

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

Waste Description	Type of Project	Pounds Reduced, Reused, Recycled or Conserved in 2010	Waste Type	Potential Costs for Treatment and Disposal	Cost of Recycle, Prevention	Estimated Cost Savings	Project Description Details *
Replacement of mercury utility devices	Substitution	7	Mercury	\$4,000	\$6,750	\$4,000	Approximately 25 mercury containing thermometers were removed from the Collider Accelerator pump house. Savings are based on the cost of one mercury spill and cleanup.
Sewage sludge	Publicly Owned Treatment Works (POTW)	3,000	Low-level radiological waste	\$500,000	\$35,000	\$465,000	Radiological constituents were eliminated from the Sewage Treatment Facility and the sludge was sent to a POTW facility.
Alkaline batteries	Recycling	200	Industrial waste	\$10	\$0	\$10	200 pounds of alkaline batteries were collected and sent for recycling.
Solar-powered street lamp	Energy conservation	N/A	Greenhouse gas/Energy conservation	\$10,000	\$0	\$5,386	Installation of a solar-powered streetlamp 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	\$0	\$0	Per DOE Order 13514, BNL is utilizing different alternatives to operate maintenance vehicles.
Timer switches*	Energy conservation	N/A	Greenhouse gas/Energy conservation	N/A	\$0	\$5,386	Installation of motion detector and infrared lighting in labs in Building 535.
Water timers	Water conservation	80,000	Potable water	N/A	\$0	\$164	Water timers allow the taps to be shut off after a specific amount of time running or a specified number of gallons is released, saving water and energy required to run the still.
Motion sensors for labs*	Energy conservation	N/A	Greenhouse gas/Energy conservation	N/A	\$0	\$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	\$0	\$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	\$42,708	\$0	\$42,708	Empty aerosol cans are recycled as scrap, rather than sent to the Waste Management Division as hazardous waste. Eight units (Facilities & 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 bought a closed drum mixer to neutralize Rydlyme, used to descale cooling pipes.
Fluorescently-labeled oligonucleotides	Waste minimization	3,144	Radiological waste (396 ft <sup>3</sup> ), Mixed waste (35 gallons), Hazardous Waste (108 gallons)	\$72,600	\$0	\$72,600	This project was cost-shared with Biology. The process avoids the use of radioactivity, avoiding radiological waste generation, and won a 2008 DOE Pollution Prevention Star Award.
Electronic recycling	Recycling	33,470		\$83,675	\$0	\$83,675	After an extensive audit review, BNL's e-waste is now collected by the Laboratory's metals recycler, which guarantees that e-waste is recycled in the most environmentally friendly manner.
Electronic reuse	Reuse	34,095	E-waste	\$85,238	\$0	\$85,238	The Laboratory tracks electronic equipment and earns a reuse credit for transfer of equipment to another user.
Building demolition recycling	Recycling	7,040,000	Industrial waste	\$372,000	\$32,000	\$340,000	On-site demolition products (steel and concrete) are segregated, recycled, and reused.
System One parts cleaner	Substitution	1,280	Hazardous waste	\$10,677	\$0	\$10,677	Central Fabrications and the 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.

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Photon-counting spectro-fluorimeter	Substitution	54	Mixed waste (2 ft <sup>3</sup> )	\$28,842	\$0	\$78,842	Eliminated the need for radioactive assays and their radioactive waste. Savings include 1,000 work-hours, as well as savings on material costs.
Animal bedding conveying system	Composting	82,000	Low-level Radiological Waste	\$780,192	\$0	\$780,192	Animal bedding material is no longer sent to the sanitary landfill; it is now conveyed to a dumpster that is emptied or composted at the stump dump.
Organic solvents	Purification/reuse	44	Hazardous waste	\$110	\$0	\$3,510	The primary savings of the Basic Energy Sciences solvent purification system are in not purchasing new solvent and labor savings from not running the stills.
Lead acid batteries	Recycled	3,200	Universal waste	\$22,778	\$0	\$22,778	Avoids hazardous waste disposal costs for approximately 40 lbs of lead per battery.
Short half-life waste - Collider Accelerator	Decay in storage	142	Radioactive waste	\$48,848	\$0	\$48,848	During 2010, 21 boxes of filters from Buildings 914 and 918 (147 ft <sup>3</sup> ) were managed in accordance with BNL decay-in-storage requirements, rendering the wastes eligible for volumetric release.
Short half-life waste - Medical Department	Decay in storage	12	Radioactive waste	\$4,128	\$0	\$4,128	During 2010, 9 boxes (12 ft <sup>3</sup> ) were managed as Regulated Medical Waste in accordance with BNL decay-in-storage requirements, rendering the wastes eligible for volumetric release.
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	38,640	Industrial waste	\$66,490	\$0	\$74,490	Central Shops Division operates a recycling system that reclaims Blasocut machining coolant and supplies it Laboratory-wide. In 2010, 4,830 gallons (38,640 lb) of Blasocut lubricant were recycled. Recycling involves aeration, centrifuge, and filtration and avoids the cost of disposal as industrial waste and an avoided cost of buying 10 drums of concentrate (\$800/drum) and 97 empty drums for shipping (\$50/drum).
Fluorescent bulbs	Recycled	8,839	Universal waste	\$62,916	\$20,000	\$42,916	Fluorescent bulbs are collected and sent to a recycling facility under the Universal Waste exemption rule.
Tyvek	Recycled	180	Industrial waste	\$11	\$0	\$11	BNL is recycling tyvek through Garment Recovery Systems
Used motor oil	Energy recovery	13,600	Industrial waste	\$31,140	\$0	\$31,140	Used motor oil from the motor pool and the on-site gas station is given to Strebel's Laundry Service to fire their boilers. In 2010, they collected 1,700 gallons of oil at no charge to BNL, which avoided the costs for disposal and 34 shipping drums (\$50/drum).
Office paper	Recycled	348,000	Industrial waste	\$21,750	\$0	\$21,750	Cost avoidance based on \$106/ton for disposal as trash.
Cardboard	Recycled	282,000	Industrial waste	\$17,625	\$0	\$17,625	Cost avoidance based on \$106/ton for disposal as trash.
Metals	Recycled	262,000	Industrial waste	\$16,375	\$0	\$42,575	Cost avoidance based on \$106/ton for disposal as trash, plus \$150/ton revenue.
Bottles/cans	Recycled	48,000	Industrial waste	\$3,000	\$0	\$3,000	Cost avoidance based on \$106/ton for disposal as trash.

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Construction debris	Recycled	832,000	Industrial waste	\$22,880	\$0	\$18,720	Cost avoidance based on \$45/ton difference for disposal as trash
	<b>TOTALS</b>	<b>9,123,231</b>		<b>\$1,851,581</b>	<b>\$52,000</b>	<b>\$1,889,774</b>	

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