is regulated under VHWMR Subchapter 9; provisions of that subchapter require that handlers (i.e., universal waste generators, transporters, destination facilities) comply with streamlined management standards to ensure safe management and prevent releases of universal waste. There are also standards for the importers and exporters of universal wastes. Any person may petition ANR to add a hazardous waste or category of hazardous wastes as a universal waste provided certain criteria are met. A recent example in Vermont is when "postconsumer paint" was added as a category of universal waste.

Low Level Mixed Waste. Waste that is eligible under the storage and treatment exemption of the Mixed Waste Rule must be generated and managed under a single NRC license, and must be stored and treated in tanks or containers that comply with the requirements of the facility's NRC-issued license. Waste that is eligible under the transportation and disposal exemption of the Mixed Waste Rule must meet waste acceptance criteria of a Low Level Radioactive Disposal Facility (LLRWDF), and must also meet or be treated to meet applicable Land Disposal Restriction treatment standards. Additionally, the waste must be shipped on a manifest and be transported in accordance with NRC regulations to a LLRWDF for ultimate disposition.

Pesticides/Economic Poisons. In Vermont, waste pesticides/economic poisons are subject to the same hazardous waste regulations as all other hazardous wastes; the only difference is the primary agency responsible.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Hazardous Waste. ANR's hazardous waste program relies on compliance by regulated entities, and its provisions are aimed at tracking waste generation and management and at preventing releases through proper management. ANR monitors compliance with the VHWMR through facility inspections and review of required reporting: Vermont is required to inspect, on an annual basis, 20% of large quantity generators, 50% of its TSDFs, and conducts about 75 other inspections focusing on small quantity and conditionally exempt generators. Vermont's hazardous waste program is generally successful in bringing non-compliant facilities into compliance with the VHWMR within timelines required by EPA through use of these inspections and compliance assistance and educational materials. However, given

that the federal RCRA Subtitle C and Vermont hazardous waste programs are preventative in nature, and that a limited number of facility inspections are conducted on an annual basis, it is difficult to quantify compliance and avoided releases of hazardous constituents to the environment on a comprehensive scale.

ANR's program has limited ability to reduce threats posed by wastes that have not been identified (or "listed") as hazardous waste, wastes that are not managed properly, or from wastes that have been released into the environment. The program is also not effective in regulating contaminants of emerging concern as the process for listing new hazardous wastes and some of the methods for identifying hazardous waste characteristics are limited and cumbersome. In addition, there is often a significant lack of scientific knowledge about the risks that contaminants of emerging concern pose to human health and the environment. Finally, between existing exemptions and the historically slow and cumbersome listing process, the program only regulates a limited percentage of potentially hazardous industrial hazardous wastes generated. As a result, many wastes, like pharmaceutical wastes, are not regulated as hazardous wastes.

The Hazardous Waste Program is funded by a combination of federal (74%) and state funds (26%). While federal funds have fluctuated over the years, the program currently has sufficient funding (and staffing) to meet Hazardous Waste program goals.

Low Level Mixed Waste. The Mixed Waste Rule exemptions allow eligible LLMW to be managed as low-level radioactive waste under NRC requirements (provided certain conditions are met) instead of being managed under NRC requirements and the VHWMR. This streamlined approach to regulation of LLMW is protective of human health and the environment because management requirements for low-level radioactive waste are generally more stringent and protective than management requirements for non-radioactive hazardous waste. However, compliance with the provisions and conditions of the Mixed Waste Rule largely depend on self-reporting by the facility; there is otherwise no routine compliance reporting or additional inspection or enforcement authority provided to the ANR to ensure compliance. Once any noncompliance is reported by a facility, ANR may terminate the ability to manage LLMW under the specified exemption or require additional conditions to be met, but these abilities still rely upon the facility to self-report noncompliance.

Additionally, notification of intent to manage LLMW under the Mixed Waste Rule should be required to be submitted to other state and local entities for emergency and other planning purposes. Specifically, notification should be required to be provided to the DOH to assist in the Department's planning and other responsibilities under the Texas-Vermont Low Level Radioactive Waste Compact (Compact) pursuant to 10 V.S.A. chapter 162. The DOH calculates the fraction of Compact waste volume usage so associated costs are allocated to each specific Compact user on a volumetric basis. By rule, the DOH requires notice of all radioactive material transportation activities within the states, primarily as part of its preparedness for transportation-related radiological incidents.

Pesticides/Economic Poisons. The AAFM has primary authority to regulate waste pesticides/economic poisons and may use existing authorities to any address emerging chemicals of concern in pesticide products or waste. Generally, large manufacturers of pesticides accept returned products (i.e., managed

under the VHWMR as universal waste) as part of their stewardship programs if initiated by the AAFM, usually at no cost. After initial product registration, pesticides are reevaluated by EPA for both ecological and human health concerns. This is done on a minimum of a 15-year cycle, and can be done sooner at the request of states. Data call-ins, toxicity studies, cumulative environmental and human health modeling are all a part of these evaluations, so emerging concerns are identified early. The AAFM is currently working to enhance the inspection, manifest tracking, and data management portion of its hazardous waste program responsibilities with additional assignments to current staff. The AAFM relies upon the DEC program for guidance and assistance in technical areas.

VERMONT WASTE MANAGEMENT PROGRAMS

Resource Conservation and Recovery Act
Subtitle D/ Solid Waste Management Program

Statutory Authority: 42 U.S.C. § 6901 et seq; 10 V.S.A. chapters 159; 164, 164(A), 166, 168

Regulatory Authority: 40 C.F.R. Parts 239 – 279; Vermont Solid Waste Management Rules

Administering Agencies/Departments:

The Solid Waste Management Program (SWMP) within the Department of Environmental Conservation's (DEC) has been determined to be adequate by the EPA to administer the federal solid waste regulations under Subtitle D.

Overview of Regulatory Program:

The SWMP regulates the transport, storage, treatment and disposal of solid wastes, which are "any discarded garbage, refuse, septage, sludge from a waste treatment plant, water supply plant, or pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous materials resulting from industrial, commercial, mining, or agricultural operations and from community activities", although sludge from a waste treatment plan and septage are regulated by the Residual Waste and Emerging Contaminants Program.

The program prioritizes the reduction of the waste stream through recycling and reduction programs. Legislation such as the Universal Recycling Law (Act 148), extended producer responsibility programs and the Architectural Waste Recycling Law (Act 175) all serve to require end of life management that diverts waste away from landfill disposal. The following materials all have requirements imposed by the programs and laws referenced above requiring recycling: recyclables, food residuals, clean wood, yard wastes, paint, primary batteries, mercury bulbs, thermostats, electronics, asphalt shingles, drywall, scrap metal, plywood and oriented strand board. While these programs are mostly available statewide, the Architectural Waste Recycling Law only requires recycling by certain commercial projects with reasonable access to a recycling facility due to the limited number of these facility types across the State.

The inclusive nature of solid waste results in numerous substances being regulated by the program. The SWMP does ban the disposal of hazardous wastes in Vermont landfills and regulates the management of hazardous wastes that are exempt from the Vermont Hazardous Waste Management Regulations, namely household hazardous wastes and wastes generated by conditionally exempt generators of hazardous wastes. However, the management of large volumes and industrial hazardous wastes is largely different from to the Resource Conservation and Recovery Act Hazardous Waste Management Program, with the solid waste program managing nonhazardous industrial solid wastes and municipal solid wastes.

The Solid Waste Management Program regulations (the Vermont Solid Waste Management Rules, or VSWMR) require the management of solid wastes by methods that prevent and minimize risk to human health and safety and the environment. This is done through regulations that ban the disposal of certain wastes within landfills, require engineered systems, such as landfill liners, that prevent the migration or

discharge of materials off a solid waste management facility or simpler steps, such as required containerization or storage on impervious surfaces, as deemed appropriate. These types of management requirements are contained within the VSWMR and within conditions of a solid waste management facility permit.

Summary of Chemicals/Substances Regulated:

The program regulates the management of all solid wastes which can include a variety of chemicals and substances. The VSWMR do exempt a number of waste management activities as can be found within § 6-301(b).

Landfills are the most likely solid waste facility to serve as a source of contamination to the environment with potential to impact human health. Leachate produced by modern landfills is collected and managed at wastewater treatment facilities, while older, closed landfills discharge leachate directly to groundwater. Both active and closed landfills are required to maintain groundwater monitoring networks on the landfill property to track any potential migration of contaminants within the groundwater. These established networks provide the ability to test for the presence of contaminants within groundwater, as needed.

Summary of Reporting Requirements:

All facilities that store, treat or dispose of solid waste, including household hazardous wastes and universal wastes, must report the materials managed, quantities managed and the method of management (i.e. transfer to another facility or market, disposal etc.). Facilities that manage municipal solid waste must report on a quarterly basis to the program, while facilities that manage specific waste types (recycling drop-offs, compost facilities etc.), but not municipal solid waste, report on an annual basis. Amalgamated data is reported by the program annually in a diversion and disposal report, but all data, such as facility reports or material specific summaries, are available to the public digitally, upon request.

Summary of Management Requirements:

Facilities that store treat or dispose of solid waste are required to obtain a permit, which ensures that the materials managed are handled in a controlled manner that is protective of human health and safety and the environment.

The Solid Waste Management Rules prescribes requirements for the design, construction and operation of solid waste facilities and provides specific considerations for material types that have unique management concerns (e.g. household hazardous waste, universal wastes, freon-containing appliances etc.). Facilities are required to have established closure plans and closure funds in place for the final management of materials in the advent of facility closure.

Some materials are required to be recycled rather than disposed and facilities must manage them accordingly. Other materials are banned from disposal in Vermont's landfills (10 V.S.A.6621(a)) and cannot be included in the solid waste stream intended for disposal.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

For years, the Solid Waste Program has required collection events of Household Hazardous Waste ("HHW") and Conditionally Exempt Generator ("CEG") Waste to occur semiannually. These collections are a condition of approval for Solid Waste Management Entities ("SWME") and routinely occur throughout the state. The Solid Waste Program has encouraged the SWMEs to consider the creation of HHW/CEG Depots which operate on a year-round basis, and there are now 5 Depots located throughout the state. In addition to these activities the SW Program advocates for and has been successful in creating producer responsibility programs, including programs for the collection and recycling of electronic waste, batteries, paint, and mercury added lamps and thermostats. These Programs remove possibly hazardous materials from the waste stream. In addition, there are a number of landfill bans in place that keep hazardous materials out of the solid waste stream.

Modern landfills are designed and constructed to contain the waste materials placed within. The collection and testing of the resultant leachate allows the Program to identify threats from contaminants of emerging concern, however it would be preferred if contaminants did not end up in the landfill at all. Efforts to manage hazardous materials must be focused as far "upstream" as is possible. However, since all leachate is currently disposed for treatment at municipal wastewater treatment facilities, which are not designed to destroy many of the pollutants contained in leachate (many of which are considered to be CECs), rather than at treatment facilities dedicated to treatment of the generating landfill's leachate, it is inevitable that those pollutants remaining after treatment are either discharged to surface waters in the effluent stream or are partitioned to the sludge of which, in Vermont, about 50% is disposed back in the same landfill that originally generated the leachate. This closed loop system is not effective at preventing many of those contaminants from being discharged to the environment.

The Solid Waste's location within the Waste Management and Prevention Division ("WMPD") allows for a timely and robust response to release of a toxic substance, hazardous waste, or hazardous material. The WMPD also houses the RCRA Program, the Sites section, the Tanks Programs, and the Spill Response team. This level and breadth of experience and expertise has responded to releases in a manner that minimizes impacts to human health and the environment time and time again and is an effective scheme to manage these unfortunate events.

VERMONT WASTE MANAGEMENT PROGRAMS

Salvage Yard Program

Statutory Authority: 24 V.S.A. chapter 61, § 2248(b)

Regulatory Authority: Vermont Salvage Yard Rule

Administering Agencies/Departments:

The Agency of Natural Resources (ANR) has the regulatory authority to regulate salvage yards in Vermont. The Department of Environmental Conservation (DEC's) Waste Management Division implements its authority through regulation of the Salvage Yard Rule. Any generation or management of hazardous wastes, hazardous materials, and other regulated substances by salvage yards are also subject to other ANR regulations.

Overview of Regulatory Program(s):

Because of the significant threat to human health and environmental media posed by salvage yards and vehicle salvage operations, the legislature passed specific laws regarding the siting and operation of salvage yards to prevent contamination of the environment by waste gasoline, anti-freeze, motor oil, other vehicle fluids, and other hazardous wastes.

Salvage yards must obtain local approval (a Certificate of Approved Location) from the municipality in which they are located or proposed to be located, and must also receive a permit from the State of Vermont in order to operate in the State. The Salvage Yard Program regulates the siting and operation of salvage yard on behalf of the State. The Program reviews application and issues/re-issues salvage yard facility permits, conducts facility inspections, and enforces applicable regulations of the Salvage Yard Rule. The Program also holds trainings and maintains technical assistance materials for use by salvage yards.

Permitted salvage yards are inspected periodically (roughly every three years) to ensure compliance with permit and rule provisions. This includes inspection of hazardous waste storage, dismantling, and car-crushing areas. In addition to inspection of permitted salvage yards, the Program investigates complaints of unpermitted salvage yards.

Summary of Regulated Substances:

Salvage yards that generate hazardous wastes as part of their operations (i.e., through vehicle crushing and fluid recovery) are a sub-set of hazardous waste generators and are subject to generator management and reporting requirements of the Vermont Hazardous Waste Program (see the RCRA Subtitle C Hazardous Waste Program Summary in Appendix B for reference to those requirements), including requirements specific to the management of used oil.

Summary of Reporting Requirements:

Salvage yards that generate hazardous wastes are subject to the notification requirements and hazardous waste disposal requirements of the hazardous waste program. This includes the use of hazardous waste manifest for the shipment of hazardous waste if the salvage yard is a large or small quantity generator.

Summary of Management Requirements:

The Salvage Yard Regulations and the Vermont Hazardous Waste Management Regulations contains several sets of requirements for the management, storage, and disposal of hazardous waste, most of which mirror federal requirements (see the RCRA Subtitle C Hazardous Waste Program Summary in Appendix B).

In addition to hazardous waste management requirements, the Salvage Yard Regulations require record-keeping of vehicle throughput, and planning requirements for the removal of hazardous waste, used oil, and tires if certain regulatory thresholds set for each are exceeded.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

ANR's salvage yard program relies on compliance by regulated entities, and its provisions are aimed at tracking waste generation and management and at preventing releases through proper management. ANR's program has limited ability to reduce threats posed by wastes that have not been identified (or "listed") as hazardous waste, wastes that are not managed properly, or from wastes that have been released into the environment.

ANR monitors compliance with the Salvage Yard Rule through facility inspections and review of required reporting. Vermont's salvage yard program is generally successful in bringing non-compliant facilities into compliance with the Rule. However, given that the program is preventative in nature, and that a limited number of facility inspections are conducted on an annual basis, it is difficult to quantify compliance and avoided releases of hazardous constituents to the environment on a comprehensive scale.

VERMONT WASTE MANAGEMENT PROGRAMS

Storage Tank Program

Regulatory Program: Vermont Storage Tank Program

Statutory Authority: 42 U.S.C. § 6991; 10 V.S.A. chapter 59

Regulatory Authority: 40 C.F.R. Parts 110, 112, 280 – 281;
10 V.S.A. chapter 59;
Vermont Underground Storage Tank Rules;
Vermont Aboveground Storage Tank Rules

Administering Agencies/Departments:

The State of Vermont has been authorized to administer the federal Underground Storage Tank (UST) Program in lieu of the Environmental Protection Agency (EPA). The Tanks Program within the Waste Management & Prevention Division within the Department of Environmental Conservation (DEC) administers the UST and the Aboveground Storage Tank (AST) programs.

Overview of Regulatory Program(s):

The Tanks Program regulates both ASTs and underground storage tanks USTs, and administers sets of regulations that address each. The UST rules are intended to protect public health and the environment by establishing standards for the design, installation, operation, maintenance, monitoring and closure of underground storage tanks. They apply to persons who own or operate, install, remove, repair, or test underground storage tank systems. The program permits commercial USTs, and receives notification for heating oil tanks with capacity greater than 1,100 gallons at public buildings. For permitted tanks, the program reviews applications for new installations and issues construction permits; after installation, the program reviews installation documentation and issues operational permits (up to 5 years). The program conducts inspections of permitted facilities at minimum once every three years, reviewing tank system features and required operational records. In addition, owners of permitted tanks are required to self-inspect and report compliance annually.

The AST Rules are intended to protect public health and the environment by: (1) Establishing standards for the design and installation of new aboveground storage tank systems and substantial alteration to existing aboveground storage tank systems; and (2) Establishing standards for the design, installation, and operation of new bulk tank systems and substantial alteration of existing bulk tank systems.

Summary of Regulated Substances:

The Program primarily regulates petroleum fuels and hazardous chemicals that are stored in underground storage tanks at commercial and industrial facilities. This includes gasoline and diesel motor fuels; kerosene, #2, #4, and #6 heating oils; and hazardous process chemicals (such as solvents used at a paint manufacturing facility). USTs at farms and residences are not regulated by the program.

Summary of Reporting Requirements:

Permit applications are the primary form of system reporting. The application details the size of the tank, location, and other features such as dispensers, piping runs, etc. Once installed, there are no reporting requirements except for facility upgrades (permit required) and tank removal/closure in place.

As noted above, facility owners are required to self-inspect and report compliance annually.

All releases including spills and overfills, that meet any of the following criteria are required to be immediately reported to the Agency: (1) a release of heating fuel, motor fuel, or used oil that exceeds 2 gallons, (2) a release of heating fuel, motor fuel, or used oil that is less than or equal to 2 gallons and poses a potential or actual threat to human health or the environment; or (3) a release of heating fuel, motor fuel, or used oil that equals to or exceeds its corresponding reportable quantity under CERCLA as specified under 40 CFR § 302.4.

Any person required to report shall report any suspected release to the Secretary immediately upon discovery.

Summary of Management Requirements:

The UST Rules contains requirements for the management of USTs, most of which mirror federal requirements. Specific requirements for operators of USTs are set forth in subchapter 3. Operators are required to conduct weekly leak detection tests of the UST system; monthly facility inspections; inventory monitoring; and checks for water in the tank. Some tank systems require periodic testing of system components (annual basis for some components, longer periods for other components). In addition, facility operators are required to complete UST system training (with passing of a test) and re-train and certify every two years.

The AST Rules contain requirements for the installation of heating fuel tanks. The Rules do not contain requirements for tank operation or management once installed. ASTs at bulk facilities and public buildings are subject to permitting from the Department of Public Safety.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

ANR's Tanks Program relies on compliance by regulated entities, and its provisions are aimed at the prevention of releases, or the timely detection of releases, through proper operations and management. Given that the tanks program is preventative in nature, and that a limited number of facility inspections are conducted on an annual basis, it is difficult to quantify compliance and avoided releases of hazardous constituents to the environment on a comprehensive scale. ANR's program has limited ability to reduce threats posed by wastes that have not been identified (or "listed") as hazardous waste, wastes that are not managed properly, or from wastes that have been released into the environment.

VERMONT WASTE MANAGEMENT PROGRAMS

Toxics Use Reduction and Hazardous Waste Reduction Program (Act 100)

Statutory Authority: 10 V.S.A Chapter 159, subchapter 002, §§ 6623 – 6632

Regulatory Authority: No rules have been adopted to implement this program.

Administering Agencies/Departments:

The Secretary of the Agency of Natural Resources (ANR) is required to establish a toxics use reduction and hazardous waste reduction program, coordinate activities of all state agencies with responsibilities and duties relating to toxics use and hazardous waste, and promote coordinated efforts to encourage reductions in the use of toxics and the generation of hazardous waste. This program is currently administered by the Environmental Assistance Office within the Vermont Department of Environmental Conservation.

Overview of Regulatory Program:

The intent of the program is to encourage reduction of toxic substances and reduce the generation of hazardous waste whenever technically and economically practicable, without shifting risks from one part of a process, environmental medium or product to another. The specific goals of the program are to: (1) eliminate, or reduce the use of hazardous, particularly toxic, materials wherever feasible; (2) reduce the generation of hazardous waste; (3) reduce the release into the environment of chemical contaminants which have adverse and serious health or environmental effects; and (4) document hazardous waste reduction and toxics use reduction information and make that information available to State and local government and the public.

To achieve the stated goals, the law requires certain facilities to develop a program for toxics use reduction and/or hazardous waste reduction or generation of hazardous waste. Implementation of reduction plans is not required by the law, however the act of going through the planning process alone is an important exercise that provides the facility with a picture of their own toxics use and waste generation and ways to reduce these materials, and often leads to changes by implementing the plan.

The law addresses threats to human health and the environment by requiring facilities to look for opportunities to reduce use of the toxics that they have in the greatest volume and the hazardous wastes that they generate in larger quantities.

Summary of Chemicals/Substances Regulated:

The substances regulated under the program include toxic substances or "toxics" as listed pursuant to the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Section 313 (the most current list of toxic substances can be found here: https://www.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals). The program also encompasses hazardous wastes that are defined in and otherwise subject to the Vermont Hazardous Waste Management Regulations (see the RCRA Subtitle C Hazardous Waste Program Summary in Appendix B). ANR may add or remove any toxic substance or

hazardous waste from regulation under the program but such action must be based on findings with respect to toxicity, potential impact on public health and the environment, and the potential for use reduction or waste reduction of the toxic substances or hazardous waste.

Facilities that are subject to the pollution prevention planning requirements of the program are those using toxic substances and/or generating hazardous wastes in amounts that exceed certain threshold values. These include "large users" of toxics, as well as facilities that generate greater than 2,640 pounds of hazardous waste (or 26.4 pounds of acute hazardous waste) per year. A "large user" means a facility with 10 or more full-time employees, that is in Standard Industrial Classification (SIC) 20 – 39 and that: (A) manufactures, processes or otherwise uses, exclusive of sales or distribution, more than 10,000 pounds of a toxic substance per year; or (B) manufactures, processes or otherwise uses, exclusive of sales or distribution, more than 1000 pounds but less than 10,000 pounds of a toxic substance per year if that substance accounts for more than 10% of the total toxic substances used at the facility during the year.

Facilities for which the Secretary determines that no source reduction opportunities exist may be exempted from the planning requirements under 10 V.S.A. § 6625(d).

This regulatory program does not directly address contaminants of emerging concern, but it relies on two other regulatory programs (SARA Title III, Section 313 and RCRA/Vermont Hazardous Waste Program) to identify the substances that make a facility subject to regulation, so the response to contaminants of emerging concern mirrors the response of those two regulatory programs.

Summary of Reporting Requirements:

Facilities subject to the toxics use and/or hazardous waste reduction planning requirements are required to submit plans or plan summaries to ANR every three years and to annually submit progress reports. The plans must include a list of the toxic substance(s) that exceed the planning threshold and/or the hazardous wastes routinely generated by the facility. Facilities have the option to submit the entire plan or a summary of the plan that includes a cover sheet, the management policies on pollution prevention and employee training related to pollution prevention, and a summary of pollution prevention performance goals.

Pollution prevention plans are specifically exempted from the definition of a public records (see 10 V.S.A. §6628(a)) and are therefore not subject to public inspection and copying under the Vermont Public Records law. However, facilities are also required to develop and submit plan summaries to include methods to be taken by the facility to reduce toxics use and waste generation over the next three years, a list of toxic substances and hazardous wastes that are covered by the plan, and a statement of the facility's policy and commitment regarding toxics use and hazardous waste reduction. Plan summaries are public records and are available to the public through a public records request.

Annually, each facility subject to the planning requirement must prepare and submit a hazardous materials management performance report, now known as an Annual Progress Report. The law specifies that the report should be submitted to the House and Senate Committees on Natural Resources

and Energy, however it appears that the reports have been submitted to the ANR Secretary since 1993. The reports are submitted on paper and are available to the public through a public records request.

Limited data from the plans and annual progress reports is maintained by ANR in a database (the "P2Planner MS Access Database"); this data includes information regarding completion of plans and progress reports, fees received, total pounds of toxics or hazardous waste managed, pounds of toxics or hazardous waste reduced, and toxics use reductions methods used. The P2Planner database is not accessible on a public platform.

Summary of Management Requirements:

This program does not prescribe management of subject toxic substances and hazardous wastes. Such substances and wastes are otherwise subject to other Vermont laws and regulations, such as those administered by the Vermont RCRA Subtitle C Hazardous Waste Program.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

It is difficult to measure this program's effectiveness in preventing releases of toxic substances, hazardous wastes, or hazardous materials. Facilities that have been planners as required by this statute and that have implemented planning measures have reduced hazardous waste generated by 2.3 million pounds and toxics used by 1.4 million pounds since 2006.

The program is currently staffed by less than 1 full-time employee, which makes it difficult to effectively administer the requirements of the program. Additionally, lack of staff administration makes enforcement of the program's planning requirements extremely difficult: in fact, it is likely that there are more facilities that are required to adhere to the planning requirements of the program that are not meeting the requirements of the statute.

VERMONT CHEMICAL DISCLOSURE PROGRAM FOR CHILDREN'S PRODUCTS (Act 188)

Statutory Authority: 18 V.S.A. chapter 38A

Regulatory Authority: Chemicals of High Concern in Children's Products Rule

Administering Agencies/Departments:

The Vermont Department of Health (VDH) has the authority to collect chemical disclosures, disclose such notices, and adopt rules for purposes of implementing, administering, or enforcing the requirements of Act 188 (of 2014). The Act is administered by the Chemical Disclosure Program within the VDH. Rulemaking by VDH may address when manufacturers must provide notice of listed chemicals in children's products, what the notice must contain, and reporting ranges. Substances may be added or removed from the statutory list of Chemicals of High Concern to Children ("CHCC") via rulemaking. In addition, rulemaking may require labeling of a product containing a listed chemical. Lastly, rules may prohibit the children's product containing the chemical of high concern to children from sale, offer for sale, or distribution in the State. The Secretary of the Agency of Natural Resources (ANR) is required to be consulted prior to any rulemaking by the Commissioner of Health.

Overview of Regulatory Program:

The purpose of Act 188 Chemical Disclosure Program is to require that manufacturers who use CCHC in children's product disclose information about those chemicals to the VDH and ensure that the collected information is made available to consumers. "Children's products" for purposes of the law are consumer products that are marketed for use by, marketed to, sold, offered for sale, or distributed to children in the State of Vermont. Through time, such information may also be used to understand exposures, and exposure pathways, such that there will be sufficient evidence to label the presence of certain chemicals or prohibit their use in consumer goods.

Specific regulated CHCC are listed in 18 V.S.A. § 1773. The Act also created the Chemicals of High Concern to Children Working Group within the VDH to recommend to the Commissioner of Health whether rules should be adopted to regulate the sale or distribution of a children's product containing a chemical of high concern to children. The Working Group is also charged with reviewing no fewer than two chemicals on a biennial basis for possible inclusion in the § 1773 list.

The program addresses threats to human health by collecting notices as described above and disclosing them to the public. In the coming years, the VDH anticipates offering a consumer-friendly platform for the disclosure of such information; and as described, plans to review evidence that may lead to the labeling or prohibition of certain chemicals.

Summary of Chemicals/Substances Regulated:

The current list of CHCC (at 18 V.S.A. § 1773) includes the following:

Formaldehyde Aniline

N-Nitrosodimethylamine
Benzene
Vinyl chloride
Acetaldehyde
Methylene chloride
Carbon disulfide
Methyl ethyl ketone
1,1,2,2-Tetrachloroethane
Tetrabromobisphenol A
Bisphenol A
Diethyl phthalate
Dibutyl phthalate
Di-n-hexyl Phthalate
Phthalic anhydride
Butyl benzyl phthalate (BBP)
N-Nitrosodiphenylamine
Hexachlorobutadiene
Propyl paraben
Butyl paraben
2-Aminotoluene
2,4-Diaminotoluene
Methyl paraben
p-Hydroxybenzoic acid
Ethylbenzene
Styrene
4-Nonylphenol; 4-NP and its isomer mixtures, including CAS 84852-15-3, CAS 25154-52-3
para-Chloroaniline
Acrylonitrile
Ethylene glycol
Toluene
Phenol
2-Methoxyethanol
Ethylene glycol monoethyl ester
Tris(2-chloroethyl) phosphate
Di-2-ethylhexyl phthalate
Di-n-octyl phthalate (DnOP)
Hexachlorobenzene
3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine
Ethyl paraben
1,4-Dioxane
Perchloroethylene
Benzophenone-2 (Bp-2); 2,2',4,4'-Tetrahydroxybenzophenone
4-tert-Octylphenol; 1,1,3,3-Tetramethyl-4-butylphenol
Estragole
2-Ethylhexanoic Acid
Octamethylcyclotetrasiloxane
Benzene, pentachloro
C.I. Solvent Yellow 14
N-Methylpyrrolidone
2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether; BDE-209
Perfluorooctanyl sulphonic acid and its salts; PFOS
Phenol, 4-octyl-
2-Ethyl-hexyl-4-methoxycinnamate
Mercury & mercury compounds including methyl mercury (22967-92-6)
Molybdenum & molybdenum compounds
Antimony & Antimony compounds
Arsenic & Arsenic compounds. including arsenic trioxide (1327-53-3), dimethyl arsenic (75-60-5)
Cadmium & cadmium compounds
Cobalt & cobalt compounds
Tris(1,3-dichloro-2-propyl)phosphate
Butylated hydroxyanisole; BHA
Hexabromocyclododecane
Diisodecyl phthalate (DIDP)
Diisononyl phthalate (DINP)

Chemicals not on this list are not covered by the program's reporting requirements. Chemicals in children's products that are manufactured, stored in, or transported through Vermont solely for use or sale outside the State are not covered by program requirements.

The VDH has authority to add additional chemicals to the § 1773 list for regulation under the program if the chemical is determined, on the basis of the weight of credible, scientific evidence, to have met the following criteria: (1) that an authoritative governmental entity or accredited research university has demonstrated that the chemical harms the normal development of a fetus; causes cancer, genetic

damage, or reproductive harm; disrupts the endocrine system; damages the nervous system, immune system, or organs or causes other systemic toxicity; or is a persistent bioaccumulative toxic, and (2) that the chemical has been found through biomonitoring to be present in human blood, umbilical cord blood, breast milk, urine, or other bodily tissues or fluids; through sampling and analysis to be present in household dust, indoor air, drinking water, or elsewhere in the home environment; or through monitoring to be present in fish, wildlife, or the natural environment.

