2008 Governor's Awards for Environmental Excellence & Pollution Prevention
Description of Award Winning Projects

Environmental Excellence in Pollution Prevention – The first category of awards is Environmental Excellence in Pollution Prevention. Award recipients in this category implemented projects that reduced or eliminated the generation of pollutants and wastes at the source – before it was ever generated. This year we honor one award recipient.

IBM – Wets Engineering Team

With this our 16th annual Governor's Awards ceremony, IBM retains the distinction of being the only company to receive a Governor's Award for Environmental Excellence each year since the awards program inception in 1993. This year we recognize the work done by the Wets Engineering Team.

The IBM Essex semiconductor facility designs and produces logic, microprocessor, and memory computer microchips used by electronics and computer companies worldwide. IBM has completed the replacement of a persistent, bioaccumulating toxic compound called PerFluoro Octyl Sulfonate, used a surfactant in wet chemistry operations. One of every three operations in the semiconductor manufacturing process is a wet chemistry process used to remove particles, etch films, and prepare the silicon wafer surface for other operations. Buffered oxide etchants containing surfactants are used to wet the surface of the substrate being etched. In total, 88 different etching operations across over 100 different products had to be reviewed and qualified in order to make the elimination of the chemical possible.

Five different potential replacement chemicals were evaluated before a replacement chemical deemed safe to the environment was selected. The buffered oxide etchant chemicals containing surfactant are used by the IBM Essex facility for several hundred unique product and operational combinations, greatly increasing the complexity of qualifying a replacement surfactant. The IBM product qualification process using the new chemical began in 2005 and was completed three years later. In total, IBM reduced the use of Perfluoro octyl sulfonates by 83%. The chemical replacement has yielded some side benefits such as higher semiconductor product yield is some situations, showing that pollution prevention pays. The IBM Essex facility's commitment to leadership in waste minimization and pollution prevention is once again exemplified through this project.

Environmental Excellence in Environmental Stewardship and Resource Protection - The next category of awards is for Environmental Excellence in Environmental Stewardship and Resource Protection. Award Recipients in this category implemented projects with measureable and direct benefits to air, land or water – or fish, wildlife, and human communities dependent upon a clean and healthy environment. This year we honor two award recipients.

Green Up Vermont

Vermont's Green Up Day is the only one of its kind in our country: a grassroots effort by thousands of dedicated volunteers. Governor Deane C. Davis organized and strongly backed the

first Green Up Day, held on April 17, 1970. There were about 75,000 volunteers on that day, and every mile of interstate was closed to traffic so that litter could be collected.

Since then -- nearly 40 years -- Green Up Day has been bringing people together on a spring day to clean up their communities roadsides and waterways. The task of organizing thousands – now well over 15, 000 statewide – of community volunteers is no small feat, and Green Up Vermont, a small not-for-profit organization, manages to do it with aplomb. They recruit over 300 town coordinators, conduct a high profile media campaign, and supply and distribute those bright green trash bags. Vermont Green Up raises fund to cover all program costs, with funding from the private sector, the state, and town. At a recent Adopt-A-Highway conference, a vendor of safety equipment was so inspired by President Melinda Vieux's presentation, that he donated 2300 safety vests, which were then given out to towns all over the state.

Green Up Vermont's school education program includes a K-4 curriculum "The Green Up Way Every Day," and an activity booklet as well as a drawing booklet. Nearly everyone is familiar with Vermont Green Up's annual poster contest involving students from grades K-12.

According to Green Up Vermont, there is a trend for more and more businesses to involve their employees in Green Up clean up activities, often during the week prior to Green Up Day.

Although the exact volume of the trash that has been collected on Green Up Day isn't known, it can be said with certainty that it is well into hundreds of tons, and Vermont's cleaner roadsides reflect these efforts.

