

**U.S. Department of Energy · Office of Fossil Energy
National Energy Technology Laboratory**

Annual Site Environmental Report for Calendar Year 2005



2005 Annual Site Environmental Report

October 2006

U.S. Department of Energy
National Energy Technology Laboratory
Morgantown, West Virginia
Pittsburgh, Pennsylvania
Albany, Oregon
Tulsa, Oklahoma
Fairbanks, Alaska
NETL Customer Service Line: (800) 553-7681
www.netl.doe.gov

Disclaimer

This report was prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately-owned rights. Reference therein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U.S. Government or an agency thereof. The views and opinions of authors expressed therein do not necessarily state or reflect those of the U.S. Government or any agency thereof.

Table of Contents

1.0 EXECUTIVE SUMMARY 1

2.0 INTRODUCTION..... 4

 2.1 *General Information*..... 4

 2.2 *NETL Timeline* 7

 2.3 *Discussion of Sites within the Document* 10

 2.4 *Awards and Environmental Stewardship Recognition* 10

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)..... 12

 3.1 *Introduction to NETL's EMS*..... 12

 3.2 *Environmental Policy*..... 13

 3.3 *Identification of Environmental Aspects and Impacts*..... 14

 3.4 *Environmental Objectives and Targets*..... 14

 3.5 *Environmental Planning and Analysis Procedures*..... 15

 3.6 *Implementation and Operational Controls* 16

 3.7 *Self-Assessment Procedures and Corrective Action*..... 20

 3.8 *Quality Assurance* 25

 3.9 *Management Review Process*..... 26

4.0 COMPLIANCE SUMMARY..... 26

 4.1 *Major Environmental Statutes* 26

 4.2 *Environmental Executive Orders* 26

 4.3 *DOE Internal Environmental and Radiation Protection Orders* 26

 4.4 *Atomic Energy Act of 1954*..... 27

 4.5 *Compliance and/or Cleanup Agreements*..... 27

 4.6 *Environmental Violations Cited by Regulators*..... 28

 4.7 *Notices of Violation, Notices of Deficiency, Notices of Intent to Sue, and Other Enforcement Actions Issued.* 28

 4.8 *Reportable Occurrences*..... 29

 4.9 *Major Issues, Instances of Non-compliance, and Corrective Actions*..... 30

 4.10 *Status of Ongoing Self-Assessments and/or Environmental Audits*..... 30

 4.11 *Existing Permits* 30

 4.12 *Emergency Preparedness*..... 30

 4.13 *Quality Assurance* 30

 4.14 *Performance Measurement* 33

BEGIN SEPARATE SITE ANALYSIS..... 34

5.0	MORGANTOWN	34
5.1	<i>Site Description.....</i>	34
5.2	<i>Major Site Activities.....</i>	35
6.0	COMPLIANCE STATUS.....	35
6.1	<i>Environmental Restoration and Waste Management.....</i>	35
	6.1.1 <i>Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)..</i>	35
	6.1.2 <i>SARA Title III.....</i>	36
	6.1.3 <i>RCRA Program</i>	37
6.2	<i>National Environmental Policy Act.....</i>	40
6.3	<i>TSCA.....</i>	43
6.4	<i>Radiation Protection.....</i>	44
6.5	<i>Air Quality and Protection Activities.....</i>	44
6.6	<i>Water Quality and Protection.....</i>	46
6.7	<i>Executive Orders.....</i>	49
	6.7.1 <i>EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.....</i>	50
	6.7.2 <i>EO 13123, Greening the Government through Efficient Energy Management.....</i>	52
6.8	<i>Groundwater and Soil Quality Protection Activities.....</i>	52
7.0	PITTSBURGH	57
7.1	<i>Site Description.....</i>	57
7.2	<i>Major Site Activities.....</i>	57
8.0	COMPLIANCE STATUS.....	58
8.1	<i>Environmental Restoration and Waste Management.....</i>	58
	8.1.1 <i>Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)..</i>	58
	8.1.2 <i>SARA Title III.....</i>	59
	8.1.3 <i>RCRA Program</i>	60
8.2	<i>National Environmental Policy Act.....</i>	63
8.3	<i>TSCA and FIFRA.....</i>	63
8.4	<i>Radioactive Materials.....</i>	64
8.5	<i>Air Quality and Protection Activities.....</i>	65
8.6	<i>Water Quality and Protection Activities.....</i>	66
8.7	<i>Executive Orders.....</i>	69
	8.7.1 <i>EO 13149 -- Greening Government through Federal Fleet and Transportation Efficiency</i>	69
	8.7.2 <i>EO 13101 -- Greening the Government Through Federal Acquisition.....</i>	70
	8.7.3 <i>EO 13123 -- Greening the Government through Efficient Energy Management.....</i>	71
8.8	<i>Groundwater and Soil Quality and Protection Activities.....</i>	73
9.0	ALBANY.....	80
9.1	<i>Site Description.....</i>	80
9.2	<i>Major Site Activities.....</i>	81