Some contaminants of emerging concern are already on the CHCC list. Other contaminants of emerging concern that meet the criteria for inclusion identified above may be considered for addition to the list.

Summary of Reporting Requirements:

Manufacturers are required to report the use of CHCCs in children's products that are marketed for use by, marketed to, sold, offered for sale, or distributed to children in the State of Vermont. Manufacturers must use an online reporting system to provide the following information to the VDH for each chemical covered by the law:

- Chemical Name and CAS Number;
- Function (the chemical's function in the product);
- Component (the component of the product that contains the CHCC);
- Brick (the Global Product Classification product description);
- Concentration (reported in ranges of parts per million); and
- Brand Name/Product Model Excel Template (manufacturers provide the brand name and product model by filling out an excel template with two columns).

The chemical data are saved in an online database and are exported and maintained by Chemical Disclosure Program staff. The information is made publicly available through the program website in the form of spreadsheet (Excel) files that can be downloaded by the public. There are two spreadsheet files: (1) Function Set Data (includes chemical name, function, component, brick, and concentration); and (2) Brand Name/Product Model Data (includes chemical name, brand name, and product model).

Summary of Management Requirements:

Section 1775(e) of Title 18 provides that manufacturers are exempt from the requirements of Act 188 for CHCCs present in their products as contaminants if, during manufacture of the children's product, the manufacturer was implementing a manufacturing control program (i.e. a program that includes industry best practices for the minimization of a chemical in a product), and the manufacturer exercised due diligence to minimize the presence of the contaminant in the children's product.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The Chemical Disclosure Program under Act 188 addresses threats to human health by providing data on CHCCs in children's products to the public. Consumers may choose not to purchase products containing a chemical of high concern based on the information about the chemicals that is required to be reported and made available to the public. Manufacturers may use less toxic chemicals, or unlisted chemicals so as to fall outside the scope of the Act. The program does not have a mechanism to prevent releases of toxic substances, hazardous wastes, or hazardous materials.

At this time, the program is adequately staffed to meet the statutory and regulatory purpose. To offer a consumer-friendly, including a mobile application, additional funds will be required.

VERMONT PESTICIDE CONTROL PROGRAM

Statutory Authority:
7 U.S.C. § 136 et seq (FIFRA);
21 U.S.C. § 301 et seq. (FFDCA);
Public Law 104-170 (FQPA);
6 V.S.A. Chapters 81 & 87

Regulatory Authority:
40 CFR 156 (Labeling);
40 CFR 157 (Packaging);
40 CFR 170 (Worker Protection Standard);
Vermont Control of Pesticide Regulations

Administering Agencies/Departments:

Under the Federal Insecticide, Fungicide, Rodenticide Act, the Vermont Agency of Agriculture, Food & Markets (AAFM) is the agency responsible for pesticide regulation in Vermont. As such the AAFM has primacy and this is not a federally-delegated program.

Overview of Regulatory Program:

The AAFM pesticide regulatory program is responsible for the control of all pesticides sales, distribution, use, storage, recordkeeping, applicator certification and training, and disposal in the state. The Agency is also responsible for enforcing food tolerances, worker protection regulations and production in Vermont. All pesticides are reviewed and registered at the federal level by the U.S. Environmental Protection Agency (EPA). The EPA is required to review all pesticides for two criteria: (1) any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide, or (2) a human dietary risk from residues that result from a use of a pesticide in or on any food inconsistent with the Federal Food, Drug, and Cosmetic Act (FFDCA). During pesticide registration, registrants provide data which are reviewed against the above criteria. Ecological and human health assessments, including cumulative assessments, are required on all pesticides. To comply with the Food Quality Protection Act (FQPA) a federal review of every pesticide was concluded in 2008. Since 2008, all pesticides are now reevaluated on a minimum of a 15-year cycle.

The AAFM further registers and regulates pesticides. All products are registered in-state and evaluated for additional state requirements. Applicators, workers, distributors, producers and homeowners are subject to Vermont's pesticide regulations.

Summary of Chemicals/Substances Regulated:

The AAFM has authority over any pesticide, or product/entity making a pesticide claim. Pesticides are defined as (1) any substance produced, distributed, or used for preventing, destroying, or repelling any insects, rodents, nematodes, fungi, weeds, or other forms of plant or animal life or viruses, except viruses on or in living man or other animals, which the Secretary shall declare to be a pest; and (2) any substance produced, distributed, or used as a plant regulator, defoliant, or desiccant.

The Agency has the authority to regulate best management practices for “treated articles”, which are exempt from pesticide regulation at the federal level. A treated article is an item which is treated with a pesticide to protect the item from pests (*e.g.*, treated wood products, where the application of chemicals protects the wood from rot). The Agency further requires the registration of pesticides that are not required to be registered at the federal level. These are “minimum risk pesticides”. Registration requires strict compliance to allowed chemical inputs and labeling of these products. The Agency conducts routine environmental monitoring, and responds to all complaints of misuse, tolerance exceedances, unsafe worker conditions and other concerns about product use and exposures. From these pathways the program identifies areas of concern for further investigation. If a chemical is identified as posing an unacceptable risk based on the registration criteria, the Agency can take steps to restrict sales and use or can cancel sales and use in the state. Some options available to the Agency include increased inspection and enforcement, increased restrictions on sales and use of certain products (e.g., products made available only to certified applicators), require permits for treatment (rights-of-way) or a refusal to register a product in Vermont.

Summary of Reporting Requirements:

Certain types of certified pesticide applicators (those applying commercially, for the government or on their employer’s property), are required to report all pesticides used annually, by county of use. This information is tabulated and put on the Agency’s web site. Private applicators (those growing an agricultural commodity on their own property, farmers, nursery growers) are not required to report use, however pesticide dealers that sell to private applicators are required to report sales information. The sales information is used as a surrogate data point for private applicator use. All required records of use must be kept for two years. Pesticide dealers that sell restricted use pesticides must report a summary of sales of all products.

Summary of Management Requirements:

All pesticides and pesticide activities are managed under the Agency’s pesticide program. This includes, registering products; testing, training and certifying applicators; protecting workers; recordkeeping; storage; disposal; sales; and production.

Products & Sales: In Vermont products are classified into three types: restricted use, controlled sale and homeowner. To sell restricted use or controlled sales, a full-time employee of the establishment must become a licensed dealer. Homeowner-only products can be sold in any retail outlet that has paid a fee. All sales outlets are required to meet storage and disposal requirements.

Applicators: Applicators that apply any pesticide on the property of another (for hire) are required to become commercial applicators, passing a minimum of two exams and maintaining training hours. Applicators that are applying controlled sale or restricted use products on the property of their employer are also required to pass a minimum of two exams and maintain training hours. Private applicators, those growing an agricultural commodity on their own property, farmers, nursery growers, and using restricted use products are required to be certified, taking an exam and maintain training hours.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The pesticide program, despite its small size, has extensive experience in regulating the many industries that fall under its jurisdiction: agriculture, turf/landscape, ornamentals, applications to water, right-of-way vegetation, structural and food processors, mosquito control, cooling towers and microbiological control. When an issue arises, whether a new concern or improper use, the program has the tools required to ameliorate the problem. As the Agency is the primary stand-alone regulator for pesticides in Vermont, there is very little duplication of efforts. The principal efforts of the pesticide program are focused on the proper use, protection of workers, the public and the environment from pesticides. Four field agents cover the entire state. Although required by statute and provided annually on our website, the Agency recognizes a lack of data collation and presentation in a way that is meaningful to the public. This is an area the program acknowledges is understaffed and underused, as the public has an increasing desire to know more, these weaknesses have been highlighted.

VERMONT HAZARD COMMUNICATION STANDARD

Statutory Authority: 21 V.S.A. subchapters 4, 5 (§§ 201 – 232)

Regulatory Authority: 29 C.F.R. 1910.1000 (Permissible Exposure Limits);
29 C.F.R. 1910.1200 (Hazard Communication Standard)

Administering Agencies/Departments:

The Vermont Occupational Safety and Health Administration (VOSHA) within the Division of Workers Compensation and Safety of the Vermont Department of Labor is charged with enforcement of requirements based on the authorities listed above. Project WorkSAFE provides assistance to businesses in compliance.

Overview of Regulatory Program(s):

Vermont's statutory authority to administer this program is contained in 21 V.S.A, §§ 201 – 232. Under this law, VOSHA conducts workplace inspections, issues citations and penalties, and provides administrative and judicial review processes for employers seeking to contest citations and/or penalties. Title 21 V.S.A. § 231 prohibits employers from discriminating against workers for exercising their rights under VOSHA's occupational safety and health statutes, and authorizes the investigation and prosecution of complaints of discrimination. Section 232 provides an express private right of action for employees who believe discrimination or retaliation has occurred.

VOSHA has been administered by the Vermont Department of Labor, Division of Workers' Compensation and Safety since July 1, 2005. The Vermont Department of Labor is the enforcing agency for the program. The Commissioner of Labor has the authority to issue safety and health citations, and is the program's state designee. The program has five field offices in the State. The permissible exposure limits (PELs) enforced by VOSHA are those issued by Federal OSHA in 1988 and but were subsequently overturned. They are considerably stricter than OSHA's current PELs. Construction, manufacturing, transportation and warehousing, wholesale trade, and healthcare are the State Plan's high-hazard targeted industries. To ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to workers. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of the following information:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers;
- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.

Summary of Regulated Substances:

The following substances are regulated under this program:

Hazardous chemicals: any chemical that is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified.

A chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A to §1910.1200 (Health Hazard Criteria).

Mixtures: a combination or a solution composed of two or more substances in which they do not react.

A substance that has a physical hazard, a chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. See Appendix B to §1910.1200 (Physical Hazard Criteria).

Summary of Reporting Requirements:

The Hazard Communication Standard (HCS) is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This update to the Hazard Communication Standard (HCS) will provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and safety data sheets. This update will also help reduce trade barriers and result in productivity improvements for American businesses that regularly handle, store, and use hazardous chemicals while providing cost savings for American businesses that periodically update safety data sheets and labels for chemicals covered under the hazard communication standard.

Summary of Management Requirements:

OSHA originally published the HCS in 1983 which covered manufacturing sectors only. Due to court rulings, the scope of the HCS was expanded on August 24, 1987, to cover all industry sectors. On February 9, 1994, OSHA published the final rule (59 Fed. Reg. 6126); included were minor changes and technical amendments to clarify the standard's requirements. An update to the HCS, to align it with the United Nations (UN) Globally Harmonized System of Classification and Labelling of Chemicals (GHS Revision 3, 2009), was published in the Federal Register on March 26, 2012 (hereinafter known as HCS 2012). The update includes new hazard classification requirements, changes in labeling requirements, and a standard format for SDSs. HCS 2012 has also helped to align OSHA with the U.S. Department of Transportation (DOT) labeling requirements. OSHA's position is that state standards can be enforced only under the auspices of an OSHA-approved State plan. Community right-to-know laws are outside the jurisdiction of OSHA and are not affected by this position. Inquiries regarding preemption that require in-depth knowledge of this subject shall be referred through the Directorate of Enforcement Programs to the Directorate of Cooperative and State Programs for response.

All employers with employees who are or are potentially exposed to hazardous chemicals known to be present in their workplaces must develop, implement, and maintain at each workplace a written hazard communication program that includes labeling and other forms of warning (f), safety data sheets (g), and training (h). This also includes Chemical Inventory, under section (e)(1)(i).

The inventory must have a product identifier for each chemical known to be present that aligns with the SDS and label. The inventory can be for the entire facility or for individual work areas; and must include all chemicals present (even if the chemicals are stored/not in use).

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

VOSHA has a program manager a compliance chief, and eight compliance safety and health officers (CSHOs) who inspect Vermont employers to document compliance with VOSHA regulations. Health and Safety inspections are randomly scheduled and are based on injury and illness rates derived from the annual BLS Survey of Occupational Injuries and Illness. Inspections are also scheduled based on complaints and referrals, deaths, and catastrophes. Funding is from a federal OSHA grant that covers fifty percent of the operating costs and the State funds the remaining fifty percent. Not all inspections review the requirements of the Hazard Communication Program. This is due to inspection procedures and the discipline of the CSHOs, which is based on the inspector being a safety officer or an Industrial Hygienist. An Industrial Hygienist is required to have a four-year degree in the sciences that includes a background in chemistry. Federal funding has not increased over the past few years to cover expenses and this is a hardship to the program.

WorkSAFE is the business assistance program for OSHA. It is separately-managed, free, and confidential to Vermont employers. The program has a working Program Manager and a Chief, both of whom are Industrial Hygienists. Additionally, two consultants cover safety and health issues. All staff in this program must have at least a four-year degree. Industrial Hygiene staff must have an academic background in chemistry, biology, and toxicology or physiology. The WorkSAFE program has seen flat funding from federal OSHA for almost a decade, causing budget hardships. Federal funding covers about seventy percent of the operational costs. However, the program has been able to maintain all grant goals through smart budgeting.

All staff competently review hazardous chemicals and related programs as the hazard communication program. This program also conducts outreach training and education. The hazard communication standard is often found to be deficient during onsite reviews. Companies are obligated to update and develop such programs for the evaluation. Employers that are unable to develop a hazard communication program due to lack of knowledge or ability will result in, some cases depending on time restraints, the WorkSAFE program actually develops the program for their use.

VERMONT EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW (EPCRA)

Statutory Authority: 42 U.S.C. §§ 11000-11050 et seq.

20 V.S.A. §§ 2, 3a, 6, 30 – 33, 39

Regulatory Authority: 40 C.F.R. Parts 370 – 372

Administering Agencies/Departments:

The Vermont State Emergency Response Commission (SERC) has been authorized to administer the federal Emergency Planning and Community Right-to-Know (EPCRA) regulations in lieu of the Environmental Protection Agency. Agencies represented on the SERC are:

- Agency of Natural Resources
- Agency of Transportation
- Agency of Agriculture, Food, and Markets
- Department of Health
- Department of Labor
- Department of Public Safety

Overview of Regulatory Program(s):

The SERC adopts rules necessary for the implementation of EPCRA and for the reporting of hazardous chemicals or substances, including setting minimum limits on the level of hazardous chemicals to be reported; designates and appoints local emergency planning committees (LEPCs); reviews and comments on the development and implementation of local emergency response plans by LEPCs, and provides assistance to those committees in executing their duties.

The SERC also reviews and comments on the comprehensive state Emergency Operations Plan and LEPC response plans; meets with interested parties, which may include representatives of the carrier industry shippers, and state and local agencies, having an interest, responsibility, or expertise concerning hazardous materials; and ensures that a state plan will go into effect when an incident occurs involving the transportation of hazardous materials among other duties.

Summary of Regulated Chemicals:

Over 10,400 hazardous chemicals are required to be reported on annually under EPCRA. "Hazardous chemical" means any chemical that is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified. Hazardous chemicals do not include the following:

- any food, food additive, color additive, drug, or cosmetic regulated by the Food and Drug Administration;
- any substance present as a solid in any manufactured item to the extent exposure to the substance does not occur under normal conditions of use;

- any substance to the extent it is used for personal, family, or household purposes, or is present in the same form and concentration as a product packaged for distribution and use by the general public;
- any substance to the extent it is used in a research laboratory or a hospital or other medical facility under the direct supervision of a technically qualified individual; and
- any substance to the extent it is used in routine agricultural operations or is a fertilizer held for sale by a retailer to the ultimate customer

Summary of Reporting Requirements:

Reporting requirements for EPCRA can be grouped into four major provisions:

- Emergency planning;
- Emergency release notification;
- Hazardous chemical storage reporting requirements; and
- Toxic chemical release inventory.

Information collected from these four requirements enables the SERC and local governments to develop a broad perspective of chemical hazards for the entire community, as well as for individual facilities.

EPCRA also requires that the SERC and all LEPCs ensure the following documents be made available to the public:

- Chemical Emergency Response Plans
- Safety Data Sheets (SDS)
- Follow-Up Emergency Notice
- Hazardous Materials Release & Inventory Reports (Tier II Forms)

Summary of Management Requirements:

Annually, the facility owner/operator must provide information, including SDSs, on the inventory of each hazardous chemical used or stored at the facility that meets the threshold as identified by the SERC. This information is provided to the SERC, the appropriate LEPC, and the fire department with jurisdiction over the facility.

Also, all LEPCs shall complete a comprehensive emergency response plan that shall be evaluated annually. Each LEPC shall include the following components in their comprehensive emergency response plan:

- Identification of facilities subject to the requirements of EPCRA that are within the LEPC's respective emergency planning district, identification of routes likely to be used for the transportation of substances on the list of extremely hazardous substances, and identification of additional facilities contributing or subjected to additional risk due to their proximity to facilities such as hospitals or natural gas facilities.

- Methods and procedures to be followed by facility owners and operators and local emergency and medical personnel to respond to any release of such substances.
- Designation of a community emergency coordinator and facility emergency coordinators, who shall make determinations necessary to implement the plan.
- Procedures providing reliable, effective, and timely notification by the facility emergency coordinators and the community emergency coordinator to persons designated in the emergency plan, and to the public, that a release has occurred.
- Methods for determining the occurrence of a release, and the area or population likely to be affected by such release.
- A description of emergency equipment and facilities in the community and at each facility in the community, and an identification of the persons responsible for such equipment and facilities.
- Evacuation plans, including provisions for a precautionary evacuation and alternative traffic routes.
- Training programs, including schedules for training of local emergency response and medical personnel.
- Methods and schedules for exercising the emergency plan.

Chemicals of emerging concern are addressed by EPCRA if the chemical is requires an SDS.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

Over the past 30 years, EPCRA has had a significant contribution to the protection of human health and the environment by providing emergency planners and first responders with critical information on hazardous chemical inventories and releases through its various provisions such as the hazardous chemical inventory and the emergency planning mandate. Prior to the enactment of EPCRA, communities and first responders throughout Vermont did not have basic information on what hazardous chemicals were being used or stored at local facilities. Due to EPCRA, communities and first responders have valuable information on hazardous chemicals that enable them to plan, equip, train, and exercise on emergency plans related to a hazardous chemical release. Also, the formation of the SERC and LEPCs created thresholds of hazardous chemicals set to match local emergency planning needs. This has resulted in the identification of numerous hazardous chemical facilities throughout the State.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (CALIFORNIA PROPOSITION 65)

Statutory Authority: CA Health and Safety Code §§ 25249.5 – 25249.13

Regulatory Authority: 27 CCR §§ 25102 - 27001; Office of Environmental Health Hazard Assessment

Administering Agencies/Departments:

The State of California has been authorized to administer the Safe Drinking Water and Toxic Enforcement Act of 1986, commonly known as Proposition 65. The Office of Environmental Health Hazard Assessment (OEHHA) administers the Act in the state.

Overview of Regulatory Program(s):

Proposition 65 regulates the use of chemicals known to cause cancer, birth defects, or reproductive harm ("listed chemicals") to protect the state's drinking water from contamination from these chemicals and to notify Californians of the presence of these chemicals so they can limit their exposures. California is required to publish a list of such chemicals, and to: (a) prohibit businesses from knowingly discharging listed chemicals into drinking water sources, and (b) require businesses to provide "clear and reasonable warning" about significant exposures to listed chemicals allowing citizens to make informed decisions regarding these chemicals. (See 27 CCR § 25601).

Summary of Regulated Substances:

Proposition 65 regulates the allowable levels of these chemicals in drinking water sources, products, the environment and workplaces. The regulation applies to businesses employing 10 or more individuals doing business in California. The Governor is required to publish a public list of chemicals updated at least annually, with the assistance of the States Qualified Experts, consisting of the Carcinogen Identification Committee (CIC) and the Developmental and Reproductive Toxicant Identification Committee (DARTIC). A new chemical can be added in four ways: being a chemical identified in the Labor Code[3]; be determined by the State's Qualified Experts as having clearly shown to cause cancer or birth defects of reproductive harm; formally identified by Authoritative Bodies[4] as causing cancer, birth defects, or reproductive harm; or being formally identified by a state or the federal government as causing cancer, birth defects, or reproductive harm.

Proposition 65 requires all listed chemicals to have a "safe harbor" level determined by the administering agency. Many chemicals on the Proposition 65 list have such an established safe harbor level, which includes No Significant Risk Levels (NSRLs) for carcinogens and Maximum Allowable

[3] Labor Code § 6382(b)(1) (which incorporates chemicals identified by the World Health Organization's International Agency for Research on Cancer as causing cancer in humans or laboratory animals).

[4] The following organizations have been designated as authoritative bodies: the U.S. Environmental Protection Agency; the U.S. Food and Drug Administration; the National Institute for Occupational Safety and Health; the National Toxicology Program of the U.S. Department of Health and Human Services; and the International Agency for Research on Cancer (IARC).

Dose Levels (MADLs) for birth defect or reproductive toxicants. The MADL is 1/1000th the level of exposure of an organism, found by experiment or observation, at which there is no biologically or statistically significant increase in the frequency or severity of any adverse effects in the exposed population when compared to appropriate controls (referred to as the No Observable Adverse Effects Level, or "NOAEL"). In the case a safe harbor level is not available, a business must establish their own according to the assessments defined by the NSRL or MADL.

Excluded from regulation under the Act are substances include naturally-occurring chemicals in food and all chemicals that are not classified as a carcinogen or reproductive toxicant. Additionally, all businesses with less than 10 employees are exempt from Proposition 65 requirements. Businesses with 10 or more employees are exempt only if the discharge or exposure of a listed chemical is below the safe harbor level or, in the case OEHHA has not established a safe harbor level, the business must be able to determine that the chemical exposure poses no significant risk to cause cancer, birth defects or reproductive harm.

Emerging contaminants may be added to the list if/as they are determined to be a carcinogen or reproductive toxicant by one of the four approved methods listed above.

Summary of Reporting Requirements:

Proposition 65 does not require reporting to the state. The State of California maintains the list of chemicals and businesses (of 10 or more individuals) are required to notify the public if a consumer product, environment or workplace knowingly exposes individuals to a listed chemical at an amount exceeding safe harbor levels. A consumer product exposure refers to, "an exposure that results from a person's acquisition, purchase, storage, consumption, or other reasonably foreseeable use of a consumer good, or any exposure that results from receiving a consumer service" 27 CCR § 25602(b). An environmental exposure refers to, "an exposure that may foreseeably occur as the result of contact with an environmental medium, including, but not limited to, ambient air, indoor air, drinking water, standing water, running water, soil, vegetation, or manmade or natural substances, either through inhalation, ingestion, skin contact, or otherwise" 27 CCR § 25602(c). An occupational exposure is defined as, "an exposure to any employee in his or her employer's workplace" 27 CCR § 25602(d).

An acceptable notification can be in the form of a sign, notice, sticker or label. The notification must "clearly communicate that the chemical in question is known to the state to cause cancer, or birth defects or other reproductive harm". Businesses are not required to provide OEHHA with any information regarding their decision to provide a Proposition 65 warning. Enforcement is carried out through the California Attorney General's Office.

Summary of Management Requirements:

Prohibition of discharges. Businesses are prohibited from knowingly discharging listed chemicals into sources of drinking water. This prohibition extends to any "discharge or release into water or onto or into land" and a "discharge or release into air that is directly and immediately deposited into water or onto land" 27 CCR § 25102(f).

Chemicals known to cause cancer, birth defects or reproductive harm. There is no direct chemical management through OEHHA. Proposition 65 indirectly reduces the use of chemicals by prohibiting releases to water, setting Safe Harbor levels, and requiring public notifications of chemical exposure, resulting in businesses choosing to reformulate products or take other actions to avoid liability.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

The effectiveness of Proposition 65 remains controversial. Overall, it has been successful in preventing some releases of carcinogens and reproductive toxicants. Ann Blake, a member of the California Green Ribbon Panel and an expert in policy, voices that though the Proposition does not ban the use of listed chemicals, the reduction of chemicals is largely due to the strong impact on businesses to reformulate products without listed chemicals and prohibit releases of listed chemicals into drinking water. Other evaluations suggest that Proposition 65 has generated significant reductions in industrial air emissions of substances, such as lead, and reformulations of common consumer products.[4]

While the program is effective in reducing the release of some toxic substances, there are a few key gaps and weaknesses. A large gap is the limitation of regulated substances to only carcinogens and reproductive toxicants. Proposition 65 has successfully been in place for over 20 years, and more knowledge exists today about other classes of toxic substances, such as hormone disruptors, that are entirely excluded from this regulation. A significant weakness of this program is the consumer labeling component. The labeling to warn consumers of carcinogens and reproductive toxicants has become so widespread on products and in public environments that it has become somewhat meaningless to consumers.

Addressing contaminants of emerging concern, Proposition 65 adds chemicals to the list as discovered and approved in accordance with one of the four methods in the regulation, but this relies on sufficient evaluation of the contaminant to be able to make findings of its potential to cause cancer, birth defects, or other reproductive harm.

OEHHA is adequately funded and staffed to meet statutory and regulatory purposes. This is in part due to the low-level approach that OEHHA takes to regulate chemicals with the creation of a list. Other California agencies and programs are tasked with complementary chemical roles and responsibilities, such as, the Attorney General's enforcement of Proposition 65.

[4] See Rechtschaffen, C., Williams, P. *The continued success of Proposition 65 in reducing toxic exposures.* Environmental Law Institute, 2005.

MASSACHUSETTS TOXIC USE REDUCTION ACT

Statutory Authority: Ma. Gen. Law, chapter 21l

Regulatory Authority: 310 CMR 50.00

Administering Agencies/Departments:

The Massachusetts Toxic Reduction Act (TURA) is administered by a partnership of four Massachusetts state agencies: the Administrative Council on Toxics Use Reduction; the Massachusetts Department of Environmental Protection (MassDEP); the Office of Technical Assistance (OTA); and the Toxics Use Reduction Institute (TURI) at the University of Massachusetts Lowell.

Overview of Regulatory Program(s):

TURA was originally adopted in Massachusetts in 1989 to promote safer and cleaner chemical production that enhances the economic viability of Massachusetts firms. TURA requires that Massachusetts companies that use large quantities of specific toxic chemicals to evaluate and plan for pollution prevention opportunities through toxic use reduction (TUR), implement them if practical, and annually measure and report the results of implementation. TUR is fundamental form of pollution prevention that focuses on the use of toxic chemicals and the generation of wastes in the manufacturing process. TUR involves in-facility changes that are aimed at reducing, avoiding, and/or eliminating the use of toxic chemicals or the generation of hazardous waste, emissions (to air or land), and by-products per unit of product manufactured. TUR does not focus on the management or treatment of wastes once they are produced.

Specifically, the overall objectives of TURA are:

- To establish a statewide goal of reducing toxic waste generated by fifty percent (50%) by the year 1997 using TUR as the means of meeting this goal;
- To establish TUR as the preferred means for achieving compliance with any federal or state law or regulation pertaining to toxics production and use, hazardous waste, industrial hygiene, worker safety, public exposure to toxics, or releases of toxics into the environment and for minimizing the risks associated with the use of toxic or hazardous substances and the production of toxic or hazardous substances or hazardous wastes;
- To sustain, safeguard, and promote the competitive advantage of Massachusetts businesses, large and small, while advancing innovation in toxics use reduction and management;
- To promote reductions in the production and use of toxic and hazardous substances within the commonwealth, both through the programs established in section three of this Act and through existing toxics-related state programs;
- To enhance and strengthen the enforcement of existing environmental laws and regulations within the commonwealth; and

- To promote coordination and cooperation between all state departments and agencies administering toxics-related programs.

Under TURA, facilities that are subject to TUR planning requirements are required to:

- prepare a Toxics Use Reduction Plan, in which they examine how and why toxic chemicals are used at their facility, and evaluate what their toxics use reduction options are:
- certify (by a facility official and a state-certified TUR planner) that the plan meets regulatory requirements and demonstrates a good faith and reasonable effort to identify and evaluate TUR options; and
- annually report the quantities of toxic chemicals manufactured, processed, or used and pay a fee indexed to the size of the company and number of toxics that exceed the thresholds.

Summary of Regulated Substances:

All substances listed on the federal Toxics Release Inventory (TRI) under Section 313 of the federal Emergency Planning and Community Right to Know Act (EPCRA) are subject to TURA requirements. Also, substances on the federal Comprehensive Environmental Response and Compensation Liability Act (CERCLA) list are subject to TURA reporting and planning (except for chemicals that have been delisted). There are currently over 1,300 chemicals that are subject to reporting in Massachusetts.

TURA allows for chemicals to be added or removed from the list of regulated chemicals and for the designation of listed chemicals as "higher hazard substances," which results in a lower reporting threshold being established for those chemicals.

Massachusetts companies are subject to TURA requirements if they meet the following criteria:

- The company has 10 or more full time employees; and
- The company is a facility that us classified by specified Standard Industrial Classification (SIC) codes including 10-14 (mining), 20-39 (manufacturing), 40 and 44-49 (transportation), 50 and 51 (wholesale), and 72, 73, 75, and 76 (certain services); and
- The company exceeds any threshold for a TURA listed chemical, which include:
    - 1000 pounds for Higher Hazardous Substances;
    - 100 pounds, 10 pounds, or 0.1 gram (depending on the chemical) for persistent, bioaccumulative or toxic (PBT) chemicals identified as such under TRI;
    - 25,000 pounds for non-PBT TRI chemicals manufactured or processed; and
    - 10,000 pounds for non-PBT TRI chemicals otherwise used.

Summary of Reporting Requirements:

Facilities subject to TURA planning and reporting are required to complete TUR plans and submit implementation reports every other year.

TURA plans must also include facility descriptions, management policy statements, a description of employee engagement in planning process, production unit and process descriptions, identification and analysis of toxics use reduction options with technical and financial feasibility analyses of options. TUR plans must be maintained onsite at the facility, but are not submitted to MassDEP.

Annual reports must include chemicals used, by-products, emissions and products produced, a listing of production units, and certification statements. Where there is overlap with federal TRI reporting requirements, facilities can submit TRI forms along with MassDEP TUR forms to reduce their overall paperwork burden to eliminate duplicity in reporting.

Summary of Management Requirements:

There are no management requirements are established under TURA.

Summary of Program's Effectiveness in Reducing Threats to Human Health and the Environment from Toxic Substances, Hazardous Wastes, or Hazardous Materials:

TURA has applied flexible regulation to bring about the reduction of hundreds of millions of pounds of toxics use in the state while saving regulated businesses money and prompting industrial innovation.

