

Table 2-2. BNL Pollution Prevention, Waste Reduction, and Recycling Programs.

Waste Description	Type of Project	Pounds Reduced, Reused, Recycled or Conserved in 2009	Waste Type	Potential Costs for Treatment and Disposal	Cost of Recycle, Prevention	Estimated Cost Savings	Project Description Details *
Alkaline batteries	Recycling	200	Industrial waste	\$10	\$0	\$10	Two hundred pounds of alkaline batteries were collected and sent for recycling.
Solar-powered street lamp	Energy conservation	N/A	Greenhouse gas/Energy conservation	\$10,000	\$5,131	\$5,386	Installation of a solar-powered street lamp in the rear parking area of Building 490. Cost savings based on avoided costs of trenching and wire pulling.
Bio-diesel tank	Alternative fuels	0	Greenhouse gas/Energy Conservation	\$0	\$11,772	\$0	Per DOE Order 430.2B, BNL is utilizing bio-diesel to operate maintenance vehicles.
Sewage sludge and sand filter media	Landfill	9,690,000	Low-level Radiological waste	\$4,000,000	\$755,000	\$3,245,000	Processing, treatment, and disposal of sewage sludge and sand filter media from the BNL Sewage Treatment Facility—this process removed all low-level radioactive contaminants from the operating facility. The sludge can now be shipped to a municipally owned facility.
Recycling containers	Recycling	600	Industrial waste	\$3,000	\$3,253	\$0.00	Purchased four sets of recycling containers in 2008 to increase recycling rates in conference rooms.
Timer switches*	Energy conservation	N/A	Greenhouse gas/Energy	N/A	\$3,415	\$5,386	Installation of motion detector and infrared lighting in labs in Building 535
Water timers	Water conservation	80,000	Potable water	N/A	\$580	\$164	Water timers allow taps to be shut off after a specified amount of time running or a specified number of gallons are released, saving water and energy required to run the still.
Motion sensors for labs*	Energy conservation	N/A	Greenhouse gas/Energy Conservation	N/A	\$4,320	\$5,817	Installation of motion detector lighting in common areas of Buildings 490 and 463.
"Bio Circle Cleaner" parts washer	Substitution	640	Hazardous waste	\$10,000	\$4,461	\$10,000	Eliminates the need for toxic solvents, chemical storage, and disposal associated with the cleaning of vacuum parts.
Aerosol can disposal system	Recycling	528	Hazardous waste	\$12,000	\$0	\$12,000	Empty aerosol cans are recycled as scrap, rather than sent to the Waste Management Division as hazardous waste. Eight units (Facilities and Operations=5; Collider Accelerator =1; National Synchrotron Light Source=1; Basic Energy Sciences=1) each handle 66 lbs. of hazardous waste.
Portable closed-head drum mixer	Neutralization	1,600	Hazardous waste	\$15,089	\$0	\$15,089	The National Synchrotron Light Source purchased a closed drum mixer to neutralize Rydlyme, used to descale cooling pipes.
Formaldetox	Source reduction	280	Non-hazardous waste (neutralized approximately 1 gallon)	\$3,772	\$0	\$3,772	Neutralizes nonhazardous para-formaldehyde, chlorix, bleach, and rat blood.
High Performance Liquid Chromatography (HPLC) solvent recycler	Reuse	110	Hazardous waste	\$2,500	\$0	\$6,755	Allows reuse of approximately 50 liters of solvent and saves approximately 50 labor hours.
Propane cylinder de-valver	Recycling	75	Hazardous waste	\$7,500	\$0	\$7,500	The Collider Accelerator Division bought a propane cylinder de-valver to avoid sending cylinders to a disposal vendor at \$75 each; they are now recycled as scrap.