10.0	COMPLIANCE STATUS.....	81
10.1	<i>Environmental Restoration and Waste Management.....</i>	81
	10.1.1 <i>Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).....</i>	81
	10.1.2 <i>SARA Title III.....</i>	82
	10.1.3 <i>RCRA Cleanups.....</i>	82
10.2	<i>National Environmental Policy Act.....</i>	82
10.3	<i>TSCA.....</i>	82
10.4	<i>Radiation Protection.....</i>	82
	10.4.1 <i>Ionizing Radiation Program.....</i>	82
	10.4.2 <i>Laser Program.....</i>	83
10.5	<i>Air Quality and Protection.....</i>	83
10.6	<i>Water Quality and Protection Activities.....</i>	83
10.7	<i>Executive Orders and DOE Orders.....</i>	84
	10.7.1 <i>EO 13149, Greening the Government through Federal Fleet and Transportation Efficiency.....</i>	84
	10.7.2 <i>EO 13148, Greening the Government through Leadership in Environmental Management.....</i>	84
	10.7.3 <i>EO 13123 -- Greening the Government through Efficient Energy Management.....</i>	87
	10.7.4 <i>EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.....</i>	87
	10.7.5 <i>DOE Order 435.1, Radioactive Waste Management.....</i>	87
10.8	<i>Groundwater and Soil Quality Protection Activities.....</i>	87
10.9	<i>Other Major Environmental Issues and Actions.....</i>	88
11.0	TULSA.....	89
11.1	<i>Site Description.....</i>	89
11.2	<i>Major Site Activities.....</i>	89
12.0	COMPLIANCE STATUS.....	89
12.1	<i>Environmental Restoration and Waste Management.....</i>	89
12.2	<i>National Environmental Policy Act.....</i>	90
12.3	<i>TSCA and FIFRA.....</i>	90
12.4	<i>Radiation Protection.....</i>	90
	12.4.1 <i>Ionizing Radiation Program.....</i>	90
	12.4.2 <i>Laser Program.....</i>	90
12.5	<i>Air Quality and Protection.....</i>	90
12.6	<i>Water Quality and Protection Activities.....</i>	91
12.7	<i>Executive Orders.....</i>	91
	12.7.1 <i>EO 13148 -- Greening the Government through Leadership in Environmental Management.....</i>	91
	12.7.2 <i>EO 13123 -- Greening the Government through Efficient Energy Management.....</i>	92
	12.7.3 <i>EO 13101, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.....</i>	92
12.8	<i>Groundwater and Soil Quality Protection Activities.....</i>	92
12.9	<i>Other Major Environmental Issues and Actions.....</i>	92

13.0 FAIRBANKS..... 93

 13.1 Site Description..... 93

14.0 COMPLIANCE STATUS..... 93

 14.1 Environmental Compliance..... 93

 14.2 National Environmental Policy Act..... 93

 14.3 EO 13148 -- Greening the Government through Leadership in Environmental Management. 93

 14.4 Other Major Environmental Issues and Actions 94

APPENDIX..... 95

 Table 3.3 Significant Environmental Aspects – Pittsburgh and Morgantown..... 98

 Table 3.4 EMP Objectives and Targets – Pittsburgh and Morgantown..... 98

 Table 4.4.a Morgantown Radioactive Materials Inventory December 2005 100

 Table 4.4.b 2005 Radioactive Sealed Sources in Use at the Pittsburgh Site..... 100