The program has achieved dramatic results. Over the first ten years of its implementation (1990 – 2000), Massachusetts companies subject to TURA reduced toxic chemical use by 40% and on-site releases by 90%. Over the following ten years (2000 – 2010), companies reduced toxic chemical use by 22% and on-site releases by 65%. These figures are production-adjusted (i.e., they represent true improvements in the efficiency with which companies use toxic chemicals per unit of product).

The TURA program recently completed a review of 20 years of data on Massachusetts companies' use of chemicals that cause cancer. The report found that Massachusetts companies subject to TURA have reduced their use of carcinogens by nearly a third, and reduced releases by 93%, over a 20–year period. (These figures are not production-adjusted.)

Another unique factor of the law is its "citizen involvement" provision (Section 18 of chapter 21l), which allows for any ten residents that live within ten miles of a facility that is required to prepare a TUR to petition the state to examine the plan and information and determine its compliance with TURA provisions. The state is then required to report its determination to the petitioners and the facility in writing. This is an important provision as TURA does not require that such plans are actually submitted to the state for review.

APPENDIX D

Requirements for Addressing Threats from Chemicals of Emerging Concern

I. WHAT ARE CONTAMINANTS OF EMERGING CONCERN?

Current research shows that many relatively unstudied chemicals and microbial constituents that have not historically been considered contaminants are ubiquitous in the environment at a global scale. These classes of chemicals are typically referred to as "contaminants of emerging concern", CECs, or "emerging contaminants", and are defined by the U.S. Geological Survey as:

> ***"[A]ny synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and(or) human health effects."***

Pharmaceuticals, Personal Care Products, and Cosmetics (PPCP) are one group of CECs. Other types include pesticides, disinfection by-products, chemicals used in commerce, waterborne pathogens, nanoparticles and biological toxins. Persistent, bio-accumulative and toxic substances (PBT) and other high-production volume chemicals (HPV) are other major categories of potential contaminants that have caused recent concern of risk to human health and/or the environment and that are currently being investigated.

Releases of these and other types of CECs into the environment, either directly or from the synthesis of new chemicals or changes in use and disposal of existing chemicals, has likely occurred for a long time but are not recognized until and unless detection methods are developed to be able to identify and detect them in the environment. Because these contaminants are difficult to detect or are unable to be detected using existing analytical methods, and because many of the potential human health and environmental risks of these contaminants are unknown, it is extremely difficult to identify and regulate associated pathways to exposure and mitigate the potential risks to human health and the environment. In this way, existing regulatory programs that regulate categories of chemicals or specifically "listed" chemicals based on the known risks of those chemicals are typically not effective at regulating risks posed by emerging contaminants.

Some states, as well as some other countries, have begun to monitor CECs and other unregulated chemicals and contaminants to better understand how they enter the environment, the associated pathways and potential risks posed by these contaminants, and therefore, how to effectively regulate their usage to prevent from potential harm. This document discusses the effectiveness of existing programs that regulate toxic and hazardous wastes and substances. This document also identifies and explains some of the programs that exist at the federal level or within individual states or other countries that are specifically focused on tracking emerging contaminants

II. REGULATORY PROGRAMS THAT ADDRESS THREATS FROM TOXIC OR HAZARDOUS WASTES OR SUBSTANCES

Appendix C of this report (Requirements for Reporting of Use, Management, and Responses to Releases of Toxic/Hazardous Wastes and Substances) identifies existing programs administered by the federal government and/or by the State of Vermont (as well as the states of Massachusetts and California), that regulate toxic chemicals or hazardous substances or wastes. Many of these programs contain specific reporting or management requirements that apply to the specific substances, facilities, activities and processes regulated under them.

Many of the programs identified in Appendix C regulate contaminants that have been specifically listed through a regulatory action (e.g., listing by rule), and for which specific health-based risk levels have been identified. Examples of such "lists" are the list of hazardous air pollutants identified under the Clean Air Act, the list of contaminants identified under the Clean Water Act, and the list of hazardous materials identified for regulation under the RCRA Subtitle C Hazardous Waste Program. Contaminants specifically identified on lists such as these have been identified based on known risks to human health and the environment. Typically, new contaminants can be added to these lists and regulated under the respective program, but only if there are sufficient analytical methods and information about potential risks posed by those contaminants (i.e. carcinogenic effects, toxicity, etc.) so that a health-based risk standard may be set. However, by their nature, contaminants of emerging concern are not commonly monitored, may not be detected by existing analytical methods, and largely have not been comprehensively studied for potential effects on human health and the environment. It is therefore difficult to list a contaminant of emerging concern for regulation under existing regulatory programs and to set appropriate health-based risks levels for those contaminants.

The next section discusses some programs and other initiatives that states and other jurisdictions have set in place to specifically monitor and address threats from emerging contaminants.

III. REGULATORY AND OTHER PROGRAMS THAT ADDRESS THREATS FROM EMERGING CONTAMINANTS

Due to the increased concern of CECs in the environment and the lack of information about those contaminants and the risks they pose, many jurisdictions are developing programs to identify, monitor, and take steps to review and study these contaminants to support future regulatory actions to manage them. This section identifies these programs that currently operate at the state and federal levels, as well as programs that have been put in place in other countries to address threats posed by CECs.

A. PROGRAMS IN OTHER STATES

At the state level, programs to evaluate CECs are located within universities, health departments, and environmental conservation and protection agencies. The objectives of these programs vary from contaminant-specific research to broad sampling and risk determination efforts. Below is a

summary of programs in several states that illustrate the differences in scale and scope of these state-administered programs. This is not an exhaustive list, but rather a sampling of the several, more formal, programs and initiatives that have been employed to gather information and/or address risks posed by CECs and other unregulated chemical contaminants. Many of these programs provide geographic and numerical data that can be used to evaluate the presence of these contaminant in Vermont. The programs also include guidance on the processes used to develop priority lists of contaminants of emerging concern for regulation.

CALIFORNIA

The State of California actively monitors and evaluates multiple CECs through several different programs including Proposition 65 and state environmental and biomonitoring programs, and by establishing provisional guidance values for CECs. The Office of Environmental Health Hazard Assessment (OEHHA) within the California Environmental Protection Agency is primarily charged with administering these programs and initiatives, though other agencies and departments participate in efforts to assess and monitor CECs and other contaminants as well.

- ***Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)***

The California Safe Drinking Water and Toxic Enforcement Act of 1986, also known as Proposition 65 (or Prop 65), is administered by OEHHA. The program requires that the state publish an annual list of chemicals known to cause cancer or reproductive toxicity. The Proposition 65 list includes approximately 800 naturally-occurring and synthetic chemicals and is developed by a Science Advisory Board, comprised of 2 committees (the Carcinogen Identification Committee, and the Reproductive Toxicant Identification Committee). The Science Advisory Board reviews and proposes standards and procedures, identifies authoritative bodies, and reviews scientific information.

Proposition 65 requires businesses to provide a "clear and reasonable" warning before knowingly and intentionally exposing anyone to a chemical that is included on the Proposition 65 chemicals list. Once a chemical is listed, businesses have 12 months to comply with the warning requirements. The warning can be provided through a variety of means, such as by labeling a consumer product, posting signs at the workplace, distributing notices at a rental housing complex, or publishing notices in a newspaper.

More information about the California Proposition 65 Program can be found at:
http://oehha.ca.gov/proposition-65/law/proposition-65-law-and-regulations

- ***Environmental Contaminant Biomonitoring Program***

The California Biomonitoring Program is a multi-agency program involving the California Health Department, the California Department of Toxic Substances Control (DTSC), and Office of Environmental Health and Hazard Assessment (OEHHA). Biomonitoring is the measurement of chemicals (or their metabolites) in a person's body fluids or tissues, such as blood or urine.

The process of biomonitoring reveals the amount of a chemical that enters a person's body from all environmental sources (for example, from air, soil, water, dust, and food) combined, and in this way, provides information regarding a person's exposure to a toxic chemical. This information can be used to estimate levels of chemicals in a representative sample of the population, establish trends in levels of chemicals over time, and help assess the effectiveness of public health efforts and regulatory programs to limit exposures to specific chemicals.

The Program selects specific chemicals to measure in a certain project. Chemicals are selected for a project based on recommendations by the California Scientific Guidance Panel, public health importance factors, relevance of a chemical to a group of people being studied, feasibility and resources considerations, as well as laboratory and testing considerations. Chemicals and chemicals groups currently being measured in California biomonitoring studies include:

Arsenic
Benzophenone-3 (oxybenzone)
Bisphenol A (BPA)
Cadmium
Cobalt
2,4-Dichlorophenoxyacetic acid (2,4-D)
N,N-Diethyl-3-methylbenzamide (DEET)
Environmental Phenols
Herbicides
Lead
Manganese
Mercury
Metals
Molybdenum
Organochlorine pesticides
Organophosphate pesticides
Other pesticides
Uranium
Parabens
Perchlorate
Perfluoroalkyl and polyfluoroalkyl substances (PFASs)
Perfluorochemicals (PFCs)
Pesticides
Phthalates
Polybrominated Diphenyl Ethers (PBDEs)
Polychlorinated Biphenyls (PCBs)
Polycyclic Aromatic Hydrocarbons (PAHs)
Pyrethroid pesticides
Selenium
Strontium
Thallium
Triclosan
Tungsten

More information on California's Biomonitoring Program can be found at:
http://www.biomonitoring.ca.gov/

- ***Safer Consumer Products***

The California Department of Toxic Substances Control (DTSC) administers the Safer Consumer Products Program within the state. The goals of the Program are to reduce toxic chemicals in consumer products, create new business opportunities in the emerging safer consumer products industry, and to help consumers and businesses identify what is in products they purchased and use for themselves, their families, and their customers. The state's Green Chemistry Law passed in 2008 and requires DTSC to adopt regulations to identify and prioritize

chemicals in consumer products. The resulting regulations also address a process for evaluation of CEC in consumer products and possible alternatives for those chemicals.

The DTSC maintains the California Candidate Chemicals List of approximately 1,200 chemicals selected based on the work of other authoritative organizations. The DTSC has defined a process to add additional chemicals to this list if that chemical has at least one quality ("hazard trait") that can cause harm to humans or the environment. Another list includes specific Priority Products, which are consumer products that contain one or more of the listed Candidate Chemicals. Responsible entities (manufacturer, importers, assemblers, and retailers) are required to notify DTSC when their product is listed as a Priority Product, and then must perform an Alternatives Analysis on the product to determine how to limit exposure, or reduce the level of harm, posed by the identified chemicals. The DTSC reviews the analysis to determine whether the chosen alternative will create an adverse public health or environmental impact that requires a regulatory response.

More information on California's Safer Consumer Products Program can be found at: http://www.dtsc.ca.gov/scp/

MASSACHUSETTS

The Massachusetts Department of Environmental Protection (MADEP) oversees the Emerging Contaminants Workgroup, which is charged with identifying and assessing public health and environmental problems associated with currently unregulated or under-regulated contaminants, and recommending agency strategies for addressing them. The Workgroup actively monitors and evaluates multiple contaminants for priority emerging contaminants including 1,4-dioxane, cyanobacteria, nanoparticles, perchlorate, pharmaceuticals, PBDE, PCE, and TCE. The Workgroup developed a process to screen and prioritize these contaminants. Several of these chemicals have been identified as priorities for further evaluation and agency action, while many remain on a watch list for further information gathering prior to agency action.

More information on Massachusetts Emerging Contaminant Workgroup can be found at: http://www.mass.gov/eea/agencies/massdep/toxics/sources/emerging-contaminant-workgroup.html

Massachusetts also maintains a program to study and monitor pharmaceuticals in state waters, aimed at reducing the amount of medications that go to wastewater treatment plants.

MINNESOTA

Minnesota administers a formal program to monitor and assess CECs within its Department of Health. Work of the program also includes identifying CECs, selecting chemicals for in-depth research/screening, and evaluating CECs for development of drinking water guidance and information about exposure. Every two years, the program screens 20 chemicals and provides guidance for up to ten chemicals. The program also contracts with external entities for

specialized research to collect data, develop new methods of risk assessment and new modeling and tools to improve risk assessments for CECs.

Health and exposure criteria are evaluated by the program prior to selecting contaminants for screening. Those chemicals selected are evaluated according to how they are used in the state, their potential to enter the water supply, and their toxicity to humans. Staff can use information on health effects to calculate a contaminant water concentration level, which is produced as guidance.

More information on Minnesota's Contaminants of Emerging Concern Program can be found at: http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/activities.html

The University of Minnesota recently completed a review of the Minnesota Department of Health CEC program's chemical selection process. The review included fact gathering about the program, a literature review of scientific articles related to CECs and processes for chemical screening, analysis of similar programs, and evaluation of the CEC screening process used by the program. This review was conducted as a result of a legislative mandate. The report was submitted to the Minnesota legislature and can be found at: http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/cec2016report.pdf

The report's appendices can be found at: http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/cecappendices2016.pdf

NEW JERSEY

New Jersey Department of Environmental Protection's Science Advisory Board formed the Contaminants of Emerging Concern Workgroup to actively monitor and address CECs throughout the state. A report of the Workgroup, which was released in 2012, analyzed CECs in the environment and recommended the technical steps the Department should take to better understand and manage these chemicals.

The Workgroup's report identified a four-step framework that the State of New Jersey uses to identify and prioritize CECs. The framework is specific to and most appropriate for New Jersey's environment and biota, prioritizing these chemicals for regulatory action based on risk assessment. The framework is intended to be used for any compound that may arise as a potential concern in the state.

A complete copy of the New Jersey Contaminants of Emerging Concern Workgroup 2012 report may be found at: http://www.state.nj.us/dep/sab/CECFramework%20Final%20Report.pdf

NEW YORK

In New York, state officials actively monitor and evaluate CECs in state waters through various initiatives: multiple New York agencies collaborate on this work throughout the state, many of which are housed within the Department of Environmental Conservation. The department's

Pharmaceuticals Work Group engages on a regional level with other states, the EPA, the USGS, drug manufacturers, and pharmacies to study and evaluate trace contaminants, including pharmaceuticals, that make their way into the state's surface waters. Efforts of the Work Group focus on developing a viable system for return of unwanted drugs so they can be disposed of in a safe, legal, and environmentally-sound manner.

More information on New York's actions to reduce drugs in surface waters can be found here: http://www.dec.ny.gov/chemical/45118.html

The Department of Environmental Conservation, in conjunction with the state's Department of Health, has developed an Ocean Action Plan, which is a focused effort on improving the health of the ocean ecosystem and its ability to sustain important habitat and other benefits to state residents. The plan encompasses a 10-year plan for action, and addresses synthetic chemicals or naturally-occurring microorganisms that are not commonly included in water quality monitoring programs, but that are detected in the marine environment and have the potential to adversely affect human health and negatively impact aquatic wildlife at low concentrations (the plan specifically identifies detergent components, pesticides, personal care products, flame retardant chemicals, and pharmaceuticals). The plan lays out a multi-step process for addressing these chemicals in the marine environment, and encourages monitoring and assessment of these chemicals' impact on ecological processes, and working with state and federal partners to develop and propose water quality standards to protect aquatic life from CECs within the next 5 years. The complete New York Ocean Action Plan can found here: http://www.dec.ny.gov/lands/84428.html

Through legislation, the state of New York has also banned children's products that contain certain percentages of flame retardants (such as PBDEs and TCEP). Lastly, the departments of Environmental Conservation and Health are taking efforts to address and respond to threats caused by perflurooctanoic acid (PFOA) in drinking water, and is conducting biomonitoring and blood testing studies, at a site in Hoosick Falls.

OREGON

The Oregon Department of Environmental Quality developed a list of priority persistent pollutants that should be limited from entering the environment through effluent from wastewater treatment facilities. The initiative focuses on "persistent pollutants", which are those pollutants that are toxic, persistent in the environment, and/or accumulate in humans or the food chain. Oregon evaluated potential contaminants and relied on pre-existing national lists to develop a list of 118 pollutants and then assigned "trigger" levels for each. A trigger level is set as a default at the Maximum Contaminant Level (MCL) promulgated by EPA as a primary drinking water standards under the Safe Drinking Water Act. If no such value exists for a contaminant, then the trigger level is set based on other set regulatory and toxicological values that may be set.

The largest of the Oregon waste water treatment plants are required to monitor effluent for exceedances of the trigger levels. Where trigger levels are exceeded, the plant is required to develop and submit a plan to reduce effluent levels.

The listed persistent pollutants that are required to be tested include PAHs, pesticides, halogenated flame retardants, pharmaceuticals, perfluorinated surfactants, industrial chemicals, metals, PCBs, pesticides, and dioxins and furans.

More information on Oregon's Priority Persistent Pollutants initiative can be found here: http://www.deq.state.or.us/wq/SB737/

WASHINGTON

The state of Washington maintains a formal program for studying and addressing CECs under a Toxics Studies Unit within the Department of Ecology (a subunit of the Washington Department of Health). Studies produced by the Unit provide a foundation for decisions made by governing agencies to reduce risks from CECs. The Unit conducted both short-term studies, including Total Daily Maximum Load (TMDL) assessments, water clean-up plans, and stormwater studies. Long-term projects include sampling of fish and water to characterize levels of toxic contaminants and determine changes in levels over time, and persistent bioaccumulative toxics (PBT) monitoring to evaluate trends of PBT in fish tissue, sediment, and suspended particulate matter. More information on the Toxic Studies Unit and its mission can be found here: http://www.ecy.wa.gov/programs/Eap/toxics/index.html

The Washington Department of Ecology also maintains a list of identified chemicals of concern, which are frequent targets of monitoring efforts because of these chemicals' nature to persist in the environment, build up in animal tissue, and/or their toxicity. This list is made available to the public, and includes mercury, lead, flame retardants, pharmaceuticals, PCBs, per- and polyfluoroakyl substances (PFASs), chlorinated pesticides, dioxins and furans, and PAHs. The Chemicals of Concern list and information related to the listed chemicals and contaminants can be found here: http://www.ecy.wa.gov/programs/eap/toxics/chemicals_of_concern.html

Washington has also undertaken more specific projects and initiatives. The Department of Ecology has developed Chemical Action Plans (CAP) to identify, characterize, and evaluate all uses and releases of specific persistent bioaccumulative toxics or metal. A CAP focuses on a singular toxic, and recommends action to protect human health and the environment from these that toxic, but is not a rule or requirement to do so. CAPs are developed in collaboration with other agencies and experts. To date, CAPs developed address mercury, PBDEs, lead, and PAHs. A future CAP is anticipated to address PCBs.

More information on the Washington Department of Ecology Chemical Action Plans can be found at: http://www.ecy.wa.gov/programs/hwtr/RTT/pbt/caps.html

VERMONT

Vermont has several initiatives underway, many that have been began recently, to address CECs in the environment.

- ***Surface Water Management Strategy***

The Department of Environmental Conservation's Watershed Management Division defines emerging contaminants in its Surface Water Management Strategy as "newly identified manmade compounds that result from human usage". The Strategy also recognizes Pharmaceuticals and Personal Care Products as Pollutants (PCPP) – these are any product used by individuals for personal health or cosmetic reasons.

The Strategy recognizes that these contaminants are being detected in groundwater, streams, rivers, lakes, reservoirs, and drinking water supplies of the Northeast in low concentrations, and that many unknowns remain regarding the potential for adverse effects on ecological receptors and humans from these contaminants. Therefore, the goals of the Strategy include minimization of pollutants to the state's water bodies from emerging contaminants and toxic and pathogenic pollution. Objectives proposed to achieve this goal include: (1) development of a strategy for monitoring contaminants of emerging concern by investigating partnerships with USGS and/or academic institutions; and (2) utilization of educational and outreach efforts to promote minimization of pesticides and awareness of CECs and disposal of pharmaceuticals. The Strategy recognizes several obstacles and limitations on being able to accomplish such work, however, including:

- a lack of laboratory capacity and available funds needed to monitor the occurrence of CECs is in Vermont;
- limited information available on low-cost treatment systems to reduce the release of CECs from secondary wastewater treatment facilities; and
- no water quality criteria for many of the CECs where aquatic impacts are known.

More information on the Vermont Surface Water Management Strategy can be found at: http://dec.vermont.gov/watershed/map/strategy

- ***Chemicals of Concern in Children's Products (Act 188)***

The Vermont Legislature passed Act 188 in 2014, which created a requirement for manufacturers that use certain amounts of chemicals that are designated by the State as "Chemicals of High Concern to Children" (CHCC) in children's products that are sold in Vermont to report to the chemical usage to the Vermont Department of Health. Several CHCCs were identified directly in the text of the law itself (see *Appendix C* of this report for the complete summary and list of chemicals regulated under Act 188). To date, there are 66 designated chemicals. The Department of Health also has the authority to designate additional chemicals through rulemaking.

Chemical reporting by manufacturers must include the chemical name and the chemical abstracts services (CAS) registry number, the product component containing the chemicals, the amount of

the chemical contained in each unit of the product or product component, contact information of the manufacturer, the function of the chemical in the product, and other information. Currently, there is no requirement beyond the requirement to report the chemical usage and disclose certain information about the chemicals used.

More information on Act 188 can be found at: http://healthvermont.gov/environment/children

- ***Sampling of Perfluorinated Compounds in Drinking Water and Soil***

In February of 2016, the private drinking water wells of several Vermonters in North Bennington were found to be contaminated with elevated levels of a potential carcinogen, perfluorooctanoic acid (PFOA). PFOA and other perfluorinated compounds (referred to as "PFCs") are man-made substances used to create nonstick coatings and other heat-resistant and water-repellant qualities in a variety of consumer products. The Agency of Natural Resources, in conjunction with Department of Health and other emergency responders and municipal entities spent several months responding to the situation, conducting sampling in private and public drinking water sources, surface waters, and soils. Blood samples were also analyzed. Other sites around the State were also investigated and tested for PFC compounds. The State coordinated its regulatory efforts with the states of New York and New Hampshire (where similar contamination had recently been discovered), the Environmental Protection Agency.

In response to these events, and due to toxic, persistent, and carcinogenic effects of PFOA and a similar compound, PFOS (which was also identified at several Vermont sites), the Agency of Natural Resources took an emergency regulatory action to establish a hazardous waste standard for PFOA and PFOS under the Vermont Hazardous Waste Management Regulations and the Vermont Groundwater Protection Rule and Strategy.

- ***Act 154 of 2016***

In part because of the State's response to PFOA and PFOS contamination in Bennington and other parts of the State, the Vermont General Assembly passed Act No. 154 of 2016 (An act relating to potable water supplies from surface waters). Among the purposes of the Act was the creation of the Agency of Natural Resources' Working Group on Toxic Chemical Use in the State. The working group was to be made up of interested parties and experts in the field of toxic chemical use and regulation, and was charged with identifying and studying the landscape of chemicals and toxics regulation among various jurisdictions, including Vermont, and to make recommendations to the Legislature as to how to improve the State's ability to prevent and protect against the risks posed to citizens and the environment from toxic chemicals, hazardous materials, and hazardous wastes. Act 154 demonstrated the General Assembly's broad concern with the pervasive use of toxic chemicals in and around the country, the lack of information about these chemicals and their use, and the significant issue of CECs and limiting risks posed by them. The outcome of this working group is this report.

The complete Act 154 and the complete mandate of the ANR Chemical Working Group can be found here (see Sec. 10 specifically): http://legislature.vermont.gov/assets/Documents/2016/Docs/ACTS/ACT154/ACT154%20As%20Enacted.pdf

More information on the working group's work, including meeting information, stakeholder input, video recording, and process, can be found here: http://anr.vermont.gov/about_us/special-topics/act-154-working-group

DELAWARE RIVER BASIN COMMISSION (DELAWARE, NEW JERSEY, PENNSYLVANIA)

Concern about the impacts of CECs in surface waters, drinking water, and ecology in the Delaware River has spurred a multi-state effort to address these chemicals within the Delaware River Basin The effort in the Delaware River Basin. The states of New York, New Jersey, and Pennsylvania, through the Delaware River Basin Commission, have taken steps to identify, understand, and prioritize CECs on the main stem of the Delaware River. The Commission also spent three years investigating the presence and concentration of PPCPs, PFASs, and PBDEs in the ambient waters of the tidal Delaware River to understand the sources, persistence in the environment, and if/how they degrade in surface water. The results of this report were released in 2009. Additionally, the Commission has an ongoing tissue monitoring program for PFAS and PFCs in the main stem of the Delaware, examining surface water, fish tissue, and sediment. The Commission more recently received grant funding to examine the presence of CECs in several tributaries to the Delaware River that have numerous industrial and municipal discharges to surface water.

More information about the Delaware River Basin Commission's work and report results can be found at: http://www.nj.gov/drbc/quality/reports/cecs.html

B. FEDERAL PROGRAMS

The following section provides information about federal institutions and programs that have been established to identify and evaluate CECs and to understand the occurrence of these substances in the environment. Many of these programs collect data to establish the occurrence and prevalence of contaminants in the environment and establish health hazards. Data is used to inform the potential regulation of these substances.

ENVIRONMENTAL PROTECTION AGENCY

- ***Candidate Contaminant List (CCL)***

The United States Environmental Protection Agency develops Contaminant Candidate Lists (CCL), which list contaminants that are known or anticipated to occur in public drinking water systems and are not currently subject to EPA proposed or promulgated drinking water regulations. The CCL includes substances that, in the future, may require regulation under the

Safe Drinking Water Act (SDWA), including pesticides, disinfection byproducts, chemicals used in commerce, waterborne pathogens, pharmaceuticals and biological toxins. The EPA is required to publish a CCL every five years. On November 17, 2016, the fourth edition of the list (the CCL4) was announced. The CCL4 includes 97 chemicals or chemical groups and 12 microbial contaminants.

Publication of the CCL does not impose any requirements on public water systems. However, if EPA decides to regulate a contaminant on the list in the future, the Agency will start a separate rulemaking process to effectuate a standard. After publication of the CCL, EPA is required to determine whether to regulate at least five contaminants from the list in a separate process called a regulatory determination. A regulatory determination is a formal decision on whether EPA should initiate a process to develop a national primary drinking water regulation for a specific contaminant. A regulatory determination will be made for the CCL4 contaminants for which there is sufficient health effects and occurrence data, and for those that present the greatest public health concern. For contaminants that lack sufficient information to support a determination, EPA will continue to collect data and information to enable a regulatory determination to be made.

More information on the CCL Program and the CCL4 may be found at: https://www.epa.gov/ccl

- ***Fourth Unregulated Contaminant Monitoring Rule (UCMR4)***

EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and that do not have health-based standards set under the Safe Drinking Water Act (SDWA). Under the SDWA, EPA issues a new list of no more than 30 unregulated contaminants to be monitored by public water systems; the list is issued every five years. The fourth edition of the list (the UCMR4) was published on December 20, 2016, and requires monitoring for 30 chemical contaminants between 2018 and 2020 using analytical methods developed by EPA and consensus organizations.

EPA's selection of chemicals for listing through the UCMR is largely based on review of the Contaminant Candidate List (CCL). Additional contaminants may be identified based on current research on occurrence and health effect risk factors. Chemicals that are not registered for use in the United States, do not have an analytical reference standard, or do not have an analytical method for use are generally not considered further. The UCMR provides EPA and other regulatory bodies with scientifically valid data on the occurrence of listed contaminants in drinking water, which enables assessment of the population being exposed and the levels of exposure. The data gathered is one of the primary sources of occurrence and exposure information that the EPA uses to develop regulatory decisions for emerging contaminants.

The Drinking Water and Groundwater Protection Division of the Vermont Department of Environmental Conservation (DEC) obtains the results from UCMR testing. The Division recently requested and received the data reported for other New England States.

More information about the UCMR and the UCMR4 can be found at: https://www.epa.gov/dwucmr/learn-about-unregulated-contaminant-monitoring-rule; and https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule

UNITED STATES GEOLOGICAL SURVEY

- ***Toxic Substances Hydrology Program***

The USGS Toxic Substances Hydrology Program was initiated in 1982 to provide scientific information for characterization, management and protection of surface water, ground water, soil, sediment, and the atmosphere by toxic substances. The program administers the Contaminants of Emerging Concern in the Environment Investigation to provide information about CECs and their potential threat to environmental and human health. Research activities conducted under this initiative include (1) development of analytical methods to measure chemicals and microorganisms or their genes in a variety of environmental media, (2) determine the environmental occurrence of CECs, (3) characterize the various sources and pathways that determine contaminant release to the environment, (4) define and quantify processes that determine CEC transport and fate through the environment, and (5) identify potential ecological effects from exposure to CECs.

More information on the Toxic Substances Hydrology Program's CEC in the Environment Investigation, including many related Science Features and publications, can be found at: https://toxics.usgs.gov/investigations/cec/index.php

- ***USGS's National Water Quality Assessment Program and the National Target Analyte Strategy (NTAS)***

The National Water Quality Assessment Program (NAWQA) within the USGS prioritized 2,541 constituents in surface water, groundwater, and sediment as having potentially adverse effects on human or aquatic health based on their potential to occur in waters or sediment. The list includes pharmaceuticals, disinfection by-products, cyanotoxins, industrial compounds, agricultural compounds, synthetic hormones, various endocrine disruptors, and lipophilic organic compounds, radionuclides in groundwater, trace elements, high-production volume chemicals in water, and VOCs. Constituents were prioritized by the NAWQA National Target Analyte Strategy work group on the basis of information on physical and chemical properties, observed or predicted environmental occurrence and fate, and observed or anticipated adverse effects on human health or aquatic life. Differences in the availability of information access for each constituent led to the development of separate prioritization approaches. Constituents were omitted when there was little, no, or insufficient environmental data to rank them, or when there was limited to no toxicity information. Ultimately, the Water Quality Assessment Program identified 1,081 top priority constituents for ambient monitoring in water and sediment.

More information on NAWQA's prioritization of constituents for ambient monitoring can be found at: https://pubs.usgs.gov/sir/2012/5218/

UNITED STATES DEPARTMENT OF DEFENSE

The role of the Emerging Chemical and Material Risk Management Program within the United States Department of Defense (DOD) is to identify CECs and determine which ones are in use or planned for future use. Chemicals in use for purposes of this assessment include those for military purposes and present some unique challenges. In its chemical assessment, the program includes the impact of a chemical on DoD functions and evaluates whether a chemical can be replaced with a lower risk or green chemical alternative. The program also develops policies for integrating safety and health considerations into the DoD acquisition process.