IBM – Wastewater Engineering Team

The IBM Essex semiconductor facility processes approximately 3.2 million gallons per day of industrial and sanitary wastewater through its on-site wastewater treatment facility which discharges to the Winooski River. IBM's wastewater engineering team routinely investigates optimization of the overall wastewater treatment process to ensure high quality effluent. The treatment facility consists of three primary process trains: metal precipitation and neutralization; biological treatment of sanitary and organic wastes; and chemical/mechanical polish treatment.

The wastewater engineering team was able to achieve three significant process changes that have resulted in effluent quality improvement.

After extensive studies, IBM qualified a new treatment polymer that is added as part of the treatment process to precipitate out metals and other organic contaminants as solids that are then settled out in a series of clarifier tanks.

Secondly, IBM was able to optimize the operation of its solids clarifier to improve solids removal from the wastewater.

Thirdly, the engineering team was able to remove dilute hydrofluoric acid discharges to the plant and converting them to another system for better fluoride removal.

As a result of these modifications, the following discharge reductions have occurred: 49% reduction in phosphorus (2265 lbs annually); 45% reduction in total suspended solids (10,857 lbs annually); 14% reduction in iron (162 lbs annually); and 35% reduction in fluoride (34,600 lbs annually). Phosphorus reduction is important to the health of Lake Champlain.

These modifications have also resulted in annual cost savings of $150,000 due to reduced use of treatment chemicals and idling of one of three solids clarifiers which saves energy, on the order of 625,000 KWH per year.

Environmental Excellence in Education and Outreach – The next award category is for Environmental Excellence in Education and Outreach. Award recipients in this category worked creatively to inform and educate Vermonters about environmentally responsible practices or empowered citizens to enhance the quality of the environment for local, regional, or global communities. This year we honor two award recipients.

Association of Vermont Recyclers

The Association of Vermont Recyclers (AVR) is a non-profit, membership based organization specializing in waste prevention and reduction education and outreach in Vermont. Founded in 1982, AVR is based in Montpelier and provides services on behalf of Solid Waste Districts and Alliances, businesses, and philanthropists in schools, businesses, and communities in all regions of the state.

AVR's Youth Environmental Coalition cultivates environmental stewardship across Vermont by encouraging teens to practice personal responsibility through active engagements in environmental protection projects and a statewide youth network. This program is a network of environmental groups and recycling clubs that focus their efforts on recycling, composting and waste prevention. This network facilitates the exchange of ideas, knowledge and experience between young people throughout the state, and provides their schools and communities with environmentally beneficial projects. Communication is maintained with emails, meetings and newsletters. Additional programs include the school-based Trash On The Lawn Days, a school-wide waste audit, and an annual summit that highlights successful projects, provides training and is an opportunity to celebrate the efforts and commitment of these students.

Last year, AVR presented over 175 unique programs, including programs in over 75 Vermont schools, reaching some 26,000 Vermonters in support of waste reduction and recycling. The individuals who participate in Youth Environmental Coalition programs have gone on to affect positive change, by providing leadership and sharing their experiences in their new communities.

John Little – Bugworks

John Little has been a science teacher in the Missisquoi watershed for over 25 years, most recently as a physics teacher at North Country Union High School in Newport. John has served as chair and then President of the Missisquoi River Basin Association for over 10 years, working to enhance streambank stabilization and water quality monitoring data collection.

Bugworks is a program developed by John several years ago as a platform for teaching middle school students about the importance of riparian habitat and clean water. The program consists of an in-class session followed by a field trip to a nearby stream, pond, or wetland. By showing students that macroinvertebrates/bugs are the link in the food chain between leaves and the trout, John is able to engage students in a discussion as to why it is important to maintain forested riparian buffers, and to protect stream and river resources.

Bugworks was a pilot project for three years at Richford Elementary School and was introduced watershed-wide in 2008. With funding through environmental enforcement penalties provided to the Missisquoi River Basin Association, John was able to make the program available to 12 schools in the watershed, reaching a total of 426 students, 24 teachers, and 32 paraeducators. John hopes to find funding to continue the program in 2009 and also hopes that it will be integrated into the curriculum at schools.