 Table 4.4.c 2005 X-Ray Radiation Generating Devices..... 101

 Table 4.11 Summary of Permits – Morgantown Site..... 101

 Table 4.14.a – 2005 Environmental Management Plan (EMP) Status..... 102

 Table 4.14.c -- Summary of EMP Activity..... 109

 Table 4.14.b Surveillance Monitoring..... 110

 Table 6.1.1 NETL Potential Contamination Sources and Cleanup Actions 111

 Table 6.1.2 Properties of Potential Contaminants 112

 Table 6.1.3a Hazardous Waste Generation NETL-Morgantown 113

 Table 6.5 Air Emissions Permits – Morgantown Site..... 113

 Table 6.6.1.a -- NPDES Permit Storm Water Monitoring Requirements and Limits 113

 Table 6.6.1.b NETL-Morgantown NPDES Storm Water Analysis Results 114

 Table 6.6.1.c Surveillance Monitoring 115

 Table 6.6.1.d NETL-Morgantown 2005 Wastewater Effluent Analysis (lb/d);..... 116

 Table 6.8.1.a NETL-Morgantown June 2005 Groundwater Data for “A” Aquifer 119

 Table 6.8.1.b NETL-Morgantown June 2005 Groundwater Data for “B-C” Aquifer 119

 Table 6.8.1.c NETL-Morgantown June 2005 Groundwater Data for Morgantown Aquifer..... 119

 Table 8.1.2 Tier II Chemical Inventory Reporting List 120

 Table 8.3.1TSCA Chemical Held Onsite In Excess Of 10 Lbs. 120

 Table 8.3.2 2004 Radioactive Sealed Sources in Use at the Pittsburgh Site..... 120

 Table 8.3.3 2004 Radiation Generating Devices: X-ray Devices..... 120

 Table 8.5.1 2005 Air Emissions Annual Report 121

 Table 8.6.1 NETL-PGH Industrial Sewer Use Permit (Building 74) Monitoring Analysis..... 122

 Table 8.6.2 Building 74 Monthly Monitoring results 123

 Table 8.6.3 NETL-PGH 2005 National Pollutant Discharge Elimination System Storm Water Analysis Results..... 124

 Figure 8.8.3NETL-Pittsburgh Groundwater Management Program Main Plateau Well Locations 125

 Figure 8.8.4 NETL-Pittsburgh Groundwater Management Program Valley Fill Well Locations 126

 Table 8.8.5 NETL-PGH 2005 Groundwater Detection Monitoring Program – Results of Analysis 127

 Figure 10.8 NETL-Albany Groundwater Monitoring Well Network (July 2002)..... 128

2005 NETL ANNUAL SITE ENVIRONMENTAL REPORT

1.0 EXECUTIVE SUMMARY

The National Energy Technology Laboratory (NETL) has sites in Morgantown, West Virginia; Pittsburgh, Pennsylvania; Tulsa, Oklahoma; Albany, Oregon; and Fairbanks, Alaska (AEO). In total, these sites include 81 buildings and 14 major research facilities on nearly 200 acres. More than 1,100 employees work at NETL's five sites; roughly half are federal employees and half are site support contractors. Four principal sites and one satellite office, AEO, constitute NETL. Each office is located in a different state, is subject to different state and local laws, and focuses on different activities.

Among the most significant changes to NETL in 2005 was the realignment and incorporation of the Albany Research Center (ARC) into the NETL family as NETL-Albany. This event took place in November 2005. NETL-Albany specializes in life cycle research and investigates new materials to solve the energy system challenges of today and tomorrow. At about the same time as the realignment, NETL-Albany was certified to the ISO 14001:1996 standard. ARC had been ready to be assessed against the more current 2004 standard at the time of the 14001 certification, but was informed that the infrastructure for auditing against the more current standard was not yet fully in place.