The *Identification and Evaluation of Chemical Ranking Systems – Final Report, January, 2008* includes a summary of chemicals and possible alternatives used in the military. The report is at: http://www.denix.osd.mil/cmrmp/chemicalmanagement/home/unassigned/identification-and-evaluation-of-chemical-ranking-systems/

OTHER COUNTRIES

European Union

The European Union has adopted two comprehensive sets of regulations to address the production and use of chemicals.

- ***Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)***

The REACH Regulation was developed in 2007 because substances have been manufactured and placed on the market for many years without sufficient information on the hazards and risks they pose. The European Union's (EU) REACH program is unique in several respects. First, the program places the responsibility for risk management of chemicals and safety assessments of substances on industry rather than government. Additionally, the program applies the precautionary principle to chemical regulation; it does not assume that a chemical substance is safe prior to authorizing its use on the market. Rather, REACH requires manufacturers and importers to overcome a presumption that substances are not safe and to develop documentation on toxicology, physical properties, and chemical properties for each substance through a registration process. Furthermore, REACH coordinates EU regulatory requirements for new chemicals in the market and increases collection of information about existing chemicals.

In keeping with the regulation's title, REACH requires chemical producers and importers of more than 1 metric ton of any chemical to register the product. By 2018, existing substances must be registered in a central database with the European Chemicals Agency (ECHA). Registration is also required before any new chemical can enter the market. The registration (or dossier) must include information about chemical and physical properties, uses, and how downstream users should manage any risks associated with the product.

Dossiers are evaluated by EU member states following guidance from ECHA, and EU member states may decide to request additional health and risk information, authorize use, or restrict the chemical use. The evaluation includes a quality review of the dossiers and testing proposals to determine if a substance constitutes a risk to human health or the

environment. For substances manufactured or imported in amounts greater than 10 tons, registrants must perform a chemical safety assessment to identify if additional risk reduction measures are required.

Substances of very high concern (SVHC) will be identified for inclusion on a "candidate list". Substances receiving a SVHC designation will be required to obtain specific authorization for particular uses, or may be required to control risk through labelling, training, or other processes. REACH also encourages for progressive substitution of chemicals receiving this designation when suitable alternatives have been identified.

Less than 200 chemicals or chemical groups are on the current SVHC candidate list. This list includes carcinogenic, mutagenic, or toxic to reproduction substances; persistent, bio-accumulative and toxic chemicals (PBTs); very persistent and bio-accumulative substances; and any substance seriously or irreversibly damaging human health or the environment. No use of these substances is authorized unless there is no adequate alternative.

The provisions of the REACH Regulation will be phased in over 11 years. Progress made under the REACH Regulation is evaluated at 5 year intervals.

More information on the REACH Regulation and requirements can be found at: http://ec.europa.eu/environment/chemicals/reach/reach_en.htm

- ***Regulation on the Classification, Labelling, and Packaging of Substances and Mixtures (CLP)***

The European Union's Classification, Labelling, and Packaging (CLP) Regulation, adopted in 2009, establishes a standard for hazard communication to workers and consumers through harmonized classification and labelling of chemicals.

Before placing chemicals on the market, the industry must establish the potential risks to human health and the environment of such substances and mixtures, classifying them in line with the identified hazards, and labelling them so that users are better informed about the potential hazardous effects and how to best make use of them safely. Under CLP, chemicals must be labelled according to a standardized system, which is based on the United Nations' Globally Harmonized System. In most cases, suppliers "self-classify" by collecting available information, evaluating the reliability of the information, reviewing the classification criteria and making a decision. Downstream users also have a responsibility to review new science and technology and consider if a substance's classification should be re-evaluated prior to placement on the market.

- ***Water Framework Directive and Priority Substances Directive***

The Water Framework Directive (2000/60/ED) (WFD) requires that all necessary measures are taken to progressively reduce pollution of the water environment by priority substances and stop the emissions and discharges of priority hazardous substances. The control policy associated with this objective is set out in Article 16 of the WFD. This article also requires the establishment of a list of the so-called priority substances and a procedure for the identification of priority substances/priority hazardous substances.

Priority Hazardous Substances are a subset of Priority Substances and are considered extremely harmful. Compliance with Priority Substance standards will be used to define "good chemical status" for the Water Framework Directive (WFD). Concentrations of Priority and Priority Hazardous Substances in water must meet the WFD environmental standards by 2015 in order to achieve "good chemical status". In addition, Priority Hazardous Substances emissions must be phased out by 2025.

No substances were defined in Annex X at the time of the publication of the WFD, instead a daughter directive (the Priority Substances Directive, 2008/105/EC) defines the Priority Substances and Priority Hazardous Substances replace Annex X. This Directive also sets out the Environmental Quality Standards for surface water for the 33 Priority Pollutants plus 8 other pollutants. The other pollutants include carbon tetrachloride, trichloroethene and tetrachloroethene and the organochlorine pesticides. All other pollutants defined in the WFD (Annex VIII) also need to be considered with standards being set at Member State level using a risk-based approach.

- ***Groundwater Daughter Directive***

The Groundwater Daughter Directive(2006/118/EC) is formally known as the Groundwater Directive on the Protection of Groundwater against Pollution and Deterioration (2006/118/EC). This establishes groundwater quality standards for the first time (nitrates and pesticides) and introduces the concept of threshold values for groundwater for other WFD pollutants and indicators. A minimum list is set out which includes trichloroethene and tetrachloroethene but others must be identified on the basis of the risk of failing to meet the WFD's environmental objectives. This directive also sets out the criteria for determining trends in pollutant concentrations and also the requirements to prevent and/or limit the inputs of pollutants to groundwater.

- ***Groundwater Regulations (2009) (England and Wales)***

The Groundwater Regulations (GWR) 2009 promulgate the above EC directives. The regulations aim to reduce pollution by preventing the input of hazardous substances and limiting the introduction of non-hazardous pollutants to groundwater. Under the regulations, it is a criminal offence to discharge hazardous substances and/or other nonhazardous pollutants onto or into land, without a permit.

The substances controlled under the regulations fall into two broad groups:

- hazardous substances are the most toxic and must be prevented from entering groundwater; and

- non-hazardous pollutants that are less toxic but could be harmful to groundwater, and the entry of these substances into groundwater must be limited. They include substances that contribute to eutrophication (abnormal growth of algae), in particular nitrate and phosphates, and compounds such as ammonia.

CANADA

Unlike the EU REACH Program that requires companies to register and evaluate all substances in commerce, the Canadian Environmental Protection Act of 1999 (CEPA) used existing data to authorize the continued use of chemicals in commerce, or to require their further assessment. In this way, the list of substances to be evaluated was reduced from over 12,000 to approximately 4,000. Of these, fewer than 1,000 were identified as being of high concern.

Information on CEPA is available on the Environment Canada at: https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=126220C5-1

Environment Canada has an active research program on CECs as described here: https://www.ec.gc.ca/faunescience-wildlifescience/default.asp?lang=En&n=3F9A1AD5-1&xsl=privateArticles2,viewfull&po=7CBFBA49

AUSTRALIA

In 2016, the Australian Department of Environmental Regulation issued Guidance on the Assessment and Management of Perfluoroalkyl and Polyperfluoroalkyl Substances (PFAS), which identified management approaches after a site has been identified as contaminated. Prior to this, the Australian Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Technical Report, No. 32 (2014), which provided general guidance on screening criteria and site remediation and management.

This assessment was carried out under the National Industrial Chemicals Notification and Assessment Scheme (NICNAS). This scheme has been established by the Industrial Chemicals (Notification and Assessment) Act 1989 (the Act), to aid in the protection of the Australian people and the environment by assessing the risks of industrial chemicals, providing information and making recommendations to promote their safe use.

As part of reforms regarding Existing Chemicals, NICNAS has implemented a new framework to address the human health and environmental impacts of previously unassessed industrial chemicals listed on the Australian Inventory of Chemical Substances (AICS).

Stage One of this program examines 3000 chemicals meeting characteristics identified by stakeholders as needing priority assessment. This includes chemicals for which NICNAS already holds exposure information, chemicals identified as a concern or for which regulatory action has been taken overseas, and chemicals detected in international studies analyzing chemicals present in babies' umbilical cord blood.

The Guidance on the Assessment and Management of Perfluoroalkyl and Polyperfluoroalkyl Substances (PFAS) can be found at: https://www.der.wa.gov.au/images/documents/your-environment/contaminated-sites/guidelines/Guideline-on-Assessment-and-Management-of-PFAS-.pdf

For more detail on the program visit the NICNAS at: https://www.nicnas.gov.au/chemical-information/imap-assessments

JAPAN

Japan upgraded its Chemical Substances Control Law in 2011 to prevent environmental pollution caused by those chemical substances that pose a risk of impairing human health or interfere with the inhabitation or growth of flora and fauna. As with EU REACH Program, the law will review all chemicals registered for commerce, but the government assumes a greater share of the task of evaluating chemicals. As with the EU REACH, there are exemptions and non-commercial chemicals that are not included in the regulations.

More details can be found at: http://www.cirs-reach.com/Japan_CSCL/New_Japan_Chemical_Substances_Control_Law_CSCL.html

KOREA

Korea has a law similar to the program enacted in the EU that requires the registration, evaluation, and authorization of chemicals (REACH). The law requires that all chemicals of commerce be registered with the government, that all registered chemicals be evaluated for a minimum set of toxicological and environmental fate attributes, and that chemicals be authorized for safe use. It is not clear how this program is being applied to CECs. As with the European REACH, a limitation of the Korean REACH with respect to CECs is the exemptions of many non-industrial and non-commercial chemicals.

More information on this program can be found at: http://www.cirs-reach.com/KoreaTCCA/Korea_REACH_The_Act_on_the_Registration_and_Evaluation_of_Chemicals.html

CHINA AND SOUTHEAST ASIA

There are few published reports of CECs in environmental samples from Southeast Asia and China. As a consequence, both the presence and distribution of CECs in Southeast Asia and China are not well known. Observations elsewhere suggest CECs may be important contaminants in the aquatic environment due to the enormous production and widespread use of many CECs in China, particularly antibiotics utilized in human and veterinary medicine applications. Evaluation and reporting of inventories of production and usage of CECs in all countries of Southeast Asia is a critical need, as is monitoring for their presence in the environment.

For more information see Bruce J. Richardson, Paul K.S. Lamm, and Michael Martin, *Emerging chemicals of concern: Pharmaceuticals and personal care products (PPCPs) in Asia, with particular reference to Southern China*, Marine Pollution Bulletin 50 (2005) 913–920.

A comparison of China's, Japan's, and Korea's chemical reporting requirements can be found at: http://www.cirs-reach.com/China_Chemical_Regulation/Comparing_Chemical_Reporting_in_China_Korea_Japan_Yunbo_Shi.pdf

SOUTH AFRICA

Despite considerable progress in water research undertaken over the past decade, the South African Water Research Commission (WRC) recognizes that more needs to be done to understand, assess and manage the risks associated with emerging contaminants in the environment. The WRC research program on CECs was formally launched in in 1999, and a strategic research plan was consequently developed and published by the WRC in 2005. Since then, there have been a number of related studies and a review in 2015.

The WRC, with other stakeholders, concluded there is need for a change in consumer chemical consumption behaviors in order to decrease exposure to emerging contaminants. For example, consumers should opt for safer alternatives of home and personal care products. There also needs to be drastic policy reforms, to ensure that human and environmental health aspects are taken into consideration (by conducting comprehensive health risk assessments) for any chemical products before its manufacture and introduction into the marketplace. Introduction of appropriate policies can also result in the correct labelling of products, such that the consumer is aware of the potential health effects of the product, and can in fact choose to use or not to use that product based on its chemical composition.

Additional information can be found at:
http://www.wrc.org.za/News/Pages/WRCattheforefrontofemergingcontaminantsresearch.aspx

APPENDIX E

Public Information about Toxic and Hazardous Wastes, Substance, Emerging Contaminants in Vermont

INTRODUCTION

With so many chemicals and substances being used in commerce, manufactured, transported, used, managed, and disposed of around the country, tracking and gathering data on these chemicals are critical activities that help to assess of risk posed by chemicals and facilitate responses to threats and emergencies. Information databases and other public sources of information are important to both governmental and regulatory bodies, but also to non-governmental entities and stakeholders, as well as citizens, in accessing information about chemical usage in their state or communities so they can make informed decisions about those risks. Providing accessible information to the public about regulated activities, emerging environmental issues of concern (such as contaminants of emerging concern, or CECs), and threats posed by these issues of concern is an important function of government, because it promotes transparency regarding governmental resources and priorities and facilitates informed public participation in regulatory efforts.

This appendix identifies the public informational resources regarding chemical and CEC usage and management in Vermont. Many of these resources exist and are administered here in the State, however, the federal government also maintains databases where state-specific information may be obtained. This list of informational databases and resources is not exhaustive. Readers and members of the public should also be aware that public records, information, and data are available for inspection and copying pursuant to the Vermont Public Records Law.

I. VERMONT INFORMATIONAL SOURCES

Many of the public informational databases and resources administered here in Vermont are associated with specific regulatory programs that address chemicals use or toxic or hazardous substances and wastes. Several of these regulatory programs are also addressed in *Appendix C* (Requirements for Reporting of Use, Management, and Responses to Releases of Toxic or Hazardous Wastes and Substances) and/or *Appendix D* (Requirements for Addressing Threats from Chemicals of Emerging Concern).

Vermont's Public Records Law (1 V.S.A. chapter 5) is available here:
http://legislature.vermont.gov/statutes/chapter/01/005

State Public Records Law (1. V.S.A. chapter 5)

It is the policy of the State and this law to provide free and open examination of records consistent with Chapter 1, Article 6 of the Vermont Constitution. The law states that "[A]ny agency, board, department, commission, committee, branch, instrumentality, commission, or authority of any political subdivision of the state" is obligated to provide access to public records for inspection and copying unless the records are exempt by law from public access.

Many regulatory agencies actively provide information and records through websites and on electronic databases. However, for information that is not made publicly-available, a member of the public may submit a request to inspect and copy those records and information to any

regulatory agency or other instrumentality that serves as custodian of those records and information. Requests for records may be made by regulatory bodies that have jurisdiction over and that maintain documents and information that is related to chemicals and toxics use, regulation, associated health effects, facility information, compliance information, and other scientific and regulatory information.

Vermont's Public Records Law (1 V.S.A. chapter 5) is available here: http://legislature.vermont.gov/statutes/chapter/01/005

Department of Health

- ***Essential Maintenance Practices (EMP) Compliance Database***

The Vermont Department of Health maintains an *Essential Maintenance Practices (EMP) Compliance* database. EMPs are required activities under the Vermont Lead Law, which requires owners of rental housing and child care facilities built before 1978 to take specific steps to keep the property lead-safe. The public can search to find out whether a rental property has an up-to-date EMP Compliance Statement on file, or if the property is exempt from filing.

The database is available electronically at: https://secure.vermont.gov/VDH/emp/

- ***Lead Poisoning Prevention Activities Report***

The Department of Health reports on an annual basis to the Vermont General Assembly on childhood lead poisoning prevention activities and blood lead data.

These reports can be accessed electronically by the public through the Department's website at: http://www.healthvermont.gov/environment/reports

- ***Environmental Health Tracking Portal***

The Vermont Department of Health maintains the *Environmental Health Tracking Portal* that provides information about chemical concentrations and childhood blood lead levels. The Portal also tracks naturally occurring arsenic, nitrates, radium and uranium; disinfection products, haloacetic acids (HAA5), and total trihalomethanes (TTHM); and atrazine, Di(2-ethylhexyl) phthalate (DEHP), tetrachloroethylene (PCE), trichloroethylene (TCE).

The public can access this site, and view and export data regarding chemicals in air and water and blood lead levels. http://www.healthvermont.gov/tracking/

- ***Chemicals of Concern in Children's Products (Act 188) Manufacturer Reporting Information***

The Vermont Department of Health administers the *Chemical Disclosure Program for Children's Products*, which requires manufacturers that use certain listed chemicals and certain threshold amounts of those chemicals in children's products that are sold or marketed in

Vermont. The program, created by Act 188 of 2014, requires that manufacturers report such chemical usage and information about the chemical and the chemical's use in the product to the State. All information reported by manufacturers on CHCC (that is not otherwise trade secret or confidential business information) is available to the public.

The public can download this information electronically from the Department's website, here: http://healthvermont.gov/environment/children/chemicals-childrens-products

Agency of Natural Resources

- ***Natural Resource Atlas***

One important new communication tool for the Agency of Natural Resources is the web-based *Natural Resources Atlas*. The purpose of the Atlas is to provide geographic information about environmental features and sites that the Vermont Agency of Natural Resources manages, monitors, permits, or regulates. The tool allows viewers to link from regulated or managed sites to documents regarding activities conducted on those sites (where available), generate reports, export search results, import data, search, measure, mark-up, query map features, and print PDF maps. Information made available through the Atlas includes waste management facilities; hazardous waste sites; brownfield properties; wetlands, rivers, and other water bodies; information related to wells and underground storage tanks, and other information.

The Natural Resource Atlas can be used to provide geospatial context to regulated activities, and enables the exploration of both environmental and land use data simultaneously. The Atlas can be accessed electronically through the Agency of Natural Resources' website, here: http://anrmaps.vermont.gov/websites/anra/

- ***PFOA and PFOS Contamination and Response Activities***

The Agency of Natural Resources, in conjunction with the Vermont Department of Health and other state and local entities, continues to address public health concerns and undergo testing and response actions in response to contamination of perflourinated compounds (PFCs) in public drinking water in various places through the State. Information on ANR's response to PFC, including health-related information, community updates, Area of Interest maps, sampling location maps, and public records related to ongoing response activities, can be found on DEC's PFOA Contamination Response webpage at: http://dec.vermont.gov/commissioners-office/pfoa

DEC's environmental divisions also maintain specified informational databases and other relevant sources of information specific to each division's work; some of these are described further below.

- ***Water Quality, Wastewater, and Discharge Information***

The Watershed Management Division within the Agency of Natural Resources, Department of Environmental Conservation makes available water quality data through the *Vermont Integrated*

Watershed Information System. The public can access water quality and chemistry testing information from throughout Vermont, including State Parks Swim Waste Testing and information on blue green algae testing, and other site-specific information.

The *Vermont Integrated Watershed Information System* can be found at: https://anrweb.vt.gov/DEC/IWIS/

The Watershed Management Division also maintains *Wastewater Inventory Database* which can be used to search for information regarding both direct and indirect discharge facilities. Facility information, permit information, and reports on unpermitted discharges and sewage overflows can be accessed through the database.

The *Wastewater Inventory Database* can be found at the following link: https://anrweb.vt.gov/DEC/WWInventory/Default.aspx

All NPDES monitoring data that is required to be reported monthly to the Department of Environmental Conservation is then uploaded to the Environmental Protection Agency's Integrated Compliance Information System for federal compliance oversight. Those data are subsequently uploaded to EPA's equivalent *Enforcement Compliance and History Online (ECHO)* site. The public can find permit data, inspection dates and findings, violations and enforcement actions, and penalties assessed against facilities. The public can also use data visualization tools and maps and display trends in compliance/enforcement, and identify pollution sources (including greenhouse gases, wastewater discharges, and toxic chemicals usage) throughout a larger area.

EPA's ECHO website, which houses Vermont-specific information and which is publicly-accessible, and can be found at: https://echo.epa.gov/?redirect=echo

- ***Information on Residuals and Septage Management in Vermont***

The Residuals Management Program within the WMPD has researched and written a publicly-available whitepaper, *Wastewater Treatment, Sludge, and Septage Management in Vermont* (September 2016), and an associated legislative report. The issue of pollutants, particularly those considered to be contaminants of emerging concern, have long been a concern to the program because of the volume of biosolids and septage that are managed via direct application to agricultural sites as nutrient supplements and soil conditioners. Major sections of the whitepaper specifically examine the transport and fate of such chemicals in an agricultural setting and assess their potential impacts on human health and the environment. The program is now responsible for residuals and emerging contaminants.

The *Wastewater Treatment, Sludge, and Septage Management in Vermont* whitepaper is available at: http://dec.vermont.gov/sites/dec/files/wmp/residual/RMS_White_Paper_2016_09_01.pdf

- ***Environmental Research Tool***

The Waste Management and Prevention Division within the Agency of Natural Resources' Department of Environmental Conservation maintained a list of properties being managed under the division's Sites Management Section. These properties include those that have been contaminated by releases of hazardous materials and where ongoing investigation and remediation activities may be occurring, other solid waste or hazardous waste facilities, salvage yard facilities, storage tanks, dry cleaners, and spills-related information. The *Environmental Research Tool (ERT)* allows access to documents and records related to specific site (e.g. site investigation reports); other information and documents not available through the tool may be available to the public for inspection and copying through the Vermont Public Records Law.

The *Environmental Research Tool* is available at:
https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx)

- ***Statewide Soil Report***

In accordance with Act 52 of 2015 (An act relating to the transportation and disposal of excavated development soils legally described as solid waste), the Agency of Natural Resources conducted a study (the *Statewide Soil Report*) to determine background concentrations of polycylic aromatic hydrocarbons (PAHs), arsenic, and lead from locations around the State that are presumed not to have anthropogenic sources of these compounds. Data gathered by the study and made available through the report may be used to differentiate hazardous material releases to the environment from background conditions for purposes of any necessary subsequent soil management.

The *Statewide Soil Report*, which includes sampling location maps, sampling results, and a regional assessment of data/results, is available electronically at:
http://dec.vermont.gov/sites/dec/files/documents/Vermont.Soil_.Full_.Report.pdf

- ***Air Monitoring and Air Toxics Information***

The Air Quality and Climate Division of the Agency of Natural Resources' Department of Environmental Conservation produces several informational resources related to air contaminants and emissions. The *Final 2016 Air Monitoring Network Plan*, which was finalized in July of 2016, represents a collection of data that must be gathered pursuant to the federal Clean Air Act. The Plan is utilized by the Agency of Natural Resources to determine compliance of State facilities with EPA's national ambient air quality standards (NAAQS) and Vermont's hazardous ambient air standards (HAAS).

The *Final 2016 Air Monitoring Network Plan* can be accessed electronically at:
http://dec.vermont.gov/sites/dec/files/documents/Vermont%202016%20Air%20Monitoring%20Network%20Plan%20Final%20_0.pdf

The Air Quality and Climate Division also produced the *Air Toxics Report* on existing hazardous air contaminants, identifies their sources and risks, provide information on exceedances of Vermont-specific air standards, and makes recommendations for the establishment of protective standards.

The *Air Toxics Report* can be found electronically at: http://dec.vermont.gov/sites/dec/files/documents/Vermont%202016%20Air%20Monitoring%20Network%20Plan%20Final%20_0.pdf

- ***Geological Information***

The Division of Geology and Mineral Resources with the Agency of Natural Resources conducts research and mapping related to the geology, resources, and topography of the State. The public can access this information through the division's website, including information related to groundwater and aquifers, and information related to negative impacts of bedrock, glacial materials, and soils on water quality, air quality, and public health.

Reports, maps, and data related to naturally-occurring arsenic, radioactivity, and other elements of concern in Vermont are posted on the division's site at: http://dec.vermont.gov/geological-survey

- ***Registered Pesticides in Vermont***

The Vermont Agency of Agriculture, Food, and Markets (AAFM) maintains two databases that provide information on pesticides that are registered for use in Vermont.

The first database provides public information compiled solely from the pesticide registration data submitted by companies who wish to sell their products in the State of Vermont. It combines this information with data from the EPA regarding ingredients, pests, and sites. The public can use the database by searching information by company name, product name, pest type, active ingredient or formula type, EPA or Company ID. The database is available at: http://www.kellysolutions.com/VT/pesticideindex.htm

The second database also provides information on registered pesticides in Vermont, as well as feed, lime, and fertilizer manufacturers. The public can search by company name or other identifier, see how each manufacturer entity is regulated, and search the brand name of each product sold by each manufacturer. The database is available at: https://usaplants.vermont.gov/USAPlants/ProductRegFSA/BrandSearch.aspx

Department of Public Service

- ***Emergency Planning and Community Right-to-Know (Tier II) Reporting Information***

The Department of Public Safety, Division of Fire Safety maintains the *Hazardous Materials Compliance Tier II Program* under the Emergency Planning and Community Right-to-Know Act

(EPCRA). The Division's website contains information about reporting, as well as updates on reporting requirement changes, for facilities required to report. Additionally, the website contains information on emergency response actions for state and local emergency planning committees and commission. This compliance-related information is available to the public through the Division's website at: http://firesafety.vermont.gov/emergency/tier2

Additionally, the following required information is made available to the public for review at local emergency planning committee locations, as well as the Vermont State Emergency Response Commission:

- Chemical Emergency Response Plans;
- Material Safety Data Information (MSDS);
- Follow-up Emergency Notices; and
- Hazardous Materials Releases & Inventory Reports (Tier II) forms.

I. FEDERAL INFORMATIONAL SOURCES

- ***The Toxic Substances Control Act Chemical Substance Inventory***

The *Toxic Substances Control Act (TSCA) Chemical Substance Inventory*, which is maintained by the Environmental Protection Agency, is a list of each chemical substance that is manufactured or processed, including imports, in the United States for uses under TSCA. EPA provides public access to the inventory where individuals can search and download the inventory for free, track changes in inventory information, and find scientific and regulatory information about chemicals on the inventory list. This and other TSCA-related information can be accessed on EPA's website at: https://www.epa.gov/tsca-inventory/how-access-tsca-inventory

- ***Integrated Risk Information System***

EPA's *Integrated Risk Information System (IRIS) Program* identifies and characterizes the health hazards of chemicals found in the environment. Each IRIS assessment can cover a chemical, a group of related chemicals, or a complex mixture. IRIS assessments are the preferred toxicity information used by EPA to set regulatory guidelines. Find the IRIS program at: https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system.

The IRIS searchable database can be found through EPA's website at: https://www.epa.gov/iris

- ***Substance Registry Services***

The *Substance Registry Service (SRS)* is the Environmental Protection Agency's (EPA) central system for information about substances that are tracked or regulated by EPA or other sources. It is the authoritative resource for basic information about chemicals, biological organisms, and other substances of interest to EPA and its state and tribal partners. The system provides the public and other users information about chemicals and biological organisms and their physical

properties, and EPA programs that track or regulate those substances, as well as other identifying information about chemicals and groups of substances.

The *Substance Registry Service* is found through EPA's website at: https://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do

- ***Pesticide Chemical and Product Label Search***

EPA's *Pesticide Chemical Search* is a public database offered through EPA's website that provides information on pesticide active ingredients. Users can enter the name of an active ingredient or Chemical Abstracts Service (CAS) Registration Number to find out information about regulatory actions related to that ingredient, scientific reviews and information, evaluation schedules, and public comment opportunities. The public can also obtain access to public dockets.

The *Pesticide Chemical Search* is available at: https://iaspub.epa.gov/apex/pesticides/f?p=chemicalsearch:1

EPA also provide a public, searchable database of pesticide product labels through the *Pesticide Product Label System (PPLS)*. Users can search for product active alternative brane names, company names, chemical names for active ingredients, and EPA Registration, Distributor Product, or Special Local Need Numbers for specific products. This database is available at: https://iaspub.epa.gov/apex/pesticides/f?p=PPLS:1

- ***Envirofacts***

EPA's *Envirofacts* database is a comprehensive database that provides public information from multiple sources, including these other EPA informational database: ICIS, ICR, RadNet, Toxic Reduction Inventory, RCRAInfo, and others. Information can be downloaded from the site. Searches can be conducted by topic, such as air, waste, land, radiation, compliance, facility, water, or "other".

EPA's *Envirofacts* database can be found at: https://www3.epa.gov/enviro/

- ***Toxic Release Inventory***

The *Toxic Release Inventory (TRI)* is one of the several individual databases that are made available through EPA's Envirofacts database. The TRI database allows access to basic facility information, forms submitted by facilities since 1987, aggregate chemical release data for all years reported, and relative risk information. Users can search by facility identification, by geographical location, standard industrial classification (SIC) code, and chemical name. Searches made may yield information from the TRI database only, or from a combination of other EPA databases.

The TRI database is available at: https://www.epa.gov/enviro/tri-search

- ***CERCLIS/Superfund Enterprise Management System***

The EPA has maintained the *Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)*, which contained a selected set of publicly-releasable Superfund program data. Recently, EPA announced that this database would be retired and replaced with the Superfund Enterprise Management System (SEMS). SEMS will include the same data fields and content as the prior CERCLIS database. This includes information about certain sites and locations, National Priority List (NPL) status of a site, contaminants present at a site, and certain information related to environmental indicators and activities (human exposure and ground water mitigation).

Information about the former CERCLIS database, and access to the new SEMS database, can be found at: https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm

- ***RADInfo***

Information available through EPA's *RADInfo* includes information regarding facilities that are regulated by EPA for radiation or radioactivity. This database is one of the several individual databases that are made available through EPA's Envirofacts database. The public can search by facility name, geographic location, and radiation regulation.

The *RADInfo* database may be found at: https://www3.epa.gov/enviro/facts/radinfo/search.html

- ***ChemView***

To improve chemical safety and provide more stream-lined access to information on chemicals, EPA has built the *ChemView database*. The database contains information that EPA receives and develops on chemicals, including those on EPA's Safer Chemical Ingredient List. The database currently contains information on approximately 12,000 chemicals, including TSCA substantial risk notices, health and safety studies, and high production volume information; EPA hazardous characterizations; integrated risk information assessments; information on current EPA actions, such as Significant New Use Rules and Consent Orders; and manufacturing, processing, use, and release data.

The searchable *ChemView* database can be found at: https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/introduction-chemview

- ***Pesticides Data Program***

The United States Department of Agriculture maintains the *Pesticide Data Program*, a national pesticide residue monitoring program. This program produces the most comprehensive pesticide residue database in the country. The data enables the EPA to assess dietary exposure of pesticide residue, facilitates global marketing of U.S. agricultural products, and provides guidance for the U.S. Food and Drug Administration and other governmental agencies to make informed decisions. Information about the program, fact sheets and other information for consumers,

standing operating procedures and analytical methods used by the Department, and annual summaries and reports dating back to 1992 are made available to the public.