One elementary teacher had this to say about Bugworks: "When I first explained to the kids what we'd be doing the last few days of the year, some (particularly girls) were less than enthusiastic. Their attitude changed as soon as they met John and we all headed to the pond. They were even willing to work on mini-reports after all grades were closed."

Environmental Excellence in Resource Conservation – The next award category is for Environmental Excellence in Resource Conservation. Award winning projects in this award category served either to conserve resources and protect the environment by minimizing resource consumption or by applying the strategies of reuse and recycling. This year we honor four award recipients.

Burlington Electric Department

In 2008, the Burlington Electric Department installed a regenerative selective catalytic reduction system to the McNeil Generating Station to reduce nitrogen oxide emissions, which boils down to this: cleaner air for the Burlington area, and a reduction of carbon monoxide (both a pollutant and a greenhouse gas). This project will result in the reduction of nitrogen oxides from the plant by more than 200 tons per year – over a 50% reduction.

This project was approved by over 90% of Burlington residents, proving once again the forward thinking of the city. Burlington Electric Department will now be able to better utilize the McNeil Station and put more energy dollars into the Vermont economy rather than export it out of state and country. By adding this unit, McNeil plant will now be able to sell Renewable Energy Credits in both Connecticutt and Massachusetts, allowing the plant owners to repay the investment in 2 to 3 years, and the ability to stabilize electric rates and invest in other clean renewable energy sources in the future.

DEW Construction Corporation –Resource Protection Program

DEW Construction Corporation is the third largest commercial contractor/construction manager in Vermont. DEW's Resource Protection Program has influenced all aspects of the company's

operations. DEW's Safety Health and Resource Protection (or SHARP) Committee, spearheads this program that drives the company to find ways to conserve resources, find alternatives to landfill disposal, salvage product and equipment, and reduce C&D waste. Here are some of DEW's resource protection initiatives.

DEW has greened its office operations by moving towards paperless meetings, submittals, and reports, and have adopted environmentally preferable purchasing practices.

DEW's new corporate headquarters is LEED certified (Leadership in Energy and Environmental Design) and serves as an example of their commitment to the environment.

DEW has instituted a Superintendent's student scholarship program using the revenues from metals recycling on construction projects to encourage students to enter the field of construction. Two scholarships are offered each year through VSAC for students demonstrating financial need, community service and involvement, and a work ethic.

DEW incorporates language into proposal requests and subcontractor agreements encouraging subcontractors and vendors to follow the principle of environmentally preferable purchasing.

DEW uses revenues from on-the-job recycling to provide pizza lunches for all workers on a construction project to further reinforce the benefits of recycling.

DEW has begun to use innovative methods to control construction site runoff. Instead of silt fences, DEW has used filter sock systems, consisting of 14 inch diameter sock tubes, one type filled with soil to act as a barrier, followed by another sock tube filled with mulch, compost, and seed to act as a fine filter for sediments.

Every project has as Waste Management Plan, so that waste management is not an afterthought. As a result of these plans, DEW is has taken the time to actually measure on-site recycling rates, and has been able to achieve recycling rates of 50% to 75% or more.

The SHARP team is tackling other issues dealing with vehicles and transportation as well as employee commuting.

Recycling, reuse, salvage, and general waste reduction are a part of every project at DEW, reinforced by the company's written policies. This message has reached the thousands of subcontractors with whom DEW does business. DEW is a model for the industry.

Ethan Allen Operations, Incorporated – Finishing Material Formulation and Electricity Usage Reduction

Ethan Allen manufactures hardwood furniture at two manufacturing plants in Vermont, one in Orleans and the other in Beecher Falls. Operations are similar at both plants, with manufacture and assembly of dining room tables, chairs, beds, end tables and case goods. The Ethan Allen plants are being recognized for two distinct projects.