NETL-Pittsburgh and NETL-Morgantown have implemented an EMS based on the ISO 14001 standard and were independently certified in 2005 to be in full compliance with the ISO 14001 standard. As mentioned, NETL-Albany received certification in November 2005 based on their Albany Management System (AMS). NETL-Pittsburgh and NETL-Morgantown received certification in August 2003 and maintained that certification throughout 2004 and 2005. NETL-Tulsa and NETL-Fairbanks are not required to have an EMS because these two operations are not a "facility" as defined by EO 13148 and are strictly limited to desktop operations which do not impact environmental programs.

The scope of the Albany Management System (AMS) for the Albany site covers onsite R&D activities. The AMS also addresses the requirements for controlling the impact of NETL-Albany's operations on the environment, on the health and safety of the site's employees, and on the local community. The scope of the EMS for the Pittsburgh and Morgantown sites covers onsite operations involving NETL employees at the Morgantown and Pittsburgh sites, including onsite R&D activities, site operations, and the supporting administrative functions related to these activities and operations. Operations not owned or controlled by NETL are excluded from the EMS, such as the credit unions, childcare facilities, and the Navy tower operations.

Another significant event taking place in 2005 was the discovery of certain volatile organic compounds (VOCs) at levels above Oregon Department of Environmental Quality (DEQ) risk-based standards in the groundwater at NETL-Albany, including under the Liberty Elementary School located adjacent to the site, and in drinking wells used by nearby local residents. The major contaminants of potential concern that have been detected are

trichloroethene (TCE), tetrachloroethene (PCE), carbon tetrachloride, and chloroform. NETL-Albany began its Groundwater Monitoring Program (Program) on site in 2001 and offsite in March 2005. Because of the presence of the VOCs, NETL continues to monitor the groundwater both on and off-site and sample the affected residential wells, NETL works closely with the Oregon DEQ, the appropriate regulatory authority, to investigate the nature and extent of the contamination, as well as to consider appropriate remediation methods. There is the potential that DOE may have some liability associated with the groundwater contamination at Liberty Elementary School and/or the well contamination at several surrounding residences if the ongoing investigation reveals that NETL is a source of the contamination. The City of Albany tested and certified the drinking water, both on-site at NETL and at Liberty Elementary School, and certified that it does not contain VOCs above federal drinking water standards. Furthermore, TCE, the prevalent VOC detected off-site, is a common chemical found in cleaners, degreasers, and paint thinners, the source of which may be from gas stations, dry cleaners, repair shops, or other former businesses using such chemicals in the immediate vicinity of the Albany site. It is anticipated that Albany will investigate potential off-site sources. Since there has been no determination of the source(s) of the VOCs, no enforcement action has been initiated by the Oregon DEQ against the DOE.

The Albany site was engaged in a variety of metallurgical and materials research projects and activities, some of which involved beryllium (Be), until the early 1980s. In 2005, beryllium surface contamination above the threshold limits for contamination specified in 10 Code of Federal Regulations (CFR) Part 850 was discovered in several areas at the Albany site. In response, NETL-Albany began a systematic process of identifying all Be-contaminated areas and evaluating the potential levels of residual Be throughout the site. NETL-Albany has sampled the facility for the potential spread of Be, and is currently conducting an inventory sampling. The Be contamination is limited to on-site contamination of facilities, infrastructure, and equipment.

To limit potential exposure of its employees to Be, the site has restricted access to a number of its facilities and requires personal protective measures be taken for all individuals needing access to these restricted areas to perform their work. Taking a conservative approach, the site implemented additional worker safety measures consistent with the provisions of 10 CFR Part 850 by establishing a chronic Be disease prevention program. Employees were provided with Be awareness training in July 2005, and a computer-based training module was created for refresher training. Further, anyone coming on site must complete the computer-based training module. Visitors who will be entering areas of restricted access must receive a normal result to the Be Lymphocyte Proliferation Test (BeLPT) and be outfitted with the appropriate personal protective equipment.