The *Pesticide Data Program* website and information can be found at:
https://www.ams.usda.gov/datasets/pdp/pdpdata

APPENDIX F

Assessment of Vermont Civil Remedies

I. INTRODUCTION

The Act 154 Chemical Use Working Group was asked to "[e]valuate whether civil remedies under Vermont law are sufficient to ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused."[1] The working group carefully reviewed Vermont's civil remedies and determined that improvements to existing law can help ensure that the goals expressed in Act 154 are met. The working group also identified gaps, based on Vermont Supreme Court precedent, that could either lead to inadequate protection for Vermonters or create risks that persons responsible for toxic releases escape liability for any harm caused.

II. Tort Claims

Vermont courts currently recognize several tort claims that likely apply when there is a release of harmful chemicals: (1) negligence; (2) trespass; (3) private nuisance; (4) strict liability; and (5) products liability. These claims, as they relate to toxic exposure, are discussed in detail below.

A. Negligence

To bring a negligence claim, a plaintiff must prove that: (1) the defendant owed a duty of care to the plaintiff; (2) the defendant breached that duty of care; (3) the plaintiff was actually injured; and (4) the defendant's breach caused the plaintiff's injury.[2] If the plaintiff is unable to prove even one of these elements, the claim will fail. Thus, in a negligence claim, "there is no liability without a breach of a duty of care based on the defendant's conduct."[3]

Generally, courts look to industry standards and practices to determine if a manufacturer breached its duty of care.[4] If a manufacturer fell below industry standards in handling a particular chemical, courts will likely find that it breached its duty. But it is not always clear where to draw the line between actions that meet the standard of care and those that do not. For example, in cases involving chemicals of emerging concern, the chemicals may be unregulated or their toxicity not well understood. Similarly, in cases involving known chemicals, scientific understanding of their toxicity may evolve over time. In these cases, a manufacturer may avoid liability be complying with industry practices or other relevant standards, still cause harm to its neighbors, and avoid liability.

[1] Vermont Act No. 154 (H.595), § 10(b)(6).
[2] Demag v. Better Power Equip., Inc., 2014 VT 78, ¶ 6, 197 Vt. 176.
[3] Martin v. Christman, 2014 VT 55, ¶ 10, 196 Vt. 536.
[4] L. Cetrulo, Toxic Torts Litigation Guide § 2:3 (2016).

Several of these concepts are illustrated by *W. Greenhouses v. United States*. There, a landowner sued the federal government to recover damages for business losses and property damage caused by TCE contamination that migrated from an adjacent Air Force base into the plaintiffs' groundwater.[5] Applying Texas law, the court held that the government was not negligent because the contamination was not reasonably foreseeable when the acts that may ultimately have contaminated the groundwater were taken. The court stated that the government employees "did not know, and had no reason to know, that their acts could result in plaintiffs' property damages." The court highlighted the "travel time necessary for contaminants to reach plaintiffs' property," the "state of knowledge and the standard of industry practice" at the time in reaching its conclusion.

B. Trespass

Trespass occurs when a person invades or causes something to invade another person's property.[6] While air and groundwater pollution may satisfy these elements of trespass, the Vermont Supreme Court has not yet decided the issue.[7] In addition, there are a number of issues that have not been addressed by the Vermont Supreme Court that may complicate a trespass claim involving air or water contamination. When the Court is faced with an issue for which there is no precedent, it often looks to the Restatement (Second) of Torts[8] for guidance, and has done so in many of its prior trespass cases.[9] For example, according to the Restatement, the concept of negligence may become part of a trespass claim if a court finds the trespass was "unintentional." This means that if plaintiffs cannot show that the defendant acted recklessly or negligently—which may require plaintiffs to demonstrate the defendant breached its duty of care—the defendant may escape liability.

C. Private Nuisance

A private nuisance occurs when one person's activities interfere with another person's use and enjoyment of their property.[10] Although there can be some overlap between nuisance and trespass, trespass generally involves a physical invasion of the property, while nuisance may not.[11] To succeed on a nuisance claim, plaintiffs must show that the interference with their use and enjoyment of the land was both (1) unreasonable and (2) substantial.[12]

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[5] *W. Greenhouses v. United States*, 878 F. Supp. 917, 927 (N.D. Tex. 1995).
[6] Canton v. Graniteville Fire Dist. No. 4, 171 Vt. 551, 552 (2000).
[7] John Larkin, Inc. v. Marceau, 2008 VT 61, ¶¶ 13-14, 184 Vt. 207 (noting that Vermont law is silent on whether particulate matter may be trespass).
[8] The Restatement is a summary of common law across jurisdictions. When courts are faced with an issue for which there is no precedent, they may look to the Restatement for guidance or adopt it as their governing law.
[9] *Marceau*, 2008 VT 61, ¶ 13 (explaining that Court has looked to Restatement for guidance on trespass).
[10] Post & Beam Equities Grp. v. Sunne Vill. Prop. Owners Ass'n, 2015 VT 60, ¶ 24, 199 Vt. 313.
[11] *Marceau*, 2008 VT 61, ¶ 8.
[12] *Id.*

To determine if the defendant's interference is unreasonable, courts weigh the gravity of the harm against the utility of the defendant's conduct.[13] Courts consider several factors in conducting this balancing test, including whether the defendant's conduct is lawful or otherwise regulated.[14] Courts conduct a similar balancing test when considering claims of groundwater contamination under Vermont's statutory groundwater cause of action.[15] These factors include the nature and extent of the harm, the social or economic value of the activities, and the practicality of avoiding the harm, among others.[16] In the case of toxic exposure, if a chemical is not yet regulated or its toxicity not yet understood, courts may consider this as evidence that the defendant's conduct was reasonable.

Even if the court finds the conduct unreasonable, plaintiffs must still show that the interference is substantial, or "that of definite offensiveness, inconvenience or annoyance to the normal person in the community," terms that may be subject to inconsistent interpretation by the courts.[17] Due to the fact-specific nature of the "unreasonable" and "substantial" tests and their inherent uncertainty, responsible parties may escape liability for their releases of toxic and hazardous substances.

As with trespass, the Vermont Supreme Court has not expressly distinguished between intentional and unintentional nuisance, but the Restatement offers guidance on how the Court may decide the issue. According to the Restatement, a nuisance is intentional if the defendant purposefully or knowingly causes the interference, but the defendant need not intend to cause harm.[18] A nuisance is unintentional if the defendant negligently or recklessly causes the interference.[19] The Restatement also notes that groundwater contamination is typically *unintentional* because the course of groundwater is usually unknown and polluters may not be able to foresee the ultimate destination of the pollutants.[20] In many toxic release cases, groundwater contamination will be the source of the plaintiff's harm and may require the plaintiff to prove that the defendant's conduct was either negligent or reckless.

D. Strict Liability

Courts impose strict liability on defendants who engage in activities—such as blasting and housing wild animals—that are so abnormally dangerous, or ultra-hazardous, that no standard of care can protect individuals from harm.[21] Plaintiffs must still prove the defendant's actions caused their harm, as in negligence, but they need not show that the defendant owed any duty of

[13] *Post & Beam*, 2015 VT 60, ¶ 25 (citing Restatement (Second) of Torts § 826(a)).
[14] Paris v. Lussier, No. 2010-034, 2010 WL 7791942, at *4 (Vt. July 16, 2010) (unpub. mem.) (upholding trial court's conclusion that defendants' use of wood stove was not unreasonable and noting that court properly considered lack of regulation of wood stoves in Vermont as evidence of reasonableness).
[15] 10 V.S.A. § 1410(c).
[16] *Id.* § 1410(e).
[17] *Post & Beam*, 2015 VT 60, ¶ 24 (quotation omitted).
[18] Restatement (Second) of Torts § 825.
[19] *Id.* § 822.
[20] *Id.* § 832 cmt. f.
[21] Restatement (Second) of Torts §§ 507, 519, 520.

care or breached that duty. For example, if a house-guest is injured by a wild tiger, the courts may hold the owner of the tiger strictly liable, even if the owner took every precaution to prevent the harm. Vermont courts have not yet considered whether the use of toxic and hazardous substances is inherently dangerous or ultra-hazardous. To succeed on such a claim, plaintiffs would need to prove that there was no level of care in handling these substances that would have prevented the plaintiff's harm. If a plaintiff cannot prove this, the responsible parties may escape liability.

E. Products Liability

Under products liability, the seller or distributor of a defective product may be liable for the harm caused by that product. A plaintiff bringing a products liability claim must prove that the defendant's product (1) was defective; (2) was unreasonably dangerous to the consumer in normal use; (3) reached the consumer without undergoing any substantial change in condition; and (4) caused harm to the consumer because of the defect.[22] A product may be defective because of a manufacturing defect, a design defect, or lack of an adequate warning.[23] When a company sells a product containing a toxic or hazardous chemical without an adequate warning, a person harmed by that product may have a products liability claim against the company.

There are two ways the company that sold the toxic or hazardous chemical may escape liability. First, if the persons harmed by the toxic release are not *consumers* of the final product but merely innocent *bystanders*, the company will escape liability if the court does not recognize bystander liability. The Vermont Supreme Court has not yet decided whether to recognize bystander liability. Second, if the manufacturer of the product containing the toxic chemical is considered a "sophisticated user," such that courts presume they are aware of a particular chemical's toxicity and how to handle the chemical, the company that sold the chemical to manufacturer may escape liability.[24]

F. Medical Testing and Monitoring

The Vermont Supreme Court has yet to determine whether persons exposed to toxic substances must be compensated for the cost of medical testing and monitoring necessary to detect any latent diseases associated with their exposure as early as possible. These costs may therefore be borne by the person exposed instead of the person responsible for releasing the chemical into the environment.

II. Enforcement of Environmental Statutes

The Agency of Natural Resources and other state agencies are charged with enforcing environmental statutes, including those that govern the release of toxic chemicals into the

[22] *Id.* § 402A.
[23] *Id.*
[24] *See id.* § 388 (providing that supplier has duty to warn user of product's dangers only when user is neither aware nor should not be aware of dangers).

environment. When an agency discovers a violation, such as the unpermitted release of a toxic or hazardous substance, it may bring an action against the violator to enjoin the polluting activity and to impose a penalty on the violator. However, an agency's ability to discover each violation and bring an enforcement action is limited by staffing and budgetary constraints. Agencies must prioritize their efforts to ensure compliance with the law. The unfortunate consequence is that violations go unaddressed.

Many federal and state environmental statutes authorize ordinary citizens to fill this gap by filing what is known as a “citizen suit.” Vermont does not. Other than the private tort claims discussed above, Vermonters have no additional recourse under state law short of petitioning the agency to take action.

APPENDIX G

Majority Recommendations of the Act 154
Chemical Use Working Group

Appendix G

Majority Policy Recommendations

1. Interagency Committee; Expanded Reporting; Chemical Database
ANR, in consultation with multiple working group members

2. Funding for Interagency Committee
Lyndon State College

3. Act 100 Certified Planner Requirement
VPIRG, VNRC, VCV

4. Act 100 Expand List of Substances
VPIRG, VNRC, VCV

5. Ban PFASs Food Contact Substances/Dental Floss
VPIRG, VNRC, VCV

6. Make it Easier to Restrict/Label Chemicals of High Concern in Children's Products
VPIRG, VNRC, VCV

7. Expand Act 188 to Cover All Consumer Products
VPIRG, VNRC, VCV

8. Provide Greater Information on Chemicals and Hazardous Materials
VPIRG, VNRC, VCV

9. Improve Citizen Right to Know, Assess, and Address Risks of Contamination
VPIRG, VNRC, VCV

10. Citizen Suit Enforcement
VLS, VNRC, VPIRG

11. Medical Monitoring
VLS, VNRC, VPIRG

12. Strict Joint and Several Liability
VLS, VNRC, VPIRG

13. Testing of Private Water for Manmade Chemicals
Department of Health

Act 154 Working Group on Chemical Use in Vermont

Revised Policy Recommendation Proposal

Title: Creation of an Interagency Advisory Committee to Address Risks to Vermonters Posed by Chemicals; Expansion of Chemical Reporting Requirements; and Creation of a Comprehensive Chemical Database

Author(s): Agency of Natural Resources, in consultation with multiple working group members

Introduction:

A significant number of chemicals are manufactured, imported, transported, used, and disposed of daily in Vermont. One of the major problems identified by the Act 154 Working Group is a lack of data with respect to toxicity information and chemical use (volume and location) in Vermont. The State does not have a baseline understanding of all chemicals in use, and where they are used, within the State. Without this information, it is challenging for the State to respond to emergencies and threats posed by chemicals of emerging concern, and review and assess which chemicals the State should regulate. Additionally, a lack of a coordinated and streamlined approach to chemicals regulation among State agencies results in an inefficient and duplicative reporting system that can be difficult for businesses to navigate. Further, there is currently no electronic database that provides resources and chemical use data in an easy-to-digest format for Vermont businesses, agencies, and the public.

The Agency proposes to build upon the State's existing regulatory framework to streamline and expand chemical reporting requirements to include a broader suite of chemicals, including chemicals of emerging concern and other unregulated chemicals that have been detected in Vermont's environment; and to create an easy-to-use electronic database (or expand an existing database) that would facilitate industry reporting and assistance, provide data for agencies to review and use to inform prioritization of limited resources to address harmful chemicals, and provide data and guidance for the public about chemicals in their community. A new interagency committee will facilitate the review and expansion of chemical reporting requirements in the State, and will advise the State's regulatory agencies on actions and strategies to help address threats posed to Vermonters by chemicals.

Problem Definition:

There are over 109 million substances registered with the Chemical Abstract Service (CAS). Of these, approximately 85,000 chemicals have been approved for use under the Toxic Substances Control Act (TSCA). These 85,000 chemicals do not include insecticides, herbicides, rodenticides, pharmaceuticals, food additives, cosmetics, munitions, nuclear material, gases, and complex mixtures. These substances enter the air, groundwater, soils, and surface water in Vermont and may pose a threat to human health and the environment, yet for the vast majority of these chemicals, the State has little information about their toxicity and use in Vermont.

Although many of these substances are regulated in some way, the regulations vary dramatically in terms of achieving adequate protection of human health and the environment. For example,

the majority of chemicals are not subject to rigorous testing prior to being introduced into the marketplace, and potential threats to human health and the environment are not known. In other cases, certain chemicals and classes of chemicals are not subject to reporting and management requirements. The result of the current regulatory framework is that the State does not have complete baseline information about chemical use (i.e., volume, location, and toxicity) in the State. This information is critical to enable the State to effectively respond to emergencies and threats posed by chemicals of emerging concern, and to prioritize limited resources to address those chemicals that pose the greatest risk to Vermonters.

Additionally, several state agencies share authority over chemicals regulation, creating an inefficient and duplicative regulatory system, and making it challenging for businesses to navigate. Finally, it is difficult for the public to find current information about chemicals use and potential threats that may exist in their own communities because of the lack of comprehensive reporting requirements, and because the information that is currently available is difficult to find as it is not located in a single location.

Critique of Current Policies:

Emergency Planning and Community Right-to-Know (EPCRA); Tier II

Of the tens—if not hundreds—of thousands of chemicals in use today, only a fraction is subject to EPCRA (Tier II) reporting requirements. Organizations and businesses managing and using hazardous chemicals above certain quantities are required to submit Emergency and Hazardous Chemical Inventory Forms annually to the State to help agencies plan for and respond to chemical emergencies. The program includes substances which have been determined to be hazardous, but generally does not capture all substances that may pose a risk to human health and the environment, including chemicals in quantities below certain thresholds, chemicals in consumer packing, and individual chemicals in a mixture. Additionally, the State currently relies on an outdated electronic reporting system that can be challenging for businesses to navigate.

Vermont Occupational Safety and Health Administration; Hazard Communication Standard

Chemical manufacturers, importers, distributors, and employers are currently required to create and maintain an inventory of hazardous chemicals and the associated hazards to ensure chemical safety in the workplace. Though this regulatory program requires an inventory of most known chemicals in the work place, exemptions exist for non-hazardous chemicals, household consumer products, and some pharmaceuticals. Additionally, there is no requirement to provide inventory information, including hazard information, to the State. Many businesses throughout the State are limited in their understanding of the inventory requirements, lack established systems to develop and maintain complete chemical inventories, and the State has limited capacity to actively reach out to businesses to offer technical assistance.

Act 188 Children's Products

The Toxic Free Families Act of 2014 established reporting requirements and regulatory mechanisms to limit the use of chemicals in children's products. The Act enables the Commissioner of the Department of Health to take actions to require labeling and restrict use of chemicals, but only upon the recommendation of the Act 188 Working Group, which restricts the Department of Health's ability to address risks posed by chemicals in children's products. Additionally, Act 188 operates to regulate hazards using a chemical-by-chemical approach, and targets only one class of products (children's products).

Pesticide Reporting

The Vermont Agency of Agriculture currently tracks commercial use and sales of pesticides but does not capture sales to homeowners. Current pesticides policy captures information down to the county level for most commercial application types. Vermont receives more information than other states as we require all persons applying any pesticide product on the property of others to be commercially certified. This is not true in all other states. However, compiling and sharing meaningful pesticide use data has been a challenge for the Agency of Agriculture, and the Agency is unable to provide comprehensive, meaningful pesticide use data. As a consequence, and as pesticide chemistries have changed significantly over the past 20+ years, the Agency is limited in its ability to identify and compare changing risks to homeowners based on current volumes and toxicities.

Overlapping Jurisdiction

Recordkeeping and reporting requirements vary for each of the programs identified above, and reporting systems vary from agency to agency. As a result, many businesses can expend a significant amount of time and resources in an effort to comply with the different recordkeeping and reporting requirements when they are subject to more than one regulatory program. Further, because several agencies play a role in regulating chemicals, it can be difficult for regulated entities to stay on top of changing regulatory requirements.

Policy Recommendation:

The Agency proposes the following: (1) create an interagency committee to review chemical inventories and identify potential risks to Vermonters and the environment; (2) streamline and expand existing recordkeeping and reporting requirements to require users, manufacturers, importers, and distributors of chemicals to create and report inventories of all chemicals to the State on an annual basis; (3) create an easy-to-use electronic reporting system and regulatory guidance for businesses; and (4) create a new Natural Resources Atlas data layer with information on the use, manufacture, import, and distribution of chemicals in the State.

(1) **Create an interagency advisory committee to review and evaluate chemical inventories on an annual basis to identify potential risks to human health and the environment and measures to address those risks. Specifically, the new advisory committee will:**

   (a) be comprised of a representative from the Agency of Agriculture, Agency of Natural Resources, Department of Health, Department of Labor, and the Department of Public Safety;

(b) convene and consult with a policy advisory panel that will consist of members with expertise in: toxicology, environmental law, pollution prevention, environmental health, public health, risk analysis, maternal and child health care, occupational health, industrial hygiene, and public policy;

(c) identify an agency or agencies to create a streamlined electronic reporting system (or expand an existing) and develop guidance for businesses consistent with Item (3) below;

(d) develop streamlined reporting forms and guidance for businesses to help ensure compliance with existing and expanded reporting requirements via a single/unified reporting system

(e) track and notify the relevant State agencies of any "action" taken by EPA to regulate chemicals under the TSCA/Lautenberg Amendments that could affect any State regulatory decision;

(f) review chemical inventories on an annual basis and identify chemicals of high concern; and

(g) identify actions or strategies to reduce health risks from exposure to chemicals of high concern and risks of harm to the natural environment, including the development of regulatory standards, sampling of private drinking water supplies, and other necessary actions to protect Vermonters.

(h) The creation and duties of the interagency committee shall not limit the independent authority of the Agency of Agriculture, Agency of Natural Resources, Department of Health, Department of Labor, and the Department of Public Safety to regulate chemicals.

(2) **Require that users, manufacturers, importers, and distributors report inventories of all chemicals to the State on an annual basis.**

(3) **Direct the interagency committee to identify a lead agency or agencies to create a streamlined electronic reporting system (or improve/expand existing database) and regulatory guidance for businesses. Specifically, the reporting system will:**

(a) assist businesses with compliance with existing and expanded reporting requirements identified in Item 2 above; and

(b) provide information and guidance about regulatory requirements for specific chemicals (similar to CHEMLIST).

The interagency committee shall report on its progress to create the electronic reporting system on or before January 15, 2018.

(4) **Direct the Agency of Natural Resources to create a new Natural Resources Atlas data layer(s) with information on the use, manufacture, import, and distribution of chemicals in the State. Specifically, the new data layer(s) should provide information in a format that the public can easily access and is easy to understand, and will include information:**

(a) required pursuant to existing and expanded reporting requirements identified in Item (1) and Item (5) below regarding pesticide use; and

(b) required pursuant to Act 100, including individual progress reports and plan summaries for facilities subject to the planning requirements of Act 100.

(5) **Direct the Agency of Agriculture to expand pesticide use reporting requirements. Specifically:**

(a) expand pesticide use reporting beyond commercial applications and identify sales to consumers at the point of sale or distribution in the State in order to develop a more comprehensive understanding of and information regarding pesticide use throughout the State;

(b) improve existing data structures within the Agency of Agriculture to compile and provide meaningful data to the public; and

(c) coordinate and share pesticide use information and information regarding risks associated with pesticides used within the State with the interagency advisory committee and the public via the Natural Resources Atlas data layer(s) created through Item (4) above.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: Funding of toxicologist position to support and coordinate the interagency committee to review chemical inventories and identify potential risks to Vermonters and the environment

Author(s): Ian Balcom, PhD

Introduction:

This recommendation charges the legislature to fund staff positions to chair and actualize the recommendations identified by interagency committee on chemical inventories.

Problem Definition:

A significant obstacle to preemptively identifying risks associated with unregulated chemicals (emerging contaminants of concern) is the lack of centralized regulatory consideration. Currently, chemical hazards are addressed by a variety of mechanisms based on disparate considerations such as intended uses (pesticides), toxicological characteristics (persistent and bioaccumulative toxicants), or arbitrary historical time constraints (grandfathered chemicals under TSCA). This fractured approach has resulted in an inability to maintain a systemic view of the chemical risk landscape as it evolves with new chemicals entering the market and advancements in toxicology. However, a systemic view is required to predict emerging issues and prevent damage to human health and the environment driven by currently unregulated chemicals. While the formation of an interagency committee will advance formalize a deliberative body dedicated to this goal, without dedicated funding and personnel achieving protection from damages caused by emerging contaminants is unlikely.

Critique of Current Policy:

At current staffing levels, participation of existing staff on the interagency committee of chemical inventories will be significantly encumbered by a lack of dedicated staff time. Additionally, without allocating specific resources to the realization of the committee's recommendations, it is unrealistic to expect results.

Policy Recommendation:

This proposal recommends the funding of one senior staff FTE to support and coordinate the interagency committee on chemical inventories and one junior staff FTE to assist with the implement the committee's recommendations. Staffing should occur at a pay grade sufficient to attract individuals with high level of expertise. The legislature should explore funding options, including removing the fee caps outlined in Act 100, and should consider imposing additional fees on entities profiting from the use of contaminants of concern in Vermont.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: Institute a Certified Planner Requirement Under Act 100, and Improve Technical Assistance Available to Companies in Vermont.
Author(s): VPIRG, VNRC, VCV

Introduction: Vermont's Toxics Use Reduction Act (Act 100) has been effective at helping reduce the use of hazardous waste and toxic chemicals, but the program could be expanded to help address a number of the gaps identified by the Working Group. Four of the gaps identified by the Working Group are the lack of technical assistance, lack of planning best practices, lack of assistance to help avoid or limit chemical use, and lack of industry knowledge about their own chemical use. Vermont and Massachusetts have similar toxics use reduction laws in place, but Massachusetts has created a more robust infrastructure to support their program and assist reporting companies to develop stronger toxics use reduction plans. Massachusetts' toxics use reduction program offers best practices that could help prevent Vermonters' exposure to toxic chemicals and address these identified gaps in our toxics use reduction program.

Vermont should provide an increased level of technical assistance to companies, and ensure planning professionals are involved in the deployment of plans submitted under Act 100. With greater technical support and input from planning professionals, companies will be able to develop stronger plans that will reduce the use of toxic chemicals and hazardous substances.

Problem Definition: The Working Group identified a lack of technical assistance, lack of planning best practices, lack of assistance to help avoid or limit chemical use, and lack of industry knowledge about their own chemical use as gaps that should be addressed. The chemicals and hazardous materials that trigger reporting under Act 100 are known to have negative impacts on human health and the environment. Without improved support and planning we will not be as effective at reducing the use of toxic chemicals and hazardous waste.

Critique of Current Policy: Act 100 has helped significantly reduce the use of toxic chemicals and hazardous materials in Vermont, but our program could be expanded in order to provide greater support for reporting companies and help create stronger toxics use reduction plans. Our current toxics use reduction program does not offer significant up front planning assistance for companies that are required to file under Act 100. In Massachusetts their toxics use reduction program requires certified planners to sign off on all toxics use reduction plans to ensure they are meeting best practices. They also offer companies significant support through their Office of Technical Assistance (OTA). Officials in Massachusetts expressed the belief that requiring the involvement of certified planners in plan development, and offering technical assistance are two facets of their program that significantly improve the quality of toxics reduction plans, leading to decreased use of dangerous substances.

Policy Recommendation: Vermont and Massachusetts have similar toxics use reduction laws, but Massachusetts has created a more robust infrastructure to support their program and assist reporting companies to develop stronger toxics use reduction plans. Two significant differences

in these programs are the requirement that planners certified by the state sign off on plans before submission, and the level of assistance offered to companies through the Massachusetts Office of Technical Assistance (OTA). Vermont should require certified planners to sign off on all toxics use reduction plans, and offer more robust technical assistance through the Office of Environmental Assistance (OEA) to help reduce to the use of toxic chemicals and hazardous waste.

In Massachusetts every plan submitted under their Toxics Use Reduction Act must be approved and signed by a Massachusetts Department of Environmental Protection certified planner. These planners are required to pass a standardized examination and maintain a license by completing continuing education courses.[1] There are two different types of certified planners in Massachusetts. General Practice Planners that can act as consultants to multiple clients, assisting them with plan development and certification, and Limited Practice Planners that can certify plans only for the organizations that employ them. These planners play a different role from Vermont's OEA because they work in the preparation of the original plan, as opposed to reviewing the plan after submission. Program officials in Massachusetts see initial input on plan preparation as a valuable aspect of their program that helps produce higher quality plans.

Another way that Massachusetts helps reduce the use of toxic chemicals and hazardous waste is by offering significant planning support thorough their OTA. OTA offers free and confidential services to companies interested in reducing their use of toxic chemicals and hazardous waste. These services are available to companies required to file under the Toxics Use Reduction Act, as well as companies that are not required to file. OTA employees provide on-site technical assistance and evaluation of a company's processes, and prepare reports outlining steps that could be taken to reduce the use of toxic chemicals and hazardous waste.

The OTA has seven employees that support approximately 500 facilities. Vermont could use increased fees on reporting companies to hire dedicated employees in our OEA that would provide similar services and help companies reduce their use of toxic chemicals and hazardous waste. Approximately 60 companies currently report under Act 100, meaning we could likely offer a similar level of service with 2 full time employees dedicated to offering technical assistance.

Title: Expand the List of Substances that Trigger Reporting Under Act 100.
Author(s): VPIRG, VNRC, VCV

Introduction: Vermont's Toxics Use Reduction Act (Act 100) requires users of large quantities of hazardous materials and toxic chemicals to prepare and submit toxics use reduction plans, and report to the state on their progress reducing chemical usage. This program provides a valuable tool to reduce the use of dangerous substances, but it could be updated to address the lack of an inventory of chemicals used in Vermont, the lack of regulatory incentives for identifying safer alternatives, and to help reduce to the use of these substances.

[1] Massachusetts Executive Office of Energy and Environmental Affairs, *About Toxics Use Reduction (TUR) Planners*. http://www.mass.gov/eea/agencies/massdep/toxics/tur/about-toxics-use-reduction-tur-planners.html

Vermont's list of chemicals that trigger reporting was established by statute in 1991 and has not been updated since. Massachusetts has a similar and more comprehensive toxics use reduction program with a larger list of chemicals that trigger reporting, as well as lower reporting thresholds for substances that pose greater dangers. Other states have also done considerable work developing comprehensive lists of chemicals that pose a danger to humans and the environment. If Vermont were to expand the Act 100 reporting list, and lower reporting thresholds, we could help develop a better understanding of the toxic substances used in the state, create regulatory incentives to identify safer alternatives, and ultimately reduce toxics usage in the state.

Problem Definition: The Working Group found that under our current regulatory structure there is a lack of an understanding of chemicals used in Vermont, and inadequate regulatory incentives to transition to safer alternatives. Requiring companies to account for the hazardous and toxic substances they use, and plan on how they can reduce them will lead to greater awareness of these substances. The planning process also helps reporting companies identify ways that they could benefit from reducing their liabilities and improving their manufacturing processes.

Many companies will inevitably focus their planning efforts on chemicals that trigger reporting. A more limited chemical list can narrow the focus of reporting companies to a smaller subset of chemicals, even though many other chemicals of concern have been identified in other jurisdictions. Further, lower reporting thresholds for more dangerous substances provide an incentive for companies to focus on reducing their use.

Critique of Current Policy: Vermont's current list of chemicals that trigger reporting was established by statute in 1991 and has not been updated since. Massachusetts has a similar and more comprehensive toxics use reduction program with a larger list of chemicals that trigger reporting, as well as lower reporting thresholds for substances that pose greater dangers. Other states have also done considerable work developing comprehensive lists of chemicals that pose a danger to humans and the environment. If Vermont were to expand the Act 100 reporting list and lower reporting thresholds we could help reduce toxics usage, develop a better understanding of the toxic substances used in the state, and create regulatory incentives to identify safer alternatives.

Policy Recommendation: Vermont and Massachusetts draw their list of toxic chemicals that trigger planning and reporting under their toxic use reduction acts from Title III, Section 313 of the Emergency Planning and Community Right to Know Act.[2] Massachusetts additionally requires reporting of chemicals listed under the Comprehensive Environmental Response, Compensation, and Liability Act.[3] Massachusetts Toxics Use Reduction Act chemical list should

[2] Vermont Department of Environmental Conservation, *Vermont's pollution Prevention Planning Law*. http://dec.vermont.gov/environmental-assistance/pollution-prevention/plans, Massachusetts Executive Office of Energy and Environmental Affairs, *Massachusetts Toxics Use Reduction Act- Current Chemical List*, http://www.mass.gov/eea/docs/dep/toxics/approvals/chemlist.pdf

[3] Massachusetts Executive Office of Energy and Environmental Affairs, *Massachusetts Toxics Use Reduction Act-Current Chemical List*, http://www.mass.gov/eea/docs/dep/toxics/approvals/chemlist.pdf, Massachusetts Executive Office of Energy and Environmental Affairs, *About TURA Reporting and Fees.* http://www.mass.gov/eea/agencies/massdep/toxics/tur/about-tura-reporting-and-fees.html

be adopted under Vermont's Act 100. This list is more expansive than the current list in Act 100, and draws primarily from determinations made by the federal government.