The first project involves finishing material reformulation, a project that has been ongoing for more than 10 years and still continues. Solvent-based wood finishes (or laquers) typically contain hazardous air pollutants or HAPs which are regulated by the US EPA as well as the state. Ethan Allen has worked closely with material suppliers to reformulate the chemistry of the finishing materials that has resulted in a 95% reduction in HAPs. Although there are still solvents which evaporate through the drying and curing process, there are less of them and they are of much lower toxicity. Reformulation involved increasing the solids content of the finishing material in comparison to the solvent component. High solids coatings are more viscous liquids which can make application of these coatings more challenging. But with modern spray gun technology and a new Hot Spray technique, the challenges were overcome. The Hot Spray process decreased the viscosity of the finish material and allows for a quality finish with one coat, while, before, two applications were necessary.

In addition, the Beecher falls plant uses ultraviolet curable finishes on some of the less critical flat surface parts, such as table undersides, flat shelving parts, and drawer parts. These finishes have very low emissions of air pollutants and have contributed to overall emissions reductions.

Total HAP emissions at the two plants have dropped from 247,000 pounds in 1996 to 12,200 pounds in 2007. Another benefit has been a very significant reduction in hazardous waste that must be managed and shipped off-site for proper disposal.

The second project involves the implementation of 12 substantial energy savings projects at the two plants. Furniture manufacturing is an energy-intensive business. These projects include lighting fixture upgrades, exhaust controls, automatic dust system controls, compressed air system modifications, and the installation of a steam turbine to produce electricity from excess steam. These projects will save approximately 3.8 million KWh per year with an annual savings of $400,000 per year.

Both of these success stories have been long term projects, exemplifying Ethan Allen's commitment to environmental stewardship - as a leader in the furniture manufacturing industry.

Long Trail Brewing Company- Eco Brew

Long Trail Brewing Company, located in Bridgewater Corners, is a regional manufacturer of high quality handed-crafted ales that started operations in 1989. Long Trail Ale is Vermont's best selling craft beer. The brewery employs 40 Vermont-based employees and is among the top 25 craft breweries in the nation. Long Trail's commitment to resource conservation is matched by few others. Long Trail's location does not allow it access to municipal services such as water and sewer, like most other breweries, thus eco-efficient operations embodied in Long Trail's Eco Brew program are essential to the company's success.

Eco Brew, or *Environmentally Conscious Operations*, describes Long Trail's overall efforts to place environmental considerations at the forefront of all business and manufacturing decisions, focusing on the three R's – reduce, reuse and recycle. Notable accomplishments include water conservation, energy conservation, materials reuse, product design, and recycling and waste diversion.

Water is very important to the brewing process, not only as an ingredient in beer, but for sanitation, bottling, and packaging. Long Trail carefully monitors its water usage. It is reported that for a typical brewery, for each gallon of beer, another ten gallons of water is used during the brewing process and cleaning. Compared to the typical brewery's water:beer ratio of 11:1, Long Trail has been able to achieve a remarkable 2.37:1 water: beer ratio by employing a number of water conservation technologies. Here are just a few examples. Long Trail estimates that in 2007, it conserved 17.5 million gallons of water and avoided costs of over $386,000 for otherwise having to treat this wastewater.

Brewing uses a lot of hot water, and Long Trail manages to continually recapture the heat and reuse it through many heat exchanger loops in the facility. In 2007 Long Trail estimates that these energy conservation measures saved over 23,500 gallons of propane with nearly $50,000 in cost savings. Long Trail also sources 25% of the brewery's electrical needs from the CVPS Cow Power renewable energy program. This electricity is purchased at a premium and approximately 95% of this premium is paid to the farms which create this energy source. Long Trail is the largest company participating in this program.

Long Trail has reduced cardboard packaging of its product that resulted in a savings of over 183,000 square feet of cardboard. In addition, 77% of the cardboard used is from recycled fibers, saving over 5600 trees.