Once the Be inventory is complete, a hazard assessment will be conducted to determine the potential risk to employees of working in various facilities onsite. Following the hazard assessment, a post-hazard assessment will be conducted to identify and determine the appropriate remedial action(s) that may need to be taken to cleanup the Be contamination.

There was a single notice of violation (NOV) issued to NETL-Morgantown related to a discharge of water from #3 containment pit for the Gas Process Development Unit (GPDU).

The water had a lower-than-allowable pH from acid contamination of the rainwater in the pit. The Clarifier waste water pretreatment operation that was designed to treat such waste failed to operate properly. As a result, waste water with a pH outside the range acceptable by the waste water permit was discharged, resulting in the NOV being issued by the West Virginia Department of Environmental Protection. NETL-Albany, NETL-Pittsburgh, NETL-Tulsa, and NETL-Fairbanks did not receive any NOVs in 2005.

NETL filed six occurrence reports in 2005 into the DOE Occurrence Reporting and Processing System (ORPS). One report was for the NOV that was received in Morgantown (discussed above), one was for a fire line break at NETL-Pittsburgh that released turbid water into a nearby waterway, two reports were for fire line breaks that created a fire safety class system breach at NETL-Pittsburgh, and two were near-miss reports at NETL-Pittsburgh that did not create any harm or damage, but were reported because there was only a single intervening barrier that prevented the incident from being an actual occurrence.

There were no nuclear events at any of the NETL sites involving the use, exposure, contamination, cleanup, release, legacy, regulation, or extent of control of radioactive materials. NETL is a non-nuclear facility with only a minimal number of radioactive materials in use on instruments and scanners.

NETL implements a recycling program as part of a larger program for waste prevention. An affirmative procurement program makes employees aware of the requirements and opportunities for purchasing products designated by the EPA for recycled content. Government credit card purchases are monitored for compliance, and metrics are tallied each year for purchases by the warehouse and others. NETL-Pittsburgh has recently implemented a recyclables sorting effort, which has added several metric tons of recyclables to the recycle stream while removing the same amount from the waste stream. Employees who are cleaning out offices because of retirement, relocation, or just for housekeeping are provided with large, wheeled bins into which they can dump all their used and recyclable office material. The bins are subsequently taken to the recycling building where appropriately-trained employees remove the recyclables from the bins and sort them into the proper receptacles. On average, the large bins contain approximately 200 – 350 pounds of used and recyclable office material, but after sorting, only contain approximately 30 – 50 pounds of non-recyclable trash.

NETL demonstrated efficient energy management leadership throughout 2005. This leadership is made difficult by the age of many of the facilities and systems used on the sites. These facilities and systems were constructed using inefficient materials at a time when energy conservation was not a priority. Despite this handicap, NETL is aggressive in providing the most energy efficient management of facilities possible. For example, lighting retrofits are now a routine part of all construction/renovation packages in which inefficient fixtures are replaced with more efficient, 277-volt Energy Star-rated, electronic ballast, fluorescent fixtures. Motion sensors have been installed to conserve energy in areas under intermittent use such as restrooms. NETL has incorporated energy efficient designs and Energy Star equipment into construction, remodeling, and maintenance projects. The

FY2005 Energy and Utilities Management Performance Agreement included the following seven energy management performance objectives: (1) administer energy management initiatives consistent with the comprehensive Energy Management Plan; (2) meet the FY 2005 energy reduction goal of 20 percent (on a per square foot basis) in laboratory and industrial facilities compared to a 1990 baseline; (3) develop and implement water efficiency programs and plans; (4) evaluate and attempt to qualify office buildings for receipt of the Energy Star Building label by December 31, 2004; (5) increase the number of energy management retrofit projects that are funded and completed on site; (6) increase the use of off-grid-generated electricity; and (7) plan for and ensure the efficient and economical acquisition, management, and use of energy and utilities.