Massachusetts also has lower reporting thresholds for companies that use persistent bioaccumulative toxics (PBTs), but Vermont does not. We should adopt Massachusetts reporting thresholds for PBTs as a starting point, and then allow the Secretary of the Agency of Natural Resources to lower reporting requirements for any chemical on the current reporting list via rule.[4] Massachusetts uses the EPA reporting thresholds, which is a standard that Vermont should adopt to maintain consistency with the federal government and in the region.[5] Lowering thresholds for PBTs will likely expand the universe of companies required to file under Act 100, and help create a more comprehensive inventory of chemicals used in the state, and incentives to transition to safer alternatives.

Next, we should also expand the list of chemicals covered by Act 100 to include the chemicals of high concern list under Act 188. Incorporating this list in Act 100 would require Vermont manufactures who are large users of toxic chemicals and produce children's products to report under both Act 100 and Act 188, and to plan for how they can reduce their use of toxic chemicals.

Finally, a more comprehensive candidate list that should be adopted under Act 100 would be the Initial Candidate Chemical List prepared by California's Consumer Safe Products Program.[6] This list was created by identifying Candidate Chemicals that are found on both the Hazard Trait Lists and Exposure Potential Lists created by statute. These lists of lists are put together by examining a comprehensive list of lists that identifies harmful chemicals. The Consumer Safe Products Program made initial determinations on priority products for regulation by examining products that contain chemicals found on the Initial Candidate Chemical List.[7] By drawing from chemicals found on the Initial Candidate Chemical List we will be able to build off substantial work done in other jurisdictions, as well as prioritize chemicals that pose greater danger to the public.

Expanding this list of chemicals that trigger reporting under Act 100 would address a number of the gaps identified by the Working Group, including creating a more comprehensive inventory of chemicals used in the state, creating incentives to transition to safer alternatives, and reducing the use of toxic chemicals and hazardous materials.

Title: Ban the Use of Poly and Perfluoroalkyl Substances (PFASs) From Food Contact Substances and Dental Floss.
Author(s): VPIRG, VNRC, VCV

[4] Massachusetts Executive Office of Energy and Environmental Affairs, *Massachusetts Toxics Use Reduction Act-Current Chemical List.* http://www.mass.gov/eea/docs/dep/toxics/approvals/chemlist.pdf
[5] US Environmental Protection Agency, *Summary of the Emergency Planning & Community Right-to-Know Act.* https://www.epa.gov/laws-regulations/summary-emergency-planning-community-right-know-act
[6] "ARCHIVE INITIAL CANDIDATE CHEMICALS LIST- December 11, 2014" http://www.dtsc.ca.gov/SCP/upload/12-11-14_Candidate-Chemicals-List_initial_archive-2.xlsx
[7] California Department of Toxics Substance Control, *What is the Candidate Chemicals List?* http://www.dtsc.ca.gov/SCP/CandidateChemicalsList.cfm

Introduction: Studies have shown that some PFASs disrupt normal endocrine activity; reduce immune function; cause adverse effects on multiple organs, including the liver and pancreas; and cause developmental problems in rodent offspring exposed in the womb.[8] Further, a panel convened to examine the impacts of long chain PFASs found probable links between these chemicals and 55 diseases, including 21 types of cancer.[9]

The Working Group identified a number of gaps that would be addressed by banning the use of PFASs from consumer products that are likely to increase oral exposure to these chemicals. These actions would embody a precautionary approach to protect Vermonters from chemicals that have a high potential to be dangerous to people and the environment. It would also allow the state to offer more protection than the federal government in an area of regulation excluded from TSCA.

PFASs are used to coat many products such as dental floss, microwave popcorn bags, cookware, and pizza boxes**.**[10] Recently the FDA has banned the use of three specific PFASs in food contact substances, and major chemical manufacturers agreed to phase out the production of PFOA and PFOS in the US by 2015.[11] These actions have led industry to substitute shorter chain PFASs for traditional longer chain PFASs in many of their products, and driven production of chemicals like PFOA and PFOS to places like China.[12] The shorter chain chemicals are intended to be less bioaccumulative, but many scientists believe they present the same dangers exhibited by longer chain PFASs.[13]

To address this issue the State of Vermont should ban PFASs from dental floss and food contact substances sold in the State. These actions would reduce Vermonters' exposure to potentially dangerous chemicals, and create incentives to transition to safer alternatives.

Problem Definition: PFASs such as PFOA and PFOS have been linked to a number of damaging health effects,[14] but as companies reduce their use of these chemicals they are being replaced with chemicals that share many of the same characteristics and have not been adequately tested for their safety.[15] Every day Vermonters are being exposed to potentially dangerous PFASs from numerous substances in consumer products that increase the likelihood of oral exposure, such as dental floss and food contact substances.

[8] National Institute of Environmental Health and Sciences, *Perfluorinated Chemicals (PFCs)* https://www.niehs.nih.gov/health/materials/perflourinated_chemicals_508.pdf
[9]*Poisoned Legacy: Ten Years Later, chemical safety and justice for DuPont's Teflon victims remain elusive*. David Andrews and Bill Walker. Environmental Working Group April 2015. http://static.ewg.org/reports/2015/poisoned_legacy/Poisoned_Legacy.pdf?_ga=1.266380679.868286109.1469477768 p. 11
[10]9at p. 9
[11] Environmental Working Group. F*DA Bans Three Toxic Chemicals From Food Wrapping – Too Little, Too Late* http://www.ewg.org/release/fda-bans-three-toxic-chemicals-food-wrapping-too-little-too-late, See 10 at p. 13
[12] The Intercept, *Under DuPont Bridge: The Teflon Toxin Goes to China*. Sharon Lerner, September 15 2016 https://theintercept.com/2016/09/15/the-teflon-toxin-goes-to-china/
[13] Environmental Health Perspectives, The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs) http://ehp.niehs.nih.gov/1509934/
[14] See 12
[15] See 12

The number one way that PFASs enter the body is through ingestion.[16] PFASs are used extensively in both food contact substances and dental floss for purposes such as grease proofing, and reduction of friction.[17] These uses of PFASs, especially in dental floss, can lead to oral exposure and ingestion. With greater oral exposure to these chemicals we are increasing the likelihood that we will see negative health impacts.

Critique of Current Policy: For new chemicals to be used in food contact substances manufacturers must submit a food contact notification to the FDA for review.[18] Manufacturers are required to submit toxicity data and a discussion of potential carcinogenicity for each chemical to which consumers may be exposed.[19] If there is a "reasonable certainty in the minds of competent scientist that substance is not harmful under the intended uses" the product will be allowed to be marketed.[20] The major flaw with this existing policy is that there is not sufficient scientific data on the wide array of PFOA and PFOS substitutes to determine their safety.[21]

Dental floss is classified as a class 1 medical device under the Food Drug and Cosmetic Act (FDCA). Under the FDCA, dental floss is not subject to a pre-market review unless it meets one of the criteria laid out in 21 CFR 872.9, none of which refer to evaluations of toxicity.[22] This has allowed the use of PFASs in dental floss with minimal, if any, review of the toxicity of the materials used to create the product.

Recently the FDA has banned the use of three specific PFASs in food contact substances, and major chemical manufacturers agreed to phase out the use of PFOA and PFOS in the US by 2015.[23] The time it has taken to enact any restrictions in the face of rising scientific evidence shows that the regulatory structure is insufficient to protect public health and identify threats from the wide array of chemicals used to replace PFOA and PFOS. Further, PFOA and PFOS have not been banned in the United States meaning these chemicals could still be present in products made by manufacturers who have not agreed to a voluntary phase out of their use, and in imported products. As we develop a better understanding of the safety of these chemicals we should take a precautionary approach and eliminate their uses in products that are likely to result in oral exposure, and can be regulated without being preempted by future EPA actions.

[16] Haug LS, Huber S, Becher G, Thomsen C. 2011. *Characterisation of human exposure pathways to perfluorinated compounds — Comparing exposure estimates with biomarkers of exposure*. Environment International. Volume 37, Issue 4. Pages 687-693.
[17] U.S. Environmental Protection Agency, Office of Research and Development
National Risk Management Research Laboratory. *Perfluorocarboxylic Acid Content in 116 Articles of Commerce.* Zhishi Guo, Xiaoyu Liu, and Kenneth A. Krebs. http://www.oecd.org/env/48125746.pdf p8,35,37
[18] 21 CFR 174.5 (d)(5)
[19]US Food and Drug Administration, *Regulatory Report: Assessing the Safety of Food Contact Substances* http://www.fda.gov/Food/IngredientsPackagingLabeling/PackagingFCS/ucm064166.htm
[20] 21 CFR §170.3 (i)
[21] Environmental Working Group, *Credibility Gap: Toxic Chemicals in Food Packaging.* http://www.ewg.org/research/credibility-gap-toxic-chemicals-food-packaging-and-duponts-greenwashing , Environmental Health Perspectives, *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)* http://ehp.niehs.nih.gov/1509934/
[22] 21 CFR §872.9
[23]Environmental Working Group, *FDA Bans Three Toxic Chemicals From Food Wrapping – Too Little, Too Late* http://www.ewg.org/release/fda-bans-three-toxic-chemicals-food-wrapping-too-little-too-late,

Policy Recommendation: We can more effectively protect Vermonters and the environment by reducing exposure to PFASs in products that can easily lead to ingestion. To achieve this goal the State of Vermont should ban the use of PFASs from food contact substances and dental floss.

PFASs are used in a number of food contact substances such as microwave popcorn, pizza boxes, cookware, and food wrappers that expose Vermonters to these chemicals on a daily basis.[24] They are also used to coat the dental floss that Vermonters use to clean their teeth.[25] Banning the use of PFASs in food contact substances and dental floss would help reduce Vermonters exposure to PFASs from ingestion, and help drive the market away from the use of PFASs in these products. A ban with meaningful penalties for non-compliance could have a major impact on Vermonters exposure to PFASs, and help create a market for safer alternatives that can achieve similar results without the use of harmful chemicals.[26]

State regulation of food contact substances and dental floss would not be subject to preemption by EPA action under TSCA. Food contact substances and dental floss are both regulated under the FDCA, which is exempted from TSCA regulation.[27] This presents state regulators with the opportunity to ban the use of these chemicals from food contact substances and dental floss in order to protect Vermonters from exposure.

Under proposed legislation food contact substances and dental floss would be defined based on their current dentitions in the FDCA. Food contact substances would be defined as "any substance intended for use as a component of materials used in manufacturing, packaging, transporting, or holding food if such use is not intended to have any technical effect on the food".[28] Dental floss would be defined as "a string-like device made of cotton or other fibers intended to remove plaque and food particles from between the teeth to reduce tooth decay".[29]

The legislation should prohibit the manufacture, sale, or distribution in commerce of any food contact substance, or dental floss that contains 0.35 micrograms of fluorine per square decimeter starting July 1st 2019. This language is derived from the Danish Ministry of Environment and Foods' recommended limit for the content of organic fluorine in food contact substances.[30] The legislation should also prohibit the substitution with carcinogens rated by the United States Environmental Protection Agency as A, B, or C carcinogens, or substances listed as known or likely carcinogens, known to be human carcinogens, likely to be human carcinogens, or suggestive of being human carcinogens, as described in the United States Environmental

[24]*Poisoned Legacy: Ten Years Later, chemical safety and justice for DuPont's Teflon victims remain elusive*. David Andrews and Bill Walker. Environmental Working Group April 2015. http://static.ewg.org/reports/2015/poisoned_legacy/Poisoned_Legacy.pdf?_ga=1.266380679.868286109.1469477768 p. 11 p. 17

[25] See 9

[26]Environmental Health News, *What's poppin' in Denmark? Popcorn with safer packaging.* http://www.environmentalhealthnews.org/ehs/news/2015/oct/denmark-chemicals-fluorinated-popcorn-solution-endocrine-disruptor

[27] 15 USC § 2602 (1)(B)(vi), 21 USC § 321 (s), 15 USC § 2602 (1)(B)(vi), 21 USC § 321 (h)

[28] 21 CFR §409(h)(6)

[29] 21 CFR § 872.6390 http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=872.6390

[30]Danish Ministry of Environment and Food, *Fluorinated substances in paper and board food contact materials* https://www.foedevarestyrelsen.dk/english/SiteCollectionDocuments/Kemi%20og%20foedevarekvalitet/UK-Fact-sheet-fluorinated-substances.pdf

Protection Agency's "List of Chemicals Evaluated for Carcinogenic Potential,". Further, it should prohibit replacing fluorinated compounds with reproductive toxicants that cause birth defects, reproductive harm, or developmental harm as identified by the United States Environmental Protection Agency.

Title: Make it Easier to Restrict and Label Chemicals of High Concern in Children's Products.
Author(s): VPIRG, VNRC, VCV

Introduction: The Toxic Free Families Act of 2014 (Act 188) created comprehensive reporting on the use of chemicals of high concern in children's products, and mechanisms to restrict and regulate the use of those chemicals in the state. Improving the ability of the Commissioner of the Department of Health (DOH) to take action to restrict the use of chemicals, and require labeling of products containing dangerous chemicals would address the insufficient labeling of chemicals in products, as well as reduce Vermonters' exposure to these chemicals.

Under Act 188, the Commissioner of the DOH can act to restrict the use of chemicals of concern in children's products, but only after receiving a recommendation from the Act 188 Working Group.[31] Act 188 also contains language that will make it difficult for the Commissioner to take action to restrict the use of a chemical, even when there is significant scientific evidence to support such an action. The state should change the role of the Act 188 Working Group to be advisory, and remove unnecessary hurdles to the Commissioner taking action to protect Vermonters' health.

Problem Definition: Our nation's broken regulatory structure allows the use of chemicals in consumer products without requiring the manufacturers to determine that the chemicals used in the products will be safe. Federal reforms will incrementally improve our regulatory process over time, but this will still be insufficient to address the threat posed to consumers, especially vulnerable populations like children. The public also has significantly less information about the chemicals used in consumer products than manufacturers, making it difficult for Vermont families to avoid dangerous chemicals.

Critique of Current Policy: Under Vermont's Act 188, the Commissioner of the DOH can act to require labeling, or restrict the use of chemicals of concern in children's products, but only after receiving a recommendation from the Act 188 Working Group.[32] Act 188 also contains language that will make it difficult for the Commissioner to take action to regulate chemicals, even when there is significant scientific evidence to support such an action. The current process in Act 188 presents unnecessary hurdles to enacting regulation that would protect vulnerable populations form dangerous chemicals.

Policy Recommendation: We should change the Working Group's role to be advisory, bringing the Group's function in line with the vast majority of Working Groups under the Agency of Human Services.[33] This change could be accomplished by striking "upon the recommendation

[31] 18 V.S.A. §1776 (d)(1)
[32] See 31
[33] 3 V.S.A §3003, Chapter 53 Human Services: **Advisory capacity** (a) All boards and commissions which under this chapter are a part of

of" in 18 V.S.A. §1776 (d)(1) and inserting the words "after consultation with." Along with a modification of the Working Group's role, there are four other fixes that would make it easier to protect vulnerable populations from exposure to toxic chemicals.

The first change would be to eliminate the words "degree of" from 18 V.S.A. §1774 (d)(1) and "weight of" from 18 V.S.A. §1774 (b). The practical effect of these changes would be to reduce the burden on the DOH as they determine when and how to move forward with efforts to protect children from toxic chemicals. Similar language to what is currently in statute has been used at the federal level to stall action by EPA on toxic chemicals. Industry groups have used this language to argue that new evidence is coming out soon, or has come out since a draft decision was issued, and action should be put on hold. This tactic has been used effectively by regulated industries to delay action for years. Further, both phrases could be used to challenge any decisions by the Commissioner and Working Group, and could lead to litigation and legal battles over whether these burdens of proof were met.

Further, we should change the wording "will be exposed to" to "potential for exposure" of toxic chemicals in children's products in 18 V.S.A. §1776 (d)(1)(A) and 18 V.S.A. §1776 (d)(2). The available scientific data on toxic chemicals in consumer products makes it very difficult to definitively demonstrate a specific exposure of a specific child to a specific chemical in a particular product. Typically public health programs look for potential or threatened exposures rather than relying on showings of actual exposure. The amended language makes this law more in line with similar legislation elsewhere. The chemicals on Vermont's list of chemicals of high concern to children have already gone through a battery of screenings that show they cause health impacts like cancer, neurological damage, and infertility. The listed chemicals also must be found through biomonitoring studies to be in people's bodies, air/dust, or in wildlife – so we know they are leaching out of products and people are being exposed to them.

Next, we should change the burdensome demonstration of a "probability" that exposure to a chemical of concern cause or contributes to an "adverse health impact" in §1776 (d)(1)(B) to instead require a demonstration that a safer alternative to the chemical exists. Requiring a finding that there is a "probability" that exposure to a toxic chemical could "cause or contribute to" disease will be extremely difficult for the Department or Working Group to prove.

This high burden could lead to either inaction by the Department, or extensive litigation by affected stakeholders. The word probability is a very distinct legal concept that means greater than 51%, or more likely than not. This standard is largely unprecedented in regulatory frameworks. Regarding safer alternatives, there is a wealth of knowledge and work available for the Department to tap into in order to make this process workable. For example, the Interstate Chemicals Clearinghouse maintains a database of available safer alternative assessments. We fully expect the Working Group would consider the technical and economic feasibility of those alternatives when determining if and how to move forward with regulating a chemical of high concern to children.

or are attached to the agency shall be advisory only, except as hereinafter provided, and the powers and duties of the boards and commissions, including administrative, policy making and regulatory functions, shall vest in and be exercised by the secretary of the agency.

Finally, if we want to reduce exposure to vulnerable populations we should adopt language from Oregon's Toxic Free Kids Act that requires an automatic phase out of chemicals of high concern from specific categories of children's products after they have been reported three times.[34] The categories covered by Oregon's law are products that are mountable, children's cosmetics and products that are marketed to children under the age of three.[35]

Title: Expand Act 188 to Cover all Consumer Products, and Require Reporting of Product Name and Universal Product Code (UPC).
Author(s): VPIRG, VNRC, VCV

Introduction: There is a large gap between what product manufacturers know about what is in their products, and what the public at large knows. In many cases the current reporting regimes are too limited to provide a full picture of the chemicals the public are being exposed to. Act 188 helps to address this by requiring product level reporting about the use of chemicals of high concern in children's products. This provides valuable information to consumers about the products they may consider buying. Companies reporting under Act 188 are required to provide a plain language description of the product model, the model's UPC, or both. Reporting requirements are limited to products intended to be used by children under twelve. Beyond these limitations, there are also further exemptions to reporting for specific categories of products, even if they are marketed to children under twelve. These policies provide consumers a limited understanding of the use of chemicals of high concern in consumer products. Refining the reporting requirements could create opportunities to better inform consumers about products that are being reported under Act 188.

Act 188 should be updated to phase in reporting for all consumer products, and the reporting requirements should be clarified in statute to require the plain language name of the product model as well as the product's UPC. These updates will give consumers a more comprehensive picture of the use of chemicals in commercial products, as well as increase their ability to identify these products when making purchasing decisions.

Problem Definition: There is a large gap between what product manufacturers know about what is in their products and what the public at large knows. In many cases the current reporting regimes we have in place are too limited to provide a full picture of the chemicals the public are being exposed to. This problem is derived in part from the fact that there are few requirements for manufacturers of consumer products to inform the public about the substances they use. The public needs more tools to help them make decisions about the products that they buy based off of their potential exposure to harmful chemicals.

Critique of Current Policy: Despite the valuable information gained from Act 188, the law's scope is limited and should be expanded to provide Vermonters with a greater understanding of the presence of chemicals of concern in their daily lives. The Act's reporting requirements are limited to products intended to be used by children under twelve. Beyond these limitations, there

[34] Oregon legislative Assembly, 2015 Regular Session, Senate Bill 478 §5(1)
https://olis.leg.state.or.us/liz/2015R1/Downloads/MeasureDocument/SB478
[35] Oregon legislative Assembly, 2015 Regular Session, Senate Bill 478 §5(1)(a)-(c)
https://olis.leg.state.or.us/liz/2015R1/Downloads/MeasureDocument/SB478

are also further exemptions to reporting for specific categories of products even if they are marketed to children under twelve. These policies provide consumers a limited understanding of the use of chemicals of concern in products used by the general public. Refining the reporting requirements could also create opportunities to better inform consumers about products that are currently being reported under Act 188.

Act 188 helps to better inform the public by building off of existing programs in other states, and requiring unprecedented product level reporting about the use of chemicals of concern in children's products. The required reporting under Act 188 provides valuable information to consumers about the products they may consider buying. The legislative language of Act 188 does not clearly indicate exactly what information is required to identify specific products, but these requirements have been clarified by the DOH through guidance documents. Companies reporting under Act 188 are required to provide a plain language description of the product model, the model's UPC, or both.[36]The Department has ensured that consumers get valuable information, and we should take this opportunity to make sure that these decisions are maintained as the program moves forward.

Policy Recommendation: Act 188 should be revised to phase in a reporting requirement for chemicals of concern in all consumer products, and require that manufacturers report both the product models plain language description and UPC. When the Toxic Free Families Act (now Act 188) passed the Vermont Senate it required disclosure from manufacturers of all consumer products when their products contain any of the identified chemicals of high concern. [37] In order to better inform Vermonters about the presence of chemicals of high concern in we should expand the scope of the reporting requirements in Act 188 to cover all consumer products.

We recommend striking the current language of 18 V.S.A. §1775(a) and inserting "No later than one year after a chemical is placed on the list of chemicals of high concern under section 1773 of this title, and biennially thereafter, a manufacturer of a consumer product shall submit to the Department the notice described in subsection (b) of this section if a chemical of high concern is used." Further, the statute should be amended by striking §1772(8)(h)-(j) that exempt consumer electronics and interactive software from the definition of consumer products. References to "children's product" should be replaced by the phrase "consumer product" throughout the statute, as well as replacing the term "chemicals of high concern to children" with the term "chemicals of high concern". Finally, the definitions for "child", "children's cosmetics", "children's jewelry" and "children's product" would be unnecessary and could be removed from the statute.

Act 188 could also be improved by ensuring consumers are provided information that allows them to make informed purchasing decisions. The DOH has begun to receive reports from manufacturers who use chemicals of concern in children's products, with all reports due by January 1st 2017. These initial reports led to clarified guidance from the DOH that requires manufacturers to report their product models by UPC, the name associated with that UPC, or

[36]Vermont Department of Health, *Chemical Disclosure Program Manufacturer Guidance*. October 2016. P.6 http://healthvermont.gov/enviro/chemical/documents/chemical_disclosure_program_manufacturer_guidance.pdf
[37] Vermont General Assembly, S.239 of 2014. http://legislature.vermont.gov/assets/Documents/2014/Docs/BILLS/S-0239/S-0239%20As%20Passed%20by%20the%20Senate%20(Unofficial).pdf

both.[38] We support this guidance and believe that it should be slightly expanded, and made explicit in statute. Specifically 18 V.S.A §1775(b)(2) should be updated to read "a description of the product or product component containing the chemical, including the description of the product model associated with the universal product code and the universal product code." This would allow consumers to look up products based on a natural language search, or through a UPC lookup database. These changes would also allow for the development of applications that would identify products reported to the state by scanning the barcode on consumer products. These changes would be a significant step toward honoring the public's right to know, and making it easier to inform the public about chemicals in products they are considering purchasing.

Title: Provide Greater Information to the Public About the Use of Toxic Chemicals and Hazardous Materials in Their Communities:
Author(s): VPIRG, VNRC, VCV

Introduction: There is a wide gap between what experts and industry officials know about the use of chemicals and what the public knows. There is also insufficient public access to chemical use related information that is reported. If there were more publicly available information about the presence of use of toxic chemicals and hazardous materials then citizens will have a greater ability to take steps to prevent exposure. The Agency of Natural Resources (ANR) currently retains significant data on the presence and use of toxic chemicals and hazardous materials, but there are inconsistencies in the ease with which the public can access this information. We should require greater transparency for data regarding the presence and use of dangerous substances in order to better inform the public. This could be accomplished in a number of ways including expanding the information available on the "ANR Atlas", providing greater access to data through the ANR website, and increased reporting to relevant legislative committees.

Problem Definition: There is a wide gap between what experts and industry officials know about the use of chemicals and what the public knows, as well as insufficient public access to chemical use related information that is reported. This lack of information leaves members of the public at a disadvantage when they are trying to limit their exposure to toxic chemicals.

Critique of Current Policy: The ANR currently retains significant data on the presence and use of toxic chemicals and hazardous materials, but there are inconsistencies with the ease with which the public can access this information. We should require greater transparency for data regarding the presence and use of toxic chemicals and hazardous materials in order to better inform the public.

Policy Recommendation: Companies that report under Act 100 are required to submit annual progress reports to the ANR and the Natural Resources Committees of the House and Senate. In practice companies now report to ANR and then ANR will provide a general report on reduction of hazardous materials and toxic chemicals to the legislature. We should require that ANR post

[38]See 36

all individual progress reports and plan summaries on their website, and submit all individual reports to the committees annually.

These reports should be used to help populate the ANR atlas with geo-locators for all companies that are required to report under the law. These identifiers should then link to the progress reports and plan summaries listed on the ANR website.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: **Improve Citizens Right to Know, Assess & Address Risks of Contamination**

Author(s): **Vermont Natural Resources Council (VNRC), Vermont Conservation Voters (VCV) and Vermont Public Interest Group (VPIRG)**

Introduction:

There is a gap in Vermont laws and policies regarding how citizens are informed about the risks posed by toxic substances in their communities. The PFOA releases in North Bennington are clear examples of this gap. In North Bennington, we only found out that PFOA had contaminated private wells because one person tested their well after hearing about PFOA contamination in nearby Hoosic Falls, New York. There is clearly a gap in our laws that did not allow the people in North Bennington to learn about the risks associated with PFOA, assess if their water might be at risk of contamination and should be tested, and ultimately address the contamination of their water by PFOA. Our proposal addresses this gap in information and provides tools to address the risks associated with the presence of these substances in Vermont communities.

Problem Definition & Critique of Current Policy

With proper information, the citizens of North Bennington may have been able to prevent the contamination. At a minimum, they would have been able to identify and address the impacts much sooner. Because the people of North Bennington did not have adequate, timely information for years after the contamination occurred, some residents have suffered serious health impacts. While Vermont must strive to reduce the use of harmful chemicals, the reality is these chemicals exist and Vermonters require as much information as possible to be able to make informed decisions and take action to protect themselves from the harm these chemicals can cause.

Currently, there is reporting of the use of toxic substances and hazardous waste through Title 10, Chapter 159 and to the Vermont Department of Emergency Management (VDEM) pursuant to the federal Emergency Planning and Community Right to Know Act (EPCRA). In addition, the Vermont Department of Health (DOH) collects information about toxics. For example, Title 18, Chapter 38A, which addresses chemicals of high concern to children, requires the submission of information about chemicals of high concern to DOH. As you can see, information is collected by separate Departments, in different formats, on different uses, and on different chemicals. None of these entities is providing the public with readily accessible information on the toxic substances and hazardous waste that might be contaminating the air, water, soil, or products in Vermonters homes.

Fundamentally, there is a lack of easily accessible comprehensive information that would allow Vermonters to evaluate the risks associated with the presence of harmful chemical in their communities. For example, information on the proximity of chemicals to groundwater, private wells, facilities that serve vulnerable populations such as children or the elderly, surface water, wetlands, and other natural resources would allow Vermonters to assess and respond to the risks of contamination in their communities.

Policy Recommendation

To address the gap in Vermont law described above, we propose the following:

- Consolidate the reporting of information about toxic substances, hazardous waste, and/or chemicals of concern within the Vermont Agency of Natural Resources (ANR). This would enable state government to more easily make the information about toxic substances, hazardous waste, and/or chemicals of concern available through the Natural Resources Atlas. The Natural Resources Atlas is an interactive mapping tool available on ANR's website that includes information about natural resources, water supplies, hazardous waste sites and other resources.

- Require ANR to clearly identify on the Natural Resources Atlas facilities where toxic substances, hazardous waste or chemicals of concern have been reported. Include information on the Atlas about the risks associated with these substances, how the substances are used, and the proximity of these substances to water supplies, groundwater and other natural resources.

- Populate the Natural Resources Atlas with the information already reported to the State of Vermont and with additional information gathered through improvements to the Vermont Toxic Use Reduction Act, which is set forth in Title 10, Chapter 159, Subchapter 2, as proposed by VPIRG, VNRC and VCV.

- Increase fees on toxic substances, hazardous waste, and/or chemicals of concern to fund additional staff necessary to collect information about these substances, improve the availability of the information on the Natural Resources Atlas and create a fund that could subsidize the cost of testing drinking water and

groundwater in areas where the risk of contamination of water supplies is determined by ANR to be high. Such action would be consistent with and supported by the obligation of the State of Vermont to manage and protect groundwater as a public trust resource, pursuant to Title 10, Chapter 48. Under Vermont law: "[i]t is the policy of the state that the groundwater resources of the state are held in trust for the public. The state shall manage its groundwater resources in accordance with the policy of this section, the requirements of subchapter 6 of this chapter, and section 1392 of this title for the benefit of citizens who hold and share rights in such waters." 10 VSA § 1390 (5).

- Require testing of private water supplies, e.g. wells, when property is transferred. Currently public water supplies are highly protected and regulated pursuant to Title 10, Chapter 56. However, there is no requirement that private wells be tested. In addition to the fund described above that would be used to test private wells at high risk of contamination, this initiative would ensure that private wells would at least be tested at the time title to property is transferred, and provide an additional mechanism for detecting contamination. This initiative is also consistent with and supported by the obligation of the State of Vermont to manage and protect groundwater as a public trust resource.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: **Citizen Suit Enforcement**

Author(s): **Ken Rumelt, Vermont Law School**
Jon Groveman, Vermont Natural Resources Council
Paul Burns, Vermont Public Interest Research Group

Introduction:

This Proposal addresses a gap related to the enforcement of existing environmental laws and regulations that are designed to minimize or eliminate exposure to toxic chemicals.[1] We recommend that the Legislature adopt a "citizen suit" provisions for toxic chemicals. This provisions will authorize affected Vermonters to enforce violations of environmental laws that govern toxic chemicals, when the State lacks the resources, capacity, or willingness to do so. We further recommend that the Legislature model Vermont's citizen suit provisions after federal analogs that balance the role of the government and citizens in enforcing environmental laws.

