Subject:	Photon Sciences Environmental Awareness for Water Systems (Course Code PS-ENV-WATER)		
Number: PS-TRN-CRM-0009	**Revision:** C	**Effective:** 01/03/2013	**Page** 1 **of** 3

Prepared By:	Approved By:	
Mary Anne Corwin	Ron Beauman Debbie Bauer	

*Approval signatures on file with master copy.

Revision Log

Instructions: Read the material below and then close this document. You will receive credit for training through the BNL training system.

Course Objective: Maintenance activities on process Deionized (DI) and Cooling Tower (Condenser) water systems have significant environmental aspects associated with their operation. This course has been designed to provide you with the job-specific information that you need know to protect the environment and to meet Laboratory and Government regulations for chemical storage, water discharges and hazardous wastes. The contents of this training have been extracted from the PS PRM and BNL Subject Areas.

Description of the Significant Environmental Aspects:

Condenser System: Maintenance of this system involves discharges of cooling water to the sanitary and stormwater systems when cooling tower blowdowns occur. The water in the cooling tower system contains anti-corrosion and anti-foulant chemicals. Certain chemicals have been previously approved by the Environmental Protection Division (EPD) as acceptable for discharge into sanitary and stormwater systems.

DI System:
The deionizers contain mixed-bed resin pellets that keep process water at the desired resistivity by removing metal ions, which continually enter the water due to corrosion of the components being cooled. Since this water is continually cleaned, it can be drained directly to the sanitary system.

When the pellets become overloaded with metal ions, they are regenerated (i.e. cleaned) for reuse in the system. Regeneration results in the generation of industrial waste and hazardous waste as well as some rinse water that can be drained directly to the sanitary system with proper approval.

The regeneration process results in multiple drums of waste solutions that need to be stored until picked up and disposed of by the Waste Management Group. Drum storage must be done in compliance with Suffolk County Department of Health requirements.

Authorization Requirements:

To perform any work on the DI system or the Condenser system, personnel must first be authorized by their supervisors and the NSLS Utilities Engineer. At minimum, authorization to work on either system requires the completion of job specific training established by the NSLS Utilities Engineer and completion of this environmental awareness training.

Operational Controls:

Condenser System: Cooling water from the Condenser system may be directly discharged to sanitary or storm drains as long as approved chemicals are used in the system. If new chemicals are procured for use, EPD must be contacted in order to evaluate these chemicals for discharge.

DI Systems: Water from the DI system can be directly discharged into the sanitary system. Regeneration of the mixed bed resin deionizers produces hazardous waste (acid), industrial waste (metal-ion containing wastewater) as well as wastewater acceptable for discharge into the sanitary system. Specific procedures have been developed to ensure proper regeneration and handling of the wastewater and the proper storage of drums produced by the mixed bed regeneration process. These procedures should

always be used by personnel when regenerating the mixed bed resin deionizers. Contact the Utilities Engineer if you have questions about the procedures.

Response to Leaks: Technicians and engineers who are involved in regeneration activities should be sensitive to leaks to floor drains or other discharge points to the environment. Leaks should be secured to the extent possible and reported to the NSLS Control Room Operator (x2550) and Lab emergency response number (x2222) as soon as possible so that Sewage Treatment Plant and Environmental personnel can be prepared for potential impacts at the Sewage Treatment Plant.

Your Role and Responsibility: As a member of the operating group for the NSLS deionizer systems and cooling systems, it is important that you follow the procedures and other instructions established by the NSLS Utilities Engineer and take prompt action in the event of spills. If you are ever in doubt regarding the proper course of action, contact the Utilities Engineer or a member of the Photon Sciences ESH Staff.

Potential Regulatory and Environmental Impacts: Mismanagement of the waste produced by the mixed bed regeneration process may result in violations of BNL sewage release limits and RCRA hazardous waste regulations, and potentially result in contaminated soil or groundwater. In addition, improper drum storage of waste water can result in a violation of Suffolk County storage regulations. BNL is subject to fines and penalties for such violations, and is responsible for the clean-up costs associated with any required remediation.

Pollution Prevention and Waste Minimization: Please offer suggestions and comments to the Utilities Engineer about pollution prevention and waste minimization. Recent efforts to reduce waste generation in this system include the use of pre-deionized make-up water to lower the frequency of resin bed regeneration. Other ideas may help continue this type of waste minimization.

Document Review Frequency	
3	Years

Review signatures on file with master copy of controlled document

PHOTON SCIENCES DIRECTORATE Revision Log	
Document Number:	PS-TRN-CRM-0009
Subject	Photon Sciences Environmental Awareness for Water Systems (Course Code PS-ENV-WATER)

Rev	Description	Date
A	Document transferred from LS-TRN-CRM-0009 to PS-TRN-CRM-0009. No other changes.	12-14-2011
B	Changed course code from LS-ENV-WAT to PS-ENV-WATER.	04-27-2012
C	Modified section for Authorization Requirements and changed NSLS ESH Staff to Photon Sciences ESH Staff.	01-03-2013