Twenty active groundwater monitoring wells exist at the Morgantown site. These wells monitor two shallow aquifers within the unconsolidated Lake Monongahela sediments and one bedrock aquifer, the Morgantown Sandstone. None of these aquifers are used as a source of water in the immediate area. One well (SP8-A) completed in the Lake Monongahela sediments was plugged during 2005 due to construction of the new administration building in the former parking lot north of B-25. All wells are sampled annually for pH, water level, conductivity, and temperature. No groundwater contaminants have been consistently detected at higher than regulatory levels at the site. Groundwater monitoring is focused primarily on past spills, leaks, and the effectiveness of the cleanup actions undertaken. The section on CERCLA in the report lists the historical events and the current status of these spill sites.

The vast majority of domestic water supplies for the area surrounding the NETL-Pittsburgh site are provided by the Pennsylvania American Water Company, which uses water taken from the Monongahela River. There was, however, at least one groundwater well listed for domestic usage within a one-mile radius of the site. That well is located north of NETL-Pittsburgh, so it should not be affected by groundwater impacts caused by NETL due to the assumed southerly groundwater flow beneath the Lick Run Valley. Statistical analysis was conducted on two indicators of groundwater contamination (pH and specific conductance) in seven of the NETL-Pittsburgh monitoring wells in 2005. The analysis compared the up-gradient wells to the down-gradient wells. The results of this statistical analysis showed that no wells were outside of the background tolerance intervals for pH, and two wells were outside the background tolerance limit for specific conductance.

Please refer to the remaining text of this report for a fuller description of all environmental activities conducted at NETL in FY 2005.

2.0 INTRODUCTION

2.1 General Information

The National Energy Technology Laboratory (NETL) is part of DOE's national laboratory system. The only U.S. national laboratory devoted to fossil energy research, it is owned and operated by the U.S. Department of Energy (DOE). NETL

supports DOE's mission to advance the national, economic, and energy security of the United States.

NETL has expertise in coal, natural gas, and oil technology research, contracting and project management of fossil energy research, systems analysis of energy conversion technologies, and energy supply and production issues from both a national and international perspective. In addition to research conducted onsite, NETL's project portfolio includes research and development conducted through partnerships, cooperative research and development agreements, financial assistance agreements, and contractual agreements with universities and the private sector. Together, these efforts focus a wealth of scientific and engineering talent on creating commercially viable solutions to energy and environmental problems.



NETL has sites in Morgantown, West Virginia; Pittsburgh, Pennsylvania; Tulsa, Oklahoma; Albany, Oregon; and Fairbanks, Alaska. In total, these sites include 81 buildings and 14 major research facilities on nearly 200 acres. More than 1,100 employees work at NETL's five sites; roughly half are Federal employees and half are site support contractors.

NETL is organized into six strategic units:

The **Strategic Center for Natural Gas and Oil** (SCNGO) integrates all elements of



DOE's natural gas and oil research. SCNGO is charged with implementing science and technology development to resolve the environmental, supply, and reliability constraints of producing and using oil and gas resources – resources that account for more than 60 percent of the energy consumed in the United States. With core competencies and expertise in all aspects of natural gas and oil, SCNGO investigates and manages research and

development leading to improved natural gas and oil production and use. SCNGO invests in projects that promise tangible benefits to the nation, including a cleaner environment and increased domestic natural gas and oil production.

The **Strategic Center for Coal (SCC)** works to ensure national energy security and economic prosperity through the production of clean, affordable electricity and fuels, including hydrogen, from coal, the nation's most abundant energy resource. The SCC is charged with implementing research, development, and demonstration activities to resolve the environmental, supply, and reliability constraints of producing and using coal resources. Environmentally responsible coal production technologies will allow the United States to meet growing electricity demand and to lay the foundation for a sustainable hydrogen economy.

The **Office of Systems, Analyses and Planning (OSAP)** conducts studies of complex, large systems, such as industrial or ecological processes, and the interactions among those systems, including social, economic, political, regulatory, technological, design, and management institutions, each of which are systems in their own right. The complex nature of these systems requires an interdisciplinary approach. System studies provide input to decisions on issues such as national energy plans and programs, resource use and environmental and energy security policies, research and development directions, and deployment of energy technologies. System studies are also used to support planning exercises at various organizational levels. Systems analysis focuses on production and processing of fossil fuels and energy and fuel systems synthesis and design. Benefits analysis performs prospective and retrospective analysis of benefits stemming from program investments in fossil fuel-based technologies. Situational analysis collects data and assesses current and long-term trends within the energy industry that may impact energy production and use.