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Fluorescently-labeled oligonucleotides	Waste minimization	3,144	Radiological waste (396 ft ³); Mixed waste (35 gallons); Hazardous waste (108 gallons)	\$67,600	\$0	\$67,600	This project was cost-shared with Biology. The process avoids the use of radioactivity, thus avoiding radiological waste generation. This process won a 2008 DOE P2 Star Award.
Electronic recycling	Recycling	33,907	E-waste	\$84,768	\$2,300	\$82,468	The Laboratory has partnered with a government-based e-waste recycler (UNICOR), which guarantees that its e-waste is recycled in the most environmentally friendly manner. BNL pays shipping fees to the recycling facility.
Electronic Reuse	Reuse	22,851	E-waste	\$57,128	\$0	\$57,128	BNL tracks electronic equipment and takes a reuse credit for transfer of equipment to another user.
Building demolition recycling	Recycling	6,400,000	Industrial waste	\$291,200	\$32,000	\$259,200	On-site demolition products (steel and concrete) are segregated, recycled, and reused.
System One parts cleaner	Substitution	1,280	Hazardous waste	\$11,317	\$0	\$11,317	Central Fabrications and Motor Pool each purchased a System One parts washer to re-distill dirty solvent, eliminating the need for a vendor, such as Safety Kleen. Removed grit and sludge are mixed with the waste oil.
Photon-counting spectro-fluorimeter	Substitution	54	Mixed waste (2 ft ³)	\$20,730	\$0	\$70,730	Eliminated the need for radioactive assays and their radioactive waste. Savings include 1,000 work-hours and savings on material costs.
Replacement of mercury utility devices	Substitution	16	Mercury	\$2,350	\$4,000	\$2,350	Approximately 48 lbs. of mercury-containing devices were removed from utility devices during 2009. Savings are based on the cost of one mercury spill and cleanup.
Animal bedding conveying system	Composting	72,000	Low-level Radiological Waste	\$1,153,475	\$0	\$1,153,475	Animal bedding material is no longer sent to sanitary landfill. It is now conveyed to a dumpster that is emptied or composted at the stump dump.
Plant Engineering grounds vehicle wash system *	Waste minimization	8,000	Oils/grease to soils	\$16,000	\$3,000	\$13,000	This multi-year, multi-department project was completed in 2007 and eliminates the potential of oil and grease being released to soil.
Organic solvents	Substitution	678	Hazardous waste	\$1,694	\$0	\$26,000	Life Sciences utilizes a Microwave Peptide Synthesizer, which significantly reduces the hazardous wastes generated and saves ~1,000 work-hours/year (reflected in cost savings).
Organic solvents	Purification/reuse	44	Hazardous waste	\$110	\$0	\$3,510	The primary savings of the solvent purification system used by Basic Energy Sciences are in not purchasing new solvent and labor savings from not running the stills.
Cooling water	Reuse	63,400	Deionized water	\$0	\$0	\$7,925	A closed-cycle water recycling system for the Building 480 melt spinner saved 7,925 gallons of ultra-pure water and extends the life expectancy of equipment worth \$100,000.
Lead acid batteries	Recycled	7,920	Universal waste	\$59,753	\$0	\$59,753	Avoids hazardous waste disposal costs for approximately 40 lbs. of lead per battery.
Short half-life waste	Decay in storage	136	Radioactive waste	\$69,168	\$0	\$69,168	During 2009, 19 boxes of filters from Buildings 914 and 918 (136 ft ³) were managed in accordance with BNL decay-in-storage requirements, rendering the wastes eligible for volumetric release.

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Cooling Tower chemicals	Source reduction	9,563	Industrial waste	\$22,500	\$0	\$22,500	Ozone water treatment units were installed on cooling towers at SEM, the National Space Radiation Laboratory, and the Relativistic Heavy Ion Collider Research Facility for biological control of cooling water. These systems eliminate the need for water treatment chemicals (typically, toxic biocides), save labor, and reduce analytical costs for monitoring cooling tower blowdown.
Blasocut machining coolant	Recycled/ reused	30,480	Industrial waste	\$74,345	\$0	\$79,945	Central Shops Division operates a recycling system that reclaims Blasocut machining coolant and supplies it Laboratory-wide. In 2009, 3,340 gal (26,720 lbs.) of Blasocut lubricant were recycled. Recycling involves aeration, centrifuge, and filtration. This avoids cost of disposal as industrial waste and an avoided cost of buying seven drums of concentrate (\$800/drum) and 67 empty drums for shipping (\$50/drum).
Fluorescent bulbs	Recycled	11,780	Universal waste	\$88,875	\$20,000	\$68,875	Fluorescent bulbs are collected and sent to a recycling facility under the Universal Waste exemption rule.
Tyvek	Recycled	180	Industrial waste	\$10	\$0	\$10	BNL is recycling tyvek through Garment Recovery Systems.
Used motor oil	Energy recovery	12,544	Industrial waste	\$35,508	\$0	\$35,508	Used motor oil from the motor pool and the on-site gas station is given to Strelbel's Laundry Service to fire their boilers. In 2009, they collected 1,568 gallons of oil at no charge to BNL, which avoided the costs for disposal and 32 shipping drums (\$50/drum).
Office paper	Recycled	254,880	Industrial waste	\$13,509	\$0	\$13,509	Cost avoidance based on \$106/ton for disposal as trash.
Cardboard	Recycled	303,760	Industrial waste	\$16,099	\$0	\$16,099	Cost avoidance based on \$106/ton for disposal as trash.
Metals	Recycled	181,050	Industrial waste	\$9,596	\$0	\$27,701	Cost avoidance based on \$106/ton for disposal as trash, plus \$150/ton revenue.
Bottles/cans	Recycled	47,480	Industrial waste	\$2,516	\$0	\$2,516	Cost avoidance based on \$106/ton for disposal as trash.
Construction debris	Recycled	624,540	Industrial waste	\$14,052	\$0	\$14,052	Cost avoidance based on \$45/ton difference for disposal as trash
	TOTALS	17,863,720		\$6,176,173	\$849,232	\$5,481,217	

* Cost savings of projects funded by the BNL Pollution Prevention Council will be tracked for 3 years.