Problem Definition:

Congress recognized more than forty years ago that regulators have limited capacity and sometimes lack the willingness to enforce anti-pollution laws. It addressed this enforcement gap by including a citizen suit provision in many environmental statutes.[2] Since then, citizens across the country have successfully brought claims in federal court to bring polluters into compliance to protect public health and the environment.

States like Vermont have adopted anti-pollution laws and regulations that may be more protective than federal law or regulate gaps left open by federal law. For example, Vermont adopted more restrictive drinking water standards for perfluorinated chemicals than the U.S. Environmental Protection Agency. These and other more restrictive standards may be unenforceable through federal citizen suit provisions, thereby leaving toxic pollution un- or under-addressed.

Many states have followed Congress's lead and adopted citizen suit provisions authorizing citizen enforcement of state environmental law. However, Vermont is not among those states. Consequently, affected Vermonters must rely exclusively on state agencies to bring violators into compliance.

Critique of Current Policy:

[1] We do not address here the adequacy or sufficiency of the underlying environmental requirements.
[2] Congress included a citizen suit provision in the Clean Air Act, Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act; and the Toxic Substances Control Act.

Vermont's current policy requires Vermonters to rely on state agencies to enforce violations of pollution laws. This leaves Vermonters affected by toxic pollution potentially vulnerable if an agency is unable or unwilling to bring a violator into compliance.

Policy Recommendation:

Act 154 instructs the Working Group on toxic chemical use in the State to evaluate whether existing State and federal programs are sufficiently effective in preventing releases of toxic substances, hazardous wastes, or hazardous materials (collectively "toxic substances").[3] Consistent with the Legislature's instructions, we recommend the Legislature enact a citizen suit provision, modeled after federal counterparts, within Vermont's waste management statute and its groundwater protection statute.

Mechanics of a Citizen Suit

Notice: Citizen plaintiffs must first provide a 60-day notice of intent to sue to an alleged violator and relevant agency officials. This notice is intended to allow the violator and agency to address the violation without the need for citizen litigation. If the agency decides to enforce the violation, it can bring enforce the violation in court.

Diligent Prosecution Bar: If the regulator is "diligently prosecuting" enforcement of the violation in court it will bar the citizen suit. While barred from bringing her own lawsuit, a citizen may intervene in the agency's enforcement lawsuit. However, if the relevant agency does not "diligently prosecute" the violations, the citizen may file suit after 60 days in court.

Remedies: Citizen suits provisions authorize citizens to seek injunctive relief to bring the violator into compliance. They also authorize citizens to seek penalties for violations that are payable to the treasury. Citizens may not, however, sue for money damages for harm to their person or property; and because money damages are not available, citizen suit provisions typically authorize citizen plaintiffs to recover attorney fees and costs if they are successful. This is a critical feature of citizen suits because lawsuits are costly. Without the possibility of an award of money damages, the possibility of attorney fees and costs provide the only economic incentive for attorneys to bring a citizen suit claim.

Federal citizen suits also typically authorize citizens to compel agencies to perform nondiscretionary duties. These citizen suits often focus on missed deadlines.

Vermont Statutes

Various Vermont laws address toxic chemicals, hazardous materials, or hazardous wastes. After considering these statutes, we recommend adding a citizen suit provision to Vermont's waste management law and the groundwater protection law. Except when in compliance with a State or federal permit, Vermont's waste management laws prohibit the "release of hazardous

[3] Act 154 § 10(b)(2)(A).

materials into the surface or groundwater, or onto the land of the State . . . ."[4] The term "hazardous materials" is defined to include CERCLA "hazardous substances"; petroleum, including crude oil or any fraction thereof; and "hazardous wastes" as defined under Vermont law.[5] The term "release" is defined broadly to include "any intentional or unintentional action or omission resulting in the spilling, leaking, pumping, pouring, emitting, emptying, dumping, or disposing of hazardous materials into the surface or groundwaters, or onto the lands in the State. . . ."[6]

A citizen suit provision in Chapter 159 would give ordinary Vermonters a significant tool to prevent or mitigate exposure to toxic substances. In particular, Chapter 159's prohibition on toxic releases is broad enough to encompass any release into the environment. Affected Vermonters could then sue to stop the pollution in the absence of action by state agencies. Vermonters could also enforce other violations of Chapter 159's requirements, including any permit violations, that are designed to protect human health and the environment.

Citizen suits are eminently practical and feasible. A citizen suit provision requires no additional allocation of resources for state programs or agencies because citizens, not the state, take the lead on enforcement. Indeed, one of the main purposes of a citizen suit provision is to address the enforcement gap created by financial and capacity constraints.

The citizen suit provision would specifically authorize a suit against any person who is alleged to be in violation of § 6616 of Title 10, V.S.A.; or is alleged to be in violation of a permit, condition standard, limitation, or order issued under Title 10 for the release of a hazardous material, as defined in 10 V.S.A. § 6602.

[4] 10 V.S.A. § 6616.
[5] 10 V.S.A. § 6602(16)(A). *See also* 42 U.S.C. § 9601(14) (CERCLA definition of "hazardous substance) and 10 V.S.A. § 6602(4) (Vermont definition of "hazardous waste").
[6] 10 V.S.A. § 6602(17).

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: **Medical Monitoring**

Author(s): **Ken Rumelt, Vermont Law School**
Jon Groveman, Vermont Natural Resources Council
Paul Burns, Vermont Public Interest Research Group

Introduction:

This Proposal addresses a gap in Vermont's civil remedies for individuals who, due to their exposure to toxic chemicals, must bear the costs of medical tests and monitoring for latent diseases and other ailments. No statutory provision for medical monitoring presently exists in Vermont, and the Vermont Supreme Court has yet to consider whether individuals may recover such damages under the common law absent a physical injury. As discussed in more detail below, we recommend that the Legislature create a statutory provision authorizing individuals to recover the costs of monitoring for latent diseases due to their exposure to toxic chemicals. A statutory provision will eliminate uncertainty in the common law, thereby ensuring a remedy for individuals and shifting the burden of medical monitoring expenses from harmed individuals and the state onto the responsible parties.

Problem Definition:

Toxic chemicals have been linked to a range of diseases and other ailments, including cancer, heart disease, thyroid disease, ulcerative colitis, and immunotoxicity.[1] Individuals exposed to toxic chemicals may not suffer from any present physical injury, and symptoms of the related diseases are often substantially delayed. Nonetheless, the exposure increases their risk of developing diseases and other ailments. To minimize the impact of the disease, those exposed must undergo periodic medical testing in order to detect these latent diseases and other ailments at the earliest stage possible.

Currently, state and federal laws governing hazardous materials, hazardous wastes, and toxic chemicals, such as the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), do not allow individuals to recover damages, including medical monitoring expenses. Generally, these laws focus on controlling and preventing the harmful effects of these substances and provide no avenue for recovery for those exposed. Instead, those individuals must seek recovery under traditional tort law. However, the Vermont Supreme Court has not yet considered whether individuals exposed to toxic chemicals can recover for these damages.

[1] These are the adverse health effects linked to perfluorooctanoic acid (PFOA).

Critique of Current Policy:

Due to this gap in Vermont law individuals exposed to toxic chemicals may not be able to recover expenses for medical monitoring absent a physical injury, thereby delaying detection of latent diseases at an early stage when treatment or other planning will minimize or mitigate impacts. Addressing this gap will help ensure that Vermonters can recover these costs without incurring the delay and expense of an appeal to the Vermont Supreme Court.

Policy Recommendation:

We recommend that the Legislature enact a statutory provision authorizing individuals to recover the expense of monitoring for latent diseases and other ailments based on a defendant's tortious conduct. A carefully drafted statute will help ensure that recovery is available for all individuals exposed to toxic chemicals and provide certainty on the scope and mechanics of the remedy.

Components of the Statute

The purpose of the medical monitoring statute is to eliminate the uncertainty surrounding the availability of medical monitoring damages under Vermont law. To avoid unnecessary litigation, the statutory language should avoid ambiguity for attorneys and the courts, but allow flexibility to accommodate for emerging science, new tort laws, and other unforeseen issues.

Who May Recover: Individuals who have been exposed to toxic substances as a result of a defendant's tortious conduct and, due to their exposure, have an increased risk of developing diseases, ailments, or other physiological changes may recover medical monitoring damages.

What Toxic Substances: Individuals should be able to recover when exposed to substances at concentrations linked to diseases, ailments, or other physiological changes, according to available science. The Legislature should not limit recovery for exposure to substances identified as toxic at the time of enactment, or otherwise listed as toxic or hazardous under state or federal law.

What Conduct: Individuals should be able to recover for any tortious conduct that caused the harmful exposure and the resulting increased risk of disease.

Distribution of Award: Courts should place the award of medical monitoring damages into a court-supervised program administered by medical professionals. This will help ensure that individuals use the award for its intended purpose.

Attorney's Fees and Costs: Because the medical monitoring award will be placed into a court-supervised program, the statutory provision should allow successful plaintiffs to recover attorney's fees and costs. Without this provision, litigation will be prohibitively expensive.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: **Strict Joint and Several Liability with a Right to Seek Contribution**

Author(s): **Ken Rumelt, Vermont Law School**
Jon Groveman, Vermont Natural Resources Council
Paul Burns, Vermont Public Research Interest Group

Introduction:

The Vermont Legislature tasked the Working Group to evaluate "whether civil remedies under Vermont law are sufficient to ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused."[1] Consistent with this charge, we identified two significant gaps in Vermont law on this topic. First, Vermont law does not clearly establish strict liability for harm caused by the release of toxic chemicals into the environment.[2] The lack of strict liability means that persons responsible for toxic releases may not have to pay for the harm they caused. The risk that such a party escapes liability is likely even greater when dealing with emerging toxins, where the harm may not have been foreseeable. Second, chemical manufacturers are likely to avoid liability for chemicals released into the environment by third parties. Yet in some cases, chemical manufacturers may be responsible for the release by failing to warn third parties of the chemical's harmful properties.

To address these issues, we recommend that the Vermont Legislature establish strict joint and several liability for the release of toxic chemicals. This liability regime will ensure the persons harmed by a release will be fully compensated, that parties responsible for the harm will be held liable, and that risk of liability will encourage safer behavior to help ensure that "private individuals are adequately protected." In addition, we propose that any party found strictly liable can seek contribution from other parties that bear responsibility for the harm, including chemical manufacturers that failed to warn of the chemical's propensity to cause harm when released.

Problem Definition:

The release of toxic chemicals into the environment can significantly harm private citizens physically and financially. For example, exposure to toxic chemicals can lead to debilitating medical conditions that result in high medical costs, pain and suffering, and lost income or an inability to work. Similarly, the value of one's home can drop considerably if contaminated, causing significant financial distress for the homeowner. Act 154 recognizes that civil remedies are potentially available to Vermonters affected by toxic releases, but that these remedies may

[1] Act 154 § 10(b)(6).
[2] As used in this proposal, "toxic chemicals" also includes hazardous materials and hazardous wastes.

not adequately protect citizens from releases, require those responsible for the harm to pay, or both.

Critique of Current Policy:

Vermont law does not clearly establish strict liability for harm caused to private citizens by the release of toxic chemicals into the environment. The lack of strict liability means, in the words of Act 154, that persons responsible for toxic releases may not pay for the harm they caused. For example, under Vermont's common law of negligence, parties that release toxic chemicals are liable for the harm caused only if they owed the persons harmed a duty of care and their breach of that duty proximately caused the harm.[3] The existence of a duty of care depends in part on whether the harm is foreseeable. The risk that a party escapes liability is likely even greater when dealing with emerging toxins, where the harm may not have been foreseeable.

There are several high-profile examples of industries withholding information from the public about significant health risks from their products. News reports indicate that manufacturers of PFOA knew it was harmful to human health as early as the 1960s.[4] Such manufacturers may escape liability even though they may bear some degree of responsibility for the handling of their chemicals, particularly if they fail to warn customers of the chemical's' propensity to cause harm.

Policy Recommendation:

To ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused, we recommend that the Legislature:

- Adopt strict joint and several liability for toxic chemical releases. Strict joint and several liability will ensure that persons responsible for releases of toxic chemicals will be held liable for any harm caused.

- Allow parties held liable for toxic chemical releases to seek contribution from any other responsible party, including chemical manufacturers for failing to warn of the chemical's propensity to cause harm when released.

- This proposal will ensure that parties responsible for toxic releases fully compensate those harmed, encourage safer behavior by chemical manufacturers and their customers, and place the burden on responsible parties to apportion liability.

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[3] A person responsible for the release of a toxic chemical (defendant) is liable if: (1) the defendant owed a legal duty to the plaintiff; (2) the defendant breached that duty; (3) the plaintiff was actually injured; (4) and the defendant's breach was the proximate cause of the plaintiff's injury.

[4] The Lawyer Who Became DuPont's Worst Nightmare, The New York Times Magazine, Nathaniel Rich, Jan. 6, 2016, http://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html?_r=0.

- This proposal is both practical and feasible. Establishing strict joint and several liability with the right to contribution does not require any additional resources from the state. Moreover, the proposal is similar to the liability framework created under the Comprehensive Environmental Response, Compensation, and Liability Act (CERLCA), which establishes strict joint and several liability for costs incurred remediating toxic waste sites.

Act 154 Working Group on Chemical Use in Vermont

Policy Recommendation Proposal

Title: **Testing of private water for manmade chemicals**
Author(s): **Vermont Department of Health**

Introduction:

This section should include a brief summary of (1) the problem (i.e. gap, inefficiency, or other issue identified by the Act 154 Working Group); (2) the current policy; (3) why the current policy should be changed; (4) the policy recommendation; and (5) how the recommendation will address the problem.

- The Problem
  - While public drinking water systems are required to tested for naturally-occurring and manmade chemicals, and many homeowners test for naturally occurring-contaminants, private water systems are not generally tested for manmade chemicals.
  - Potentially injurious manmade chemicals, such as PFOS and PFOA, may be present in private drinking water systems and domestic wells, but are not routinely tested.
- The Current Policy
  - The current policy in the State of Vermont is to not require homeowners to test their private drinking water nor does the State does currently provide cost-free testing to homeowners.
  - DEC tests private drinking water supplies that are potentially impacted by known contaminated sites but many sites, or other sources of exposures are likely unknown.
- Why Policy Should be Changed
  - There is a threat to human health due to drinking water that is contaminated with harmful manmade chemicals.
  - Many chemicals can be present in groundwater or drinking water without any obvious taste or odor and are not otherwise detected.
- Recommendation
  - The State should adopt a methodologically-sound sampling program that would test private water system across Vermont in order to detect possibly injurious manmade contaminants.
  - The Department of Health should build the capacity of the Department's laboratory to test for more manmade chemicals.
- How it addresses the problem

    - Such a program would provide detection of dangerous chemicals and allow the public and the State the necessary information to prevent injury and provide treatment for such exposures.
- Conclusion
    - The action addresses several values of the workgroup, including identifying and addressing gaps in regulatory oversight, prioritizing regulatory gaps based on the potential for human exposure, allowing government to do more to prevent exposure and harm, proactively identifying and addresses emerging chemicals of concern, preventing another PFOA-related incident, and informing the public about chemicals to which they are potentially exposed.

Act 154 Chemical Use Working Group
Meeting Minutes: Nov. 17, 2016

The Montpelier Room, Agency of Natural Resources Offices
1 National Life Drive, Montpelier, Vermont
Facilitated by Jen Duggan, ANR General Counsel

1. The meeting convened at 12:35pm with introductions and review of the agenda by Agency of Natural Resources (ANR) General Counsel Jen Duggan.

2. Paul Burns moved to approve the minutes from the November 1, 2016 meeting. Martin Wolf seconded the motion. The November 1st meeting minutes were unanimously approved with no further discussion.

3. Ken Rumelt discussed the revised citizen suit proposal put forth by Vermont Law School. The group discussed the benefits of and concerns related to the proposal.

4. Ian Balcom discussed his revised proposal for funding to provide staff support for an interagency committee charged with the review of chemical inventories and identification of actions and strategies to minimize potential risks to Vermonters and the environment from chemicals. The revised ANR proposal incorporates some of his initial proposal. The discussion was opened to any further questions on the proposal; none were asked.

5. Jen Duggan discussed the revised proposal from the ANR regarding reporting of annual chemical inventories, creation of an interagency committee to review chemical inventories, and creation of a comprehensive chemical database. Prior to the November 17th meeting, ANR had consulted with several working group members to produce a revised proposal that combined and expanded on several themes identified in many of the other draft policy proposals discussed at the November 1 meeting. The group discussed the benefits of and concern related to the proposal.

6. The Working Group accepted questions and comments from Nat Shambaugh, an interested member of the public in attendance.

7. The group took a break and engaged in informal discussion of the policy recommendations prior to the policy selection process.

8. Three proposals (Ian Balcom, Agency of Natural Resources, and Vermont Law School – Citizen Suit Enforcement) were revised during the informal discussions; the revisions were presented and discussed with the entire working group after the break and prior to the selection process. The proposal authored by Seventh Generation staff was withdrawn because the policy recommendations made in the proposal were reflected in other proposals.

9. The group then participated in the policy selection process. With respect to the thirteen policy recommendations proposed for consideration, the working group members had three options: (1) support the proposal; (2) oppose the proposal; or (3) not take a position on the proposal at this time. It was also clarified that members could indicate either whole support or partial support (i.e., support of specific provisions of a recommendation). In order to qualify as a majority recommendation, at least 11 out of the 20 working group members must fully support

the proposal. See below for results of the policy selection process. If a working group member is not identified in connection with a policy recommendation below, the working group member chose not to take a position on the proposal at this time.

(1) Creation of an Interagency Advisory Committee to Address Risks to Vermonters Posed by Chemicals; Expansion of Chemical Reporting Requirements; and Creation of a Comprehensive Chemical Database (ANR)

16 full support: Agency of Natural Resources (ANR), Vermont Conservation Voters (VCV), Planned Parenthood of Northern New England (PPNNE), Ian Balcom (Balcom), Burton Snowboards (Burton), Department of Public Service (DPS), UVM Medical Center (UVM), Vermont Department of Health (VDH), Seventh Generation (7th Gen), Agency of Agriculture (AAFM), Department of Labor (DOL), Vermont Law School (VLS), Toxics Action Center (TAC), Vermont Natural Resources Council (VNRC), Vermont Public Interest Research Group (VPIRG), Lake Champlain International (LCI)

3 partial support: Agri-Mark support sections (1) & (3); Associated Industries of Vermont (AIV) support sections (1) & (3); Global Foundries (GF) support sections (1)(a) & (1)(b) and streamlining reporting

1 partial oppose: AIV oppose sections (2), (4), (5)

(2) Funding of toxicologist position to head interagency committee to review chemical inventories and identify potential risks to Vermonters and the environment (Ian Balcom)

13 full support: ANR, VCV, PPNNE, VDH, UVM, AAFM, VNRC, TAC, VPIRG, DPS, VLS, Balcom, DOL

2 oppose: AIV, GF

(3) Institute a Certified Planner Requirement Under Act 100, and Improve Technical Assistance Available to Companies in Vermont (VPIRG, VNRC, VCV)

14 full support: ANR, VCV, PPNNE, VDH, UVM, VNRC, LCI, DOL, TAC, VPIRG, Agri-Mark, DPS, Balcom, VLS

2 oppose: AIV, GF

(4) Expand the List of Substances that Trigger Reporting Under Act 100 (VPIRG, VNRC, VCV)

14 full support: ANR, VCV, PPNNE, VLS, Balcom, UVM, VNRC, LCI, DOL, TAC, VPIRG, VDH, Agri-Mark, DPS

2 oppose: AIV, GF

(5) Ban the Use of Poly and Perfluoroalkyl Substances (PFASs) From Food Contact Substances and Dental Floss (VPIRG, VNRC, VCV)

11 full support: VCV, VLS, DPS, Balcom, PPNNE, VNRC, UVM, LCI, TAC, VPIRG, Global Foundries

1 oppose: AIV

(6) Make it Easier to Restrict and Label Chemicals of High Concern in Children's Products (VPIRG, VNRC, VCV)

14 full support: ANR, VLS, VCV, DPS, PPNNE, Balcom, VNRC, LCI, UVM, Seventh Gen., DOL, TAC, VDH, VPIRG

2 oppose: AIV, GF

(7) Require Act 188 to Cover all Consumer Products, and Require Reporting of Product Name and Universal Product Code (UPC) (VPIRG, VNRC, VCV)
12 full support: VLS, DPS, VCV, Balcom, LCI, UVM, 7th Gen., DOL, TAC, PPNNE, VPIRG, VNRC
2 oppose: AIV, GF

(8) Provide Greater Information to the Public about the Use of Toxic Chemicals and Hazardous Materials in Their Communities (VPIRG, VNRC, VCV)
13 full support: DOL, VCV, PPNNE, VPIRG, ANR, VLS, LCI, Seventh Gen, VNRC, DPS, TAC, VDH, Balcom
2 oppose: AIV, GF

(9) Improve Citizen Right to Know, Asses and Address Risks of Contamination (VPIRG, VNRC, VCV)
11 full support: VPIRG, VCV, PPNNE, VLS, LCI, UVM, VNRC, DPS, Balcom, TAC, 7th Gen
2 oppose: AIV, GF

(10) Citizen Suit Enforcement (VLS, VPIRG, VNRC)
14 full support: PPNNE, VCV, VLS, VDH, LCI, ANR, VPRIG, VNRC, UVM, 7th Gen., DOL, TAC, DPS, Balcom
2 oppose: AIV, GF

(11) Medical Monitoring (VLS, VPIRG, VNRC)
12 full support: DOL, VCV, ANR, PPNNE, TAC, VPIRG, VNRC, LCI, UVM, DPS, VLS, Balcom
2 oppose: AIV, GF

(12) Strict Joint and Several Liability with a Right to Seek Contribution (VLS, VPIRG, VNRC)
11 full support: VCV, PPNNE, DPS, VLS, VPIRG, VNRC, LCI, Balcom, UVM, 7th Gen., TAC
2 oppose: AIV, GF

(13) Testing of private water for manmade chemicals (Department of Health)
15 full support: DOL, VPIRG, PPNNE, VNRC, ANR, TAC, UVM, LCI, VLS, Balcom, VCV, AAFM, DPS, VDH, GF.
No opposition.

10. All proposals were selected as majority recommendations based on a minimum 11 member full support.

11. Jen Duggan outlined next steps and deadlines. Working group members should submit comments on majority recommendations no later than December 2. ANR will share a draft report with the Working Group by December 15. Mitch Krauss and Jon Groveman will be added to the report drafting subcommittee, which was convened earlier in the year.

12. The meeting ended at approximately 4:30.

Working group members in attendance:

Ian Balcom¸ *Lyndon State College (Balcom)*
Paul Burns, *Vermont Public Interest Research Group (VPIRG)*
Josh Cox, Vermont *Department of Emergency Management and Homeland Security (Department of Public Service (DPS)*
Bill Driscoll, *Associated Industries of Vermont (AIV)*
Jen Duggan, *Agency of Natural Resources (ANR)*
James Ehlers, *Lake Champlain International (LCI)*
Cary Giguere, *Vermont Agency of Agriculture (AAFM)*
Jon Groveman, *Vermont Natural Resources Council (VNRC)*
Lauren Heirl, *Vermont Conservation Voters (VCV)*
Deborah Hirtz, *University of Vermont Medical Center (UVM)*
Thom Jagielski, *Global Foundries (GF)*
Shaina Kasper, *Toxics Action Center (TAC)*
Mitch Krauss, *Burton Snowboards (Burton)*
Scott Meyer, *Vermont OSHA (Department of Labor – DOL)*
Aaron Page, *Cabot Creamery (Agri-Mark)*
Ken Rumelt, *Vermont Law School (VLS)*
Sarah Vose, *Vermont Department of Health (VDH)*
Martin Wolf, *Seventh Generation (7th Gen)*

Interested parties in attendance:
Linda Boccuzzo, *Vermont Agency of Agriculture Food & Markets*
David Englander, *Vermont Department of Health*
Morgan Fray, *Vermont Law School*
Rinku Kapoor, *Vermont Law School*
Matt McMann, *MMR*
Meagan Noonan, *VPRIG*
Nicole Sala, *Seventh Generation*
Falko Schilling, *VPIRG*
Nat Shambaugh, *Lake Champlain Basin Program*
Jack Spicer, *Vermont Law School*
Daniel Tukey, *Global Foundries*

Agency of Natural Resources staff in attendance:
Marjorie Gale
Joanne Garton
Jordan Gonda
Ernie Kelly
Lynn Metcalf
Chuck Schwer
John Zaikowski

APPENDIX H

Comments on Majority Recommendations of the
Act 154 Chemical Use Working Group

Comments on Policy Proposal Recommendations
Act 154 Chemical Use Working Group

Submitted by: **Associated Industries of Vermont**
GLOBALFOUNDRIES
Mack Molding

General Comments

Manufacturers, retailers, and other affected businesses would in principle support legislative proposals that address legitimate gaps in efforts to protect public health and safety. However, to be a responsible recommendation, a proposal needs to meet several criteria. These include avoiding duplication or redundancy or conflict relative to existing state or federal laws and regulations, addressing a legitimate threat to public health and safety, effectiveness, affordability both in absolute terms and relative to the benefits being pursued, practicality in terms of technical and other administrative expertise and resources, and appropriateness for state responsibility – as opposed to federal, industry, or other more appropriate responsibility.

In general, the recommendations approved by the majority of the Working Group do not meet key criteria, although often owing in large part to insufficient information, analysis, or specifics at this time. This stems in part from relatively little time available for meaningful evaluation and discussion of the numerous items the Working Group was charged to consider. It is possible that more time could have allowed greater cost/benefit analysis and wider stakeholder involvement to identify and refine supportable recommendations.

Nevertheless, there are several subjects and some initial steps forward worth pursuing further, particularly in Recommendation 1, and we would look forward to participating in ongoing efforts to identify and develop responsible legislative or administrative initiatives.

Comments on Specific Recommendations

Recommendation 1: Interagency Committee; Expanded Reporting; Chemical Database

There would be significant benefits to reforming and streamlining chemical reporting to lower compliance costs and burdens for manufacturers and other businesses, improve the pooling or sharing of information across state agencies, and facilitate access to information currently available to the public.

We support continued work toward these goals, including interagency coordination with direct engagement with manufacturers, retailers, and other businesses subject to relevant requirements or proposed new requirements. We would note that the recommendation should explicitly include the Agency of Commerce and Community Development as well as manufacturers and retailers among stakeholders to be engaged.

The Working Group, however, has not established the foundation necessary to recommend responsibly that the number of chemicals subject to reporting requirements should be expanded, particularly not to the point of all chemicals regardless of toxicity, volume, use, etc. Unless compliance costs and administrative burdens are addressed, it could be prohibitively expensive and burdensome to expand reporting requirements to new chemicals without a corresponding threat to health and safety.

It should also be noted that there are already mechanisms and authorities to expand existing reporting requirements if actually warranted, and a significant amount of information already being reported but not necessarily being utilized as effectively as might be possible. Issues that should be addressed before considering sweeping expansions include the above noted changes to reporting regimes to ensure that reporting requirements are affordable and reasonable, that reported information is being used effectively, and that there are sufficient health and safety concerns or risks to warrant reporting on given new chemicals.

With regard to chemical reporting made available to the public, there should be further consideration of ways to provide greater education about what information means and does not mean with regard to health and safety risks. There is potential for misunderstanding or misrepresenting information currently available to the public, such as misperceived risk attributed to the mere presence of a chemical without regard to how safely it is being used and managed.

With regard to expanding information available to the public beyond current law, the Working Group has not addressed questions of utility of information, issues of understanding and potential misrepresentation, confidential business information, and related matters that need to be addressed before recommendations for expanding public information can be made responsibly. These are questions that should be considered further by the agencies and other stakeholders noted above.

In sum, therefore, there are several aspects of Recommendation 1 worth pursuing while others would benefit from further consideration or resolving intermediate issues and questions first.

Recommendation 2: Funding for Interagency Committee

Interagency coordination and engagement of stakeholders can and should be accomplished with existing staff. There was no evidence or substantive demonstration provided to the Working Group to establish otherwise. The cost of hiring new staff specifically to work on these matters is not warranted in the context of state budget constraints and existing fee burdens on manufacturers.

Recommendation 3: Act 100 Certified Planner Requirement

Requiring that certified planners sign off on all plans submitted under Act 100 would increase compliance costs. There was no evidence or substantive demonstration provided to the Working Group to establish that the current system is leading to harm that needs to be and would in fact be addressed through such a new requirement. Until such a need can be substantively demonstrated and the potential costs can be estimated and weighed against benefits, a foundation to make this recommendation does not exist.

Increased state compliance and related technical assistance has great potential value; however, greater specificity as to what assistance would be provided, as well as the cost and funding for such assistance, would need to be provided and assessed before the Working Group could responsibly include this in its formal recommendations. This could be further considered by agencies and manufacturers and other stakeholders in the course of reforming existing reporting requirements as discussed in the comments on Recommendation 1.

Recommendation 4: Act 100 Expand List of Substances

Reporting requirements under Act 100 can be costly and administratively burdensome. There was no evidence or substantive demonstration provided to the Working Group to inform a cost benefit consideration of this recommendation on its own merits or relative to alternative approaches to expanded reporting requirements. Rather than simply expanding chemicals and lowering thresholds for reporting under Act 100 without considering costs and burdens or concerns with specific chemicals, we would recommend the approach outlined in our comments on Recommendation 1.

Recommendation 5: Ban PFASs Food Contact Substances/Dental Floss

The Working Group did not discuss the merits of this recommendation. It did not engage stakeholders with expertise and interests in the issue. It did not assess the sufficiency of or warranted deference to federal regulatory entities and regimes. In sum, the Working Group did not do due diligence to support this recommendation at this time.