The **Project Management Center (PMC)** harnesses expertise and talent for non-fossil energy research, development, and demonstration projects, including those with other federal organizations such as the Office of Energy Assurance, the Department of Homeland Security, and the Office of Energy Efficiency and Renewable Energy. PMC performs overall management and implementation of these customers' advanced initiatives, providing technical expertise, analytical tools, and a full suite of implementation skills.



The **Office of Research and Development (ORD)** performs basic and applied research and development in fossil energy and environmental science. Building on historic laboratory strengths and competencies, ORD focuses on four research topics recognized as important issues for the 21st century:

- Energy system dynamics focuses on natural gas technology development, including higher efficiencies and lower costs in the use of advanced gas turbines and fuel cells.
- Geological and environmental systems focuses on the minimization and abatement of environmental problems associated with the use of fossil fuels. Research topics include geological sequestration of carbon dioxide, oil and gas exploration and production, air pollution/particulate matter issues, and removal of toxins from emissions from coal utilization systems.
- Computational and basic sciences develops tools that enable more rapid and efficient scaling-up of new sub-systems, devices, and components to commercial-scale.
- Materials science specializes in the life cycle research of metals, alloys, and ceramics and the recycling and remediation of waste streams associated with these processes.

The **Office of Institutional and Business Operations** (OIBO) plans, directs, and coordinates administrative, operational, construction, and staff support activities for the laboratory, including organization and human resource management; the laboratory's chief financial officer (CFO) function; budgetary and financial analyses and administration; information technology management, maintenance and implementation; onsite ES&H program execution, compliance, and remediation activities; acquisition and assistance services; site management, including design, construction, operation, and maintenance of NETL facilities; an internal control program; security services; real and personal property management; and administration of the non-primary site support contracts. Particular functional and technical specialists participate individually or on teams to ensure timely information exchange, to coordinate responses to action items affecting FE and DOE crosscutting functional issues, and to provide support to specific functional offices within Headquarters.

2.2 NETL Timeline

Over the past century, fossil energy research and technology development has been advanced by NETL and its predecessor facilities as the energy needs of the Nation have grown and evolved.

1910 - The newly created Bureau of Mines in the U.S. Department of the Interior (DOI) opens the **Pittsburgh Experiment Station** in Bruceton, Pennsylvania, 12 miles south of Pittsburgh. The station includes an experimental coal mine and offers advanced training for coal operators and miners. Onsite research focuses on developing innovative coal-mining safety equipment and practices.

1918 - Following new discoveries of oil in Oklahoma and Texas, the **Petroleum Experiment Station** was established in Bartlesville, Oklahoma, as one of 17 DOI Bureau of Mines facilities under Public Law 283 (63rd Congress, 1915). The station pursued systematic application of engineering and scientific methods to oil drilling, helping the early “boom and bust” oil industry create operating and safety standards.

1936 – With the enactment of the Emergency Relief Appropriation Act of 1935, the Works Progress Administration erects new station facilities and research activity expands. The Bartlesville Station evolved from a field demonstration center to a research laboratory with its own scholarly publications and achievement record. By the end of World War II, the station had specialized expertise in oil field engineering studies, thermodynamics of petroleum compounds, and characterization of fuels and products.

1946 – World War II sparks national interest in synthetic fuels production, leading to the Synthetic Liquid Fuels Act of 1944. Under the Act, the Synthesis Gas Branch Experiment Station begins government-sponsored coal-gasification research at West Virginia University in Morgantown, West Virginia. Administered by the DOI Bureau of Mines, the 17-employee station is charged with developing processes to produce synthesis gas from coal.



1948 – The Synthetic Liquid Fuels Act (1944) authorizes the creation of energy research laboratories, resulting in the establishment of the Bruceton Research Center near Pittsburgh, Pennsylvania. More than 300 coal scientists work in the center’s newly created laboratories and pilot plants.