On average, Long Trail produces 7 tons of spent mash or grain each day. High in both protein and fiber, cows and dairy farmers love it. 1780 tons of material are diverted from the landfill at a savings of over $100,000 per year, not to mention the happy cows. Other solids generated from wastewater treatment, on the order of over 100 truckloads per year, are land applied as a soil conditioner on agricultural lands. On another note, Long Trail is working to reduce levels of nitrogen and phosphorus in its wastewater discharge even though it is not required to do so under its environmental permits.

Long Trail serves as a model for the industry.

Contribution to a More Sustainable Future – And finally, the last category is Contribution to a More Sustainable Future. Award winning projects in this category have achieved greater environmental and economic efficiency or economic justice by helping Vermonters to meet the needs of the present without compromising the ability of future generations to meet their own needs. This year we honor five award recipients.

The Center for Sustainable Innovation

The Center for Sustainable Innovation is a small non-profit corporation in Vermont that performs research, development, training and consulting in the areas of corporate sustainability management, or CSM. It was founded in 2004 and currently has six staff members, including its board.

The Center for Sustainable Innovation has developed an accounting method that seeks to measure the true sustainability performance of an organization across all three dimensions of the triple bottom line, the environment, society and the economy. This CSM accounting method is known as the Sustainability Quotients and the Social Footprint Method. Successfully used at Cabot Creamery and Ben & Jerry's, this original method develops or applies metrics that are systematically predicated on the need to ensure human well-being, and thereby takes actual social and environmental context into account.

The Center for Sustainable Innovation was set up as a non-profit organization to better contribute its work to the public domain. All CSI's documentation, case studies, articles, presentations, are available for public use and replication by any organization that cares about measuring its sustainability performance in a rigorous way.

Green Mountain Power Corporation – GMP Energy Plan for Cost, Carbon, and Reliability

Green Mt. Power is an electric utility serving 94,000 customers, or about one quarter of Vermont's population.

GMP has created an Energy Plan for the next 20 years and beyond based on projected needs, available sources, and dialogue with customers, state regulators and elected officials.

GMP has a vision for an energy future that delivers to its customers power with low carbon emissions, low cost, and high reliability.

As a cornerstone to the Plan are: (1) aggressively acquiring and building new, renewable generation; (2) actively promoting the designation of green energy incentive areas to encourage development of cost-effective, renewable energy; and (3) investing in efficiency and demand-side management. GMP believes that a proactive approach will allow the lowest cost, greenest, and most reliable energy for Vermonters in the long run.

In addition to its Energy Plan, GMP has created numerous initiatives using various techniques and technologies to encourage alternative energy. Here is a brief description of some of these:

Choose2BGreen is a program that provides customers with a mechanism to neutralize their carbon footprint through renewable power and home heating and driving offsets. GMP itself has become carbon neutral in its operations, which includes its offices, facilities, trucks, and all business travel. *Choose2BGreen* offers GMP customers the opportunity to sign up for three different programs directly on its web site: *Greener GMP*, *CoolHome*, and *CoolDriver*. Greener GMP allows customers to purchase energy form certified renewable resources equal to some or all of their monthly use. CoolHome and CoolDriver provide for carbon offsets from home heating and driving cars.

CoolHome and CoolDriver offsetting programs are offered in partnership with NativeEnergy, headquartered in Charlotte, VT. In addition, offsets for GMP's own operations are purchased from NativeEnergy. Funds raised through these programs are used to help finance the

construction of renewable energy projects, including Vermont and northeast-based methane and biomass projects.

SolarGMP is another program to encourage installation of solar panels for electricity. SolarGMP will pay generators of solar power extra money for the electricity they make and send to the grid. GMP is one of the few utilities in the country to propose a special bonus rate to solar generators.