Recommendation 6: Make it Easier to Restrict/Label Chemicals of High Concern in Children's Products

The existing statutes addressed by this recommendation were specifically designed to help ensure that the regulatory decisions in question are made with the breadth of expertise and perspectives necessary for balance and competence, and that decisions are informed by sufficient scientific evidence. This recommendation seeks to enable regulatory changes that are less informed and less scientifically justified than was intended when Act 188 was enacted. These are critical failings of this recommendation.

Recommendation 7: Expand Act 188 to Cover All Consumer Products

Act 188 already has a regular reporting requirement on whether to expand its coverage to additional products; this is a question that is already addressed in existing law. Expanding Act 188 raises a number of questions of costs and benefits that were not discussed by the Working Group. The Working Group did not discuss or establish grounds for overruling the existing mechanism for recommending any expansion.

Recommendation 8: Provide Greater Information on Chemicals and Hazardous Materials

As noted in the comments provided on Recommendation 1 above, there are a number of questions that should be further considered and addressed regarding information currently available to the public and any possible expansion of such information. As noted previously, there is potential for misunderstanding or misrepresenting information currently available to the public, such as misperceived risk because of the mere presence of a chemical without regard to how safely it is being used and managed.

Rather than making this specific recommendation, therefore, we would support the approach on this matter outlined in our comments on Recommendation 1.

Recommendation 9: Improve Citizen Right to Know, Assess, and Address Risks of Contamination

This recommendation overlaps significantly the areas addressed in Recommendation 1. Rather than making this specific recommendation, we would support the approaches on these matters outlined in our comments on Recommendation 1.

Recommendation 10: Citizen Suit Enforcement

There was no evidence or substantive demonstration provided to the Working Group to establish that the current system is leading to harm that needs to be and would in fact be addressed through citizen suit enforcement. Moreover, citizen suits raise questions of additional cost, arbitrariness and predictability, and professional competence in regulatory enforcement and compliance that were not meaningfully discussed or considered by the Working Group. As such, the Working Group did not establish with due diligence a foundation to make this recommendation.

It should also be noted that if agencies are demonstrated to be failing to properly enforce regulations, it is more appropriate to consider and address issues with those agencies directly.

Recommendation 11: Medical Monitoring

As with other recommendations, this proposal was not the subject of extensive discussion by the Working Group. The written proposal suggests that this recommendation might have few if any precedents in federal or other state law, and to the extent that is the case, the reasons for that have not been presented or considered. It also suggests that this is a matter that has not yet been addressed in the courts, leaving open a question as to whether it is in fact necessary. Given the many questions surrounding this matter, the Working Group has not established a foundation to make this recommendation.

Recommendation 12: Strict Joint and Several Liability

There was no evidence or substantive demonstration provided to the Working Group to establish that the existing civil remedies in state law are as such leading to harm that needs to and would be prevented through the expansion of remedies proposed in this recommendation. Moreover, the proposal raises a number of significant questions about costs and liabilities, including those associated with legal and permitted activities, that were not meaningfully discussed or considered by the Working Group. Given the many questions and clear concerns surrounding this matter, the Working Group has not established a foundation to make this recommendation.

Comments on Proposal Recommendations and Response to Comments by AIV, GF & Mack Molding

Act 154 Chemical Use Working Group

Submitted by: Seventh Generation

General Comments

Seventh Generation supports Recommendation 1 of the Working Group, to (1) create an interagency committee to review chemical inventories and identify potential risks to Vermonters and the environment; (2) streamline and expand existing recordkeeping and reporting requirements to require users, manufacturers, importers, and distributors of chemicals to create and report inventories of all chemicals to the State on an annual basis; (3) create an easy-to-use electronic reporting system and regulatory guidance for businesses; and (4) create a new Natural Resources Atlas data layer with information on the use, manufacture, import, and distribution of chemicals in the State.

In addition, Seventh Generation supports expanded reporting of chemical inventories under the existing Tier II, VOSHA Hazard Communication Standards, Act 188, and any other existing statutory and regulatory requirements, as businesses are already required to inventory and/or report chemicals under these statutes.

Seventh Generation also supports Recommendation 7 to expand Act 188 to Cover All Consumer Products, as these products are not regulated as sources of chemical contaminants in other statutes, Recommendation 10: Citizen Suit Enforcement, so citizens can more easily recover damages when harmed by the release of chemicals, and Recommendation 12: Strict Joint and Several Liability.

Recommendation 1: Interagency Committee; Expanded Reporting; Chemical Database

We agree with the comments by AIV, GF and Mack Molding that manufacturers and retailers are key stakeholders that should be engaged with the interagency committee. We are agnostic on a role for the Agency of Commerce and Community Development.

Contrary to the comments, we continue to fully support the expansion of reporting to all chemicals. Addressing the concern that ANR does not have the foundation to propose that all chemicals be reported, Working Group members have identified a significant gap in knowledge of what chemicals are currently used or have been in used, and of where they were stored and used. This gap is particularly amplified and troublesome when new a chemical toxicity finding warrants a regulatory update. VOSHA has identified the difficulty of following-through with regulatory updates when the State does not know where the chemical is used or has been used. Reporting all chemicals is a proactive way to address this gap in knowledge and easily identify the points of use of chemicals when a chemical has been identified as of concern.

The addition of an online reporting system and database can streamline reporting so the administrative burdens and physical act of reporting decrease over time. As stated by members of the working group, small businesses are sometimes uncertain of what must be reported, which would be resolved with a

user-friendly, online reporting system. Additionally, exempting de minimis levels of chemicals would reduce the reporting burden.

Recommendation 2: Funding for Interagency Committee

We agree that the proposed interagency committee should call upon existing staff where possible. However, hiring a new staff member should not be dismissed if the existing agencies are not able to effectively implement the additional statutory and regulatory responsibilities considered here.

Recommendation 3: Act 100 Certified Planner Requirement

The details of a certified planner requirement should be further discussed, as there was not substantial evidence or discussion of this proposal within the Working Group timeframe. The added compliance burdens should be considered, as well as timing of implementation. If a certified planner requirement is determined to be highly burdensome, it would be best suited for implementation in a future phase or proposal rather than with this Working Group's proposal.

Recommendation 4: Act 100 Expand List of Substances

We agree that reporting should not be expanded under Act 100, but rather expanded under the existing Tier II requirements per Recommendation 1.

Recommendation 5: Ban PFASs Food Contact Substances/Dental Floss

Seventh Generation does not support a ban on PFASs Food Contact Substances/Dental Floss as a distinct recommendation of the Working Group. The banning of substances in specific products is a chemical-by-chemical approach that is inconsistent with the holistic approach being proposed by this committee.

Recommendation 6: Make it Easier to Restrict/Label CoHC in Children's Products

Seventh Generation is agnostic on this Recommendation.

Recommendation 7: Expand Act 188 to Cover All Consumer Products

Seventh Generation supports the recommendation that Act 188 be expanded to include all consumer products. Presently, chemicals of concern in consumer products, other than children's products as defined in Act 188, are not required to be disclosed, nor are their uses well regulated. Expanding Act 188 to Cover all consumer products provides meaningful information that Vermont citizens can use to avoid unnecessary exposure to chemicals of concern.

Recommendation 8: Provide Greater Information on Chemicals and Hazardous Materials

Seventh Generation supports providing greater information on chemicals in the environment and in their homes. Consumers should have a right to know what chemicals are contained in the products they buy, and what chemicals are being used in proximity to their homes and sources of food and drinking water. Certainly, this information should be provided in a way that minimizes misunderstanding. However, no information invariably leads to the greatest misunderstandings.

Currently, information on chemical use is public knowledge. However, the information is not maintained in a reliable, systematic way and is difficult to access. Implementation of an improved database, as envisioned in Recommendation 1, would improve the reliability of data gathering and make the information more readily available.

Recommendation 9: Improve Citizens Right to Know, Access, and Address Risks of Contamination

This recommendation is included in the broader Working Group recommendations and we continue to support improving the citizen right to know. The last part of the original recommendation, requiring testing of private water supplies when property is transferred, should be revised to require such testing only when an identified chemical exposure risk is present. Requiring testing at all property transfers creates an unnecessary burden on the state or property owners.

Recommendation 10: Citizen Suit Enforcement

State agencies have a limited amount of time and resources, which often creates a gap in enforcement. We support the proposal for a Citizen Suit to responsibly address this enforcement gap so that citizens can protect their health by enforcing the law.

Recommendation 11: Medical Monitoring

A chemical exposure can be challenging to prove when external exposures in our surroundings and consumption play an additive role. We support the recommendation for medical monitoring in cases where there is a known and clear risk of exposure to a population or individual.

Recommendation 12: Strict Joint and Several Liability

We support the proposal for strict joint and several liability to ensure that those responsible for releases can be held accountable.

Response to comments on ACT 154 working group on toxic chemicals recommendations submitted by Associated Industries of Vermont, Global Foundries, Mack Molding

Submitted by: Dr. Ian Balcom

General Comments:

The comments provided by Associated Industries of Vermont (AIV), Global Foundries (GF), Mack Molding (MM) (hereafter referred to as AIV/GF/MM), while effectively communicate the concerns of a few potentially affected parties, do not reflect the charge of the Working Group as outlined in ACT 154. The comments provided express concerns that stem from a default position of maintaining status quo by these three groups, not substantive comments on the recommendations themselves. I invite authors of the AIV/GF/MM comments to review the language in ACT 154 (below) that outlines the purpose of the Working Group and encourage them to comment specifically on the recommendations with a shared goal of improving the transparency, accesses to information, and to increase our ability to prevent human health and environmental damage as these relate to the use of chemicals in the State of Vermont. However, as expressed, it appears that the authors of the AIV/GF/MM comments are voicing opposition to *any change* in chemical policies in Vermont rather than seeking to improve chemical regulation. While I can appreciate the budgetary impacts that could potentially be instigated by changes to chemical regulation here in Vermont, these impacts are insignificant relative to the costs of retroactively remediating environmental and human health costs resulting from exposure to toxic chemicals. Nearly all of the comments provided by AIV, GF, and MM focus on the absence of a cost-benefit analysis accompanying each recommendation provided by the Working Group. While this is clearly an important step to be completed by the legislature at a later date, the Working Group was specifically instructed not to consider cost during this phase of deliberations.

Specific responses to AIV/GF/MM comments:

1. **AIV/GF/MM:** "Manufacturers, retailers, and other affected businesses would in principle support legislative proposals that address legitimate gaps in efforts to protect public health and safety. However, to be a responsible recommendation, a proposal needs to meet several criteria. These include avoiding duplication or redundancy or conflict relative to existing state or

> federal laws and regulations, addressing a legitimate threat to public health and safety, effectiveness, affordability both in absolute terms and relative to the benefits being pursued, practicality in terms of technical and other administrative expertise and resources, and appropriateness for state responsibility – as opposed to federal, industry, or other more appropriate responsibility."

As mentioned above, the charge of the working group as promulgated in ACT 154 specifically outlines several goals:

> "(1) Identify the existing State or federal programs that establish reporting or management requirements regarding the use or generation of a toxic substance, hazardous waste, or hazardous material. The Working Group shall identify how those programs identify the toxic substance, hazardous waste, or hazardous material for regulation and briefly describe the management of the waste or substance."

And

> "2) Evaluate the State or federal programs identified in subdivision (1) of this subsection to determine:
>
> (A) the program's effectiveness in preventing releases of toxic substances, hazardous wastes, or hazardous materials;
>
> (B) whether gaps or duplication exists between the programs that should be addressed to reduce threats to human health and the environment; and
>
> (C) whether the programs are adequately funded and staffed to meet their statutory and regulatory purpose.
>
> (3) Identify State or federal programs that require a response to the release of a toxic substance, hazardous waste, or hazardous material and assess their effectiveness in responding to releases in a manner that minimizes impacts to human health and the environment.
>
> (4) Identify programs in place in other states that address the threat to human health and the environment from emerging contaminants and assess their effectiveness in accomplishing those objectives.

(5) Evaluate the State of Vermont's existing sources of publicly available information about toxic chemicals, including emerging contaminants, hazardous waste, and hazardous materials in Vermont.

(6) Evaluate whether civil remedies under Vermont law are sufficient to ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused.

(7) Evaluate the obligations on the Environmental Contingency Fund established under 10 V.S.A. § 1283 and funding alternatives that would ensure the long-term solvency of the Fund.

(c) The Working Group shall submit a report to the Senate and House Committees on Natural Resources and Energy and to the House Committee on Fish, Wildlife and Water Resources with its findings and recommendations on or before January 15, 2017."

It is clear from this list of goals, that "avoiding duplication or redundancy or conflict relative to existing state of federal laws and regulations" was not considered pertinent to the working group's deliberations at this time by the legislature.

2. **AIV/GF/MM: "**It is possible that more time could have allowed greater cost/benefit analysis and wider stakeholder involvement to identify and refine supportable recommendations."

The working group was not asked to consider cost/benefit analysis of the recommendations. Furthermore, given the time allotted for this work, it is unrealistic to suggest that a thorough cost/benefit analysis of the recommendations could be completed. Additionally, while it is important to consider of cost any policy recommendations, AIV/GF/MM are excluding the cost of exposure to unregulated toxic chemicals in their comments. There is mounting evidence to suggest the cost of exposure to unregulated toxic substances are significant (Attina, Hauser et al. 2016) and should be specifically highlighted in any cost-benefit analysis.

3. **AIV/GF/MM:** "The Working Group, however, has not established the foundation necessary to recommend responsibly that the number of chemicals subject to reporting requirements should be expanded, particularly not to the

point of all chemicals regardless of toxicity, volume, use, etc. Unless compliance costs and administrative burdens are addressed, it could be prohibitively expensive and burdensome to expand reporting requirements to new chemicals without a corresponding threat to health and safety."

Act 154 specifically charges the working group to consider "emerging contaminants":

> "(4) Identify programs in place in other states that address the threat to human health and the environment from emerging contaminants and assess their effectiveness in accomplishing those objectives."

Given that the toxicities of emerging contaminants are, by definition, not known, the comment provided by AIV/GF/MM is not pertinent to the recommendations.

4. **AIV/GF/MM: "**With regard to chemical reporting made available to the public, there should be further consideration of ways to provide greater education about what information means and does not mean with regard to health and safety risks. There is potential for misunderstanding or misrepresenting information currently available to the public, such as misperceived risk attributed to the mere presence of a chemical without regard to how safely it is being used and managed."

Goal 3 of the Working Group as outlined in ACT 154 is

> "(3) inform communities and citizens in the State of potential exposure to toxic chemicals, including contamination of groundwater, public drinking water systems, and private potable water supplies."

There is no specific mention charge to identify opportunities to educate communities and citizens about the health risks resulting from chemical exposures. Again, the comment provided by AIV/GF/MM is not relevant to the Working Group's recommendations.

5. **AIV/GF/MM:** "Interagency coordination and engagement of stakeholders can and should be accomplished with existing staff. There was no evidence or substantive demonstration provided to the Working Group to establish otherwise. The cost of hiring new staff specifically to work on these matters is not warranted in the context of state budget constraints and existing fee

burdens on manufacturers."

Once again, AIV/GF/MM comments do not reflect the goals of the Working Group as outlined in ACT 154. Specifically:

> "(2) Evaluate the State or federal programs identified in subdivision (1) of this subsection to determine:
>
> (C) whether the programs are adequately funded and staffed to meet their statutory and regulatory purpose."

To ask current staff, with obligations often exceeding FTE workloads, to initiate and complete significantly more work of a complex nature is unrealistic. To suggest that any meaningful change would result from the formation of an interagency committee comprised entirely of existing staff is a mischaracterization of the staffing levels of the relevant agencies. Furthermore, with one toxicologist staff member in the State of Vermont, the availability of the necessary expertise to complete this work is severely challenged by current obligations.

6. **AIV/GF/MM:** "There was no evidence or substantive demonstration provided to the Working Group to establish that the current system is leading to harm that needs to be and would in fact be addressed through such a new requirement. Until such a need can be substantively demonstrated and the potential costs can be estimated and weighed against benefits, a foundation to make this recommendation does not exist."

On the contrary, there is clear evidence "that establishes that the current system is leading to harm that needs to be …. addressed". I invite the authors of these comments to review the contaminated drinking water issues unfolding in North Bennington (http://www.nytimes.com/2016/03/15/nyregion/vermont-town-is-latest-to-face-pfoa-tainted-water-scare.html?_r=0, http://www.rutlandherald.com/article/20160721/THISJUSTIN/160729920, https://theintercept.com/2016/05/19/with-new-pfoa-drinking-water-advisory-dozens-of-communities-suddenly-have-dangerous-water/, http://digital.vpr.net/post/bennington-county-blood-test-results-show-high-levels-pfoa#stream/0)

7. **AIV/GF/MM:** "Reporting requirements under Act 100 can be costly and administratively burdensome. There was no evidence or substantive demonstration provided to the Working Group to inform a cost benefit consideration of this recommendation on its own merits or relative to alternative approaches to expanded reporting requirements. Rather than simply expanding chemicals and lowering thresholds for reporting under Act 100 without considering costs and burdens or concerns with specific chemicals, we would recommend the approach outlined in our comments on Recommendation 1."

Once again, cost was not a Working Group consideration specified in ACT 154. This comment arbitrarily adds cost as one of the Working Group's areas of consideration. Furthermore, in order to capture information on emerging contaminants, whose toxicities are not known, increased reporting compliance is necessary.

8. **AIV/GF/MM:** "…there is potential for misunderstanding or misrepresenting information currently available to the public, such as misperceived risk because of the mere presence of a chemical without regard to how safely it is being used and managed."

While this comment accurately describes on potential risk associated with increased transparency, it is again arbitrarily adding an area of consideration to the goals of the Working Group. Act 154 states:

> "Secretary of Resources shall establish a working group of interested parties and parties with expertise in the field of toxic chemical use and regulation to develop recommendations for how to improve the ability of the State to:
>
> (3) inform communities and citizens in the State of potential exposure to toxic chemicals, including contamination of groundwater, public drinking water systems, and private potable water supplies."

The perception (or misperception) of risk is an important area for future consideration, however the EPA Toxics Release Inventory program clearly establishes precedence that increase reporting and transparency drive significant reductions in exposure to toxic chemicals (https://www.epa.gov/toxics-release-inventory-tri-program/30th-anniversary-

toxics-release-inventory-tri-program).

Excerpted from ACT 154 for your reference:

* * * Working Group on Toxic Chemicals * * *

Sec. 10. AGENCY OF NATURAL RESOURCES' WORKING GROUP ON

TOXIC CHEMICAL USE IN THE STATE

(a) Formation. On or before July 1, 2016, the Secretary of Natural

Resources shall establish a working group of interested parties and parties with expertise in the field of toxic chemical use and regulation to develop recommendations for how to improve the ability of the State to:

(1) prevent citizens and communities in the State from being exposed to toxic chemicals, hazardous materials, or hazardous wastes;

(2) identify and regulate the use of toxic chemicals or hazardous materials that currently are unregulated by the State; and

(3) inform communities and citizens in the State of potential exposure to toxic chemicals, including contamination of groundwater, public drinking water systems, and private potable water supplies.

(b) Duties. The Working Group shall: (1) Identify the existing State or federal programs that establish

reporting or management requirements regarding the use or generation of a toxic substance, hazardous waste, or hazardous material. The Working Group shall identify how those programs identify the toxic substance, hazardous waste, or hazardous material for regulation and briefly describe the management of the waste or substance.

(2) Evaluate the State or federal programs identified in subdivision (1) of this subsection to determine:

(A) the program's effectiveness in preventing releases of toxic substances, hazardous wastes, or hazardous materials;

(B) whether gaps or duplication exists between the programs that should be addressed to reduce threats to human health and the environment; and

(C) whether the programs are adequately funded and staffed to meet their statutory and regulatory purpose.

(3) Identify State or federal programs that require a response to the release of a toxic substance, hazardous waste, or hazardous material and assess their effectiveness in responding to releases in a manner that minimizes impacts to human health and the environment.

(4) Identify programs in place in other states that address the threat to human health and the environment from emerging contaminants and assess their effectiveness in accomplishing those objectives.

(5) Evaluate the State of Vermont's existing sources of publicly available information about toxic chemicals, including emerging contaminants, hazardous waste, and hazardous materials in Vermont.

(6) Evaluate whether civil remedies under Vermont law are sufficient to ensure that private individuals are adequately protected from releases of hazardous materials, hazardous wastes, and toxic chemicals and that persons responsible for such releases pay for any harm caused.

(7) Evaluate the obligations on the Environmental Contingency Fund established under 10 V.S.A. § 1283 and funding alternatives that would ensure the long-term solvency of the Fund.

(c) The Working Group shall submit a report to the Senate and House Committees on Natural Resources and Energy and to the House Committee on Fish, Wildlife and Water Resources with its findings and recommendations on or before January 15, 2017.

Citation:

Attina, T. M., et al. (2016). "Exposure to endocrine-disrupting chemicals in the USA: a population-based disease burden and cost analysis." Lancet Diabetes Endocrinol **4**(12): 996-1003.

BACKGROUND: Endocrine-disrupting chemicals (EDCs) contribute to disease and dysfunction and incur high associated costs (>1% of the gross domestic product [GDP] in the European Union). Exposure to EDCs varies widely between the USA and Europe because of differences in regulations and, therefore, we aimed to quantify disease burdens and related economic costs to allow comparison. METHODS: We used existing models for assessing epidemiological and toxicological studies to reach consensus on probabilities of causation for 15 exposure-response relations between substances and disorders. We used Monte Carlo methods to produce realistic probability ranges for costs across the exposure-response relation, taking into account uncertainties. Estimates were made based on population and costs in the USA in 2010. Costs for the European Union were converted to US$ (euro1=$1.33). FINDINGS: The disease costs of EDCs were much higher in the USA than in Europe ($340 billion [2.33% of GDP] vs $217 billion [1.28%]). The difference was driven mainly by intelligence quotient (IQ) points loss and intellectual disability due to polybrominated diphenyl ethers (11 million IQ points lost and 43 000 cases costing $266 billion in the USA vs 873 000 IQ points lost and 3290 cases costing $12.6 billion in the European Union). Accounting for probability of causation, in the European Union, organophosphate pesticides were the largest contributor to costs associated with EDC exposure ($121 billion), whereas in the USA costs due to pesticides were much lower ($42 billion). INTERPRETATION: EDC exposure in the USA contributes to disease and dysfunction, with annual costs taking up more than 2% of the GDP. Differences from the European Union suggest the need for improved screening for chemical disruption to endocrine systems and proactive prevention. FUNDING: Endocrine Society, Ralph S French Charitable Foundation, and Broad Reach Foundation.

MEMORANDUM

TO: Jen Duggan
ANR General Counsel

FROM: VNRC, VPIRG, VCC, LCI and VLS ENRLC

RE: AIV, Global Foundries and Mack Molding Comments on Act 154 Workgroup Majority Recommendations

DATE: December 14, 2016

The following is the Vermont Natural Resources Council (VNRC), the Vermont Public Interest Research Group (VPIRG), Vermont Conservation Voters (VCV), Lake Champlain International (LCI), and the Vermont Law School Environmental and Natural Resources Law Clinic (VLS ENRLC) response to Associated Industries of Vermont's (AIV), Global Foundries' and Mack Molding's (Commenters) comments on the Act 154 Report Majority Recommendations:

The Commenters provide no support for their assertion that the majority recommendations do not qualify as "responsible recommendations." The Commenters have defined "responsible recommendations" on their own. The Act 154 Workgroup (Workgroup) did not discuss this term, nor did the group discuss or agree to the criteria that the Commenters have developed to determine what they believe qualifies as a "responsible recommendation."

That is not to say that the Workgroup did not consider whether the majority proposals were necessary to protect Vermonters from the use and storage of toxic chemicals in communities throughout the state. To the contrary, the Workgroup spent several meetings identifying and discussing gaps in the laws meant to protect Vermonters from the dangers posed by toxic chemicals. We benefitted greatly from the painstaking research in this area completed by agency staff, as well as the presentations made by outside experts. We later considered how each proposal addressed a gap that was identified.

The proposals endorsed in the report were deemed by a majority of members of the Workgroup to address a clear gap in protections afforded Vermonters from exposure to toxic chemicals. The majority recommendations were endorsed by State agencies, businesses that use toxic chemicals, academic leaders, and public interest organizations.

The Commenters criticisms of the specific majority recommendations supported by the Workgroup fall into three main categories: the proposals are not necessary to protect Vermonters, the proposals are too costly, or the proposals were not adequately discussed. As already noted, the Workgroup spent the bulk of our time

identifying gaps in our laws and developing proposals to address these gaps, completing the task that the Workgroup was charged with under Act 154. The proposals were submitted in writing for consideration by the entire group and debated. We believe that the report when completed will clearly identify the rationale and research that supports each proposal.

From: Duggan, Jen
To: Duggan, Jen
Subject: Act 154 Chemical Working Group: Comments on Majority Policy Recommendations
Date: Thursday, December 15, 2016 8:31:48 AM

-----Original Message-----
From: natsh@myfairpoint.net [mailto:natsh@myfairpoint.net]
Sent: Wednesday, December 14, 2016 7:42 AM
To: Garton, Joanne <Joanne.Garton@vermont.gov>; acdemag@vtlobbyists.com; ahoogenboom@cabotcheese.com; Anne.burmeister@ppnne.org; apage@cabotcheese.com; Boccuzzo, Linda <Linda.Boccuzzo@vermont.gov>; Chapman, Matt <Matt.Chapman@vermont.gov>; Cox, Josh <Josh.Cox@vermont.gov>; Daniel Tukey <Daniel.Tukey@globalfoundries.com>; Deborah.Hirtz@uvmhealth.org; Erin Sigrist <erin@vtrga.org>; FALKO@vpirg.org; Gale, Marjorie <Marjorie.Gale@vermont.gov>; Giguere, Cary <Cary.Giguere@vermont.gov>; Gonda, Jordan <Jordan.Gonda@vermont.gov>; ian.balcom@lyndonstate.edu; Jack Spicer <JackSpicer@vermontlaw.edu>; james@champlain.ngo; jchoquette@drm.com; jgroveman@vnrc.org; Jonas Reagan <JonasReagan@vermontlaw.edu>; kati@vpirg.org; Kelley, Ernie <Ernie.Kelley@vermont.gov>; KRUMELT@vermontlaw.edu; Lafrance, Tracy <Tracy.LaFrance@vermont.gov>; lauren@vermontconservationvoters.org; Lizzie Tisher <LizzieTisher@vermontlaw.edu>; Marc.Colety@Mack.com; matt@mmrvt.com; megan@vpirg.org; Metcalf, Lynn <Lynn.Metcalf@vermont.gov>; Meyer, Scott <Scott.Meyer@vermont.gov>; mhw@seventhgeneration.com; mikeschade@saferchemicals.org; mitchk@burton.com; Morgan Fray <MorganFray@vermontlaw.edu>; nick@ksepartners.com; pburns@vpirg.org; Rinku Kapoor <RinkuKapoor@vermontlaw.edu>; Ruma.Kohli@globalfoundries.com; Schwer, Chuck <Chuck.Schwer@vermont.gov>; shaina@toxicsaction.org; Thomas.Jagielski@globalfoundries.com; Vose, Sarah <Sarah.Vose@vermont.gov>; Warren Coleman <warren@mmrvt.com>; wdriscoll@aivt.org; whitaker.stephen@gmail.com; Wuestenberg, Tami <Tami.Wuestenberg@vermont.gov>; Kathleen Masterson <kmasterson@vpr.net>; Zaikowski, John <John.Zaikowski@vermont.gov>; Kenney, Justin <Justin.Kenney@vermont.gov>; Duggan, Jen <Jen.Duggan@vermont.gov>
Subject: RE: Act 154 Chemical Working Group: Comments on Majority PolicyRecommendations

Hello all,
I would like to make two brief comments on the majority recommendations:
1) The Vermont ANR proposal for an interagency committee should be expanded to include several members from outside state government. Industry, Academia, and Environmental interests/expertise should be included. State government is not the only source of toxic chemical expertise in Vermont, so this comittee should be more inclusive.
2) As written, The Vermont Agency of agriculture proposal to track consumer sales of pesticides will not accomplish the stated goal of improving knowledge of pesticide use across the state with sufficient detail to include in the Natural Resource Atlas. Some mechanism to determine at least what town or county the product is actually used in is necessary for this information to be useful to the Agency and the public.
Thank you for listening,
Nat Shambaugh
Berlin, VT

From: Duggan, Jen
To: Duggan, Jen
Subject: FW: Act 154 Chemical Working Group: Comments on Majority Policy Recommendations
Date: Thursday, December 15, 2016 9:10:38 AM

From: Stephen Whitaker [mailto:whitaker.stephen@gmail.com]
Sent: Thursday, December 08, 2016 5:13 PM
To: Duggan, Jen <Jen.Duggan@vermont.gov>
Cc: Martin, Trey <Trey.Martin@vermont.gov>
Subject: RE: Act 154 Chemical Working Group: Comments on Majority Policy Recommendations

RE: AIV, Global Foundries, Mack Moulding comments

At 02:07 PM 12/8/2016, David Hassel wrote:

Hi,

What little expertise I have is in science, not politics, but I?ll give this a shot trying to use reason:

This is discouraging, but nothing new. The same tactics used here have often been used against EPA, sometimes successfully. While in theory, some of the objections might have some merit, as a practical matter the objections are seldom if ever justified when reviewing the actual rules and regulations issued by responsible and knowledgeable parties.

In essence, what they try to do here is use lawyers to tie up and prevent any possibility of regulatory or even information dissemination actions by insisting on reams and reams of paperwork, and requiring concrete legal ?proof? of toxicity and ?proof? of no cost to business before enacting any regulation, while at the same time insisting that industry be allowed to do anything that they want to with no research into health effects or knowledge whatsoever of what they are doing.

One could use this same argument to allow corporate managers to drive 120mph on city streets because there is no ?research? and no ?proof? that every time someone does this someone else will die. By their kind of reasoning ?proof? would be considered to be 100 fatalities, but would only apply to the street where the deaths occurred, so other streets still could not have speed limits.

I would advise that the committee just ignore these types of comments as having no basis in reason or fact and move on to do their work. Try to apply the objections they make about setting limits on use of toxic chemicals to the setting of 35 mph speed limits on city streets and you will see the real goal is just to prevent regulation, not to assist in making regulations proper and effective and balanced. They have a right to be heard, but no right to prevail.

Dave