In addition, GMP has shown its commitment by building its service center in Westminster to LEED-certified standards and planning to generate solar electricity here and at its other service centers in Colchester and Montpelier – to offset energy use up to 75%.

National Life Group

National Life Group, founded in 1848 and located in Montpelier, is a diversified family of financial service companies that offers a comprehensive portfolio of life insurance, annuity and investment products. It is a Fortune 1000 company that serves more than 700,000 customers and employs roughly 900.

National Life has an ongoing commitment to reduce its environmental footprint in regard to energy and natural resource use in its 500,000-plus square foot headquarters. In 2007, it transformed its Human Resources Department by installing environmentally friendly, zero VOC carpeting, installed new lighting technologies, including occupancy sensors, and automatic window blinds, to control heat loss and gain.

In 2008, National Life and its employees recycled over 67% of their waste from all sources and initiated an Alternate Transportation Program that offers incentives for not taking a car to work.

Also in 2008, the company installed 240 300-watt solar panels on the roof – the largest solar electric installation in the state. The electrical output is equivalent to that needed to power 13 homes. National Life also plans to install a solar thermal system to supply over 50 percent of hot water loads.

The company has recently re-lamped nearly 3000 light fixtures to save 158,000 KWh annually and is working on another 6000 fixtures. National Life has also consolidated and virtualized several hundred of its servers to HP Blade Servers which are more energy efficient saving over 170,000 KWh annually.

And finally, National Life is working with Efficiency Vermont to attain LEED-EB certification (Leadership in Energy and Environmental Design –Existing Buildings) for its 50 year old building. Experts say that LEED-EB certification would be a first for a 50-year old facility anywhere in the country.

We wish National Life continued success in this latest effort.

New England Slate Company

New England Slate Company in Poultney is a supplier of roofing slates for new construction and repair work. The company has six employees and serves customers primarily in the Northeast. The company recently re-located to Poultney from Pittsford in a move to address its business needs.

New England Slate's new building was designed and built with energy efficiency features and locally sourced materials to the greatest extent possible. Features of the building include: locally quarried slate roof; locally grown white pine used for exterior siding and interior applications; a high efficiency wood gasification boiler coupled with a recycled dairy storage tank to provide a constant source of heat from wood, an abundant local energy source; a superinsulated structure, and energy efficient doors, windows, and lighting. In addition, local slate rubble and crushed slate were used on the 3 acres used to store slate, and a storm water collection and storage system was put into place to minimize stormwater impacts on the nearby Poultney River.

It is estimated that these efficiency measures will save the NE Slate 1688 gallons of fuel a year, the equivalent of over 18 tons of CO2 emissions. NE Slate encourages the public to visit the building and they have a virtual tour on their web site to explain the features of the building.

The Vermont Sustainable Heating Initiative

Each winter, many Vermonters face a heating crisis, increasingly so with the continual rise in price of fossil fuels. The Vermont Sustainable Heating Initiative (or VSHI) posits the question of whether low income Vermonters should continue to receive assistance each year with more and more money, or whether that assistance should come in the form of more affordable, sustainable fuels.

VSHI, an organization of high school and college students working with adults to promote sustainable heating, was formed after the Governors Institute Winter Weekend of 2008, where over 200 high school students from 20 schools had gathered. The Initiative started a pilot program working with the Low Income Home Energy Assistance Program (LIHEAP) to transition low income homes off of expensive fossil fuels and electric heat to more affordable and sustainable pellet heat. The benefits of a pellet stove are numerous: pellet stoves are cleaner burning than traditional wood stoves, and will reduce particulate and volatile aromatic hydrocarbon emissions by hundreds of tons each year. Also, calculations have determined that the pay back period is a mere 3.6 years; add in the expectation that the rising price of fossil fuels and it drops even further. Finally, the money spent on pellet fuel has the potential to stay in Vermont with the advent of local pelletization.

VSHI has installed five pellet stove systems already, with the goal of up to 60 stoves in operation by next winter.