1954 – The Appalachian Experiment Station for onsite coal research starts up at the current Morgantown location. The station is created by consolidation of three DOI groups: the WVU Synthesis Gas Branch Experiment Station; a petroleum and natural gas recovery research group located in Franklin, Pennsylvania since 1942; and a safety inspections group, located in Fairmont, West Virginia since 1946. Morgantown staff now consists of 109 employees.

1975 - The new U.S. Energy Research and Development Administration incorporated the former DOI sites as the Bartlesville Energy Research Center, the Morgantown Energy Research Center, and the Pittsburgh Energy Research Center. The centers begin overseeing federally funded contracts for fossil energy research and development. Research areas include development of advanced methods for cleaning coal and combustion gases, alternative methods to



substitute coal for imported oil, and enhanced oil recovery to produce more domestic oil.

1977 – Under the newly established U.S. Department of Energy (DOE), the three sites were renamed as the Bartlesville Energy Technology Center (BETC), the Morgantown Energy Technology Center (METC), and the Pittsburgh Energy Technology Center (PETC). The centers' responsibilities grew to include onsite research in coal, oil, and gas technologies, as well as management of millions of dollars in contracts for research and development conducted by universities, industry, and other research institutions.

1983 – Under a cooperative agreement, the National Institute for Petroleum and Energy Research (NIPER) was founded when DOE transferred operation of the Bartlesville research facility to IIT Research Institute, a private organization based in Chicago. At the same time, DOE established the Bartlesville Project Office to oversee NIPER's petroleum research activities.

1993 - DOE selects BDM-Oklahoma, Inc. (BDM), under a management and operations (M&O) contract to take over operation of the Bartlesville facility and to oversee a national field demonstration effort. BDM focused its efforts on exploration and drilling, reservoir characterization and assessment, and improved recovery methods. The University of Tulsa wins a 5-year contract as principal subcontractor to BDM to carry out an aggressive technology-transfer program focused on independent producers.

1996 - The Federal Energy Technology Center (FETC) is launched through the unification of METC (Morgantown) and PETC (Pittsburgh). Although the sites are 65 miles apart, communications technology makes a seamless organization feasible. FETC strengthens existing partnerships with industry, academia, and other government organizations and forges new ones, reinforcing its role as a catalyst for moving advanced energy and environmental technologies into the marketplace.

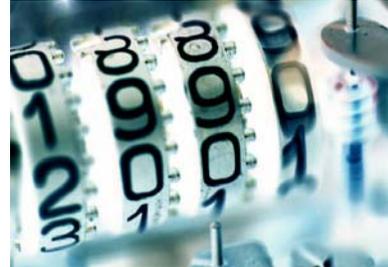
1998 - To align more strategically with national energy objectives, DOE opens the National Petroleum Technology Office (NPTO) in Tulsa, Oklahoma, and closes the Bartlesville Project Office. NPTO shares facilities with DOE's Southwestern Power Administration. The transition strengthens NPTO's contacts with oil and service companies in Tulsa and helps promote the development of technology needed to sustain a vital energy industry.

1999 – The Secretary of Energy designates FETC as DOE's 15th national laboratory, the National Energy Technology Laboratory (NETL), signaling the importance of fossil fuels to the global energy economy. The secretary also creates the Strategic Center for Natural Gas at NETL.

2000 – NPTO joins NETL, elevating DOE's petroleum research program to national status and streamlining the process of technology development to benefit the Nation's

domestic producers. Coordination between the petroleum technology program and the laboratory structure strengthens collaboration and technology exchange between oil exploration and production efforts in Tulsa and natural gas research in Morgantown and Pittsburgh. Combined, the sites employ more than 1,100 Federal employees.

2001 - Following the transfer of the NIPER site to the Bartlesville Development Corporation in 2000, DOE transfers the NIPER property to the City of Bartlesville. The Bartlesville Development Corporation markets the facility to outside businesses as part of local economic development efforts. The Delaware Indian Tribal Headquarters sets up offices at the site.



2001 - NETL opens the Arctic Energy Office in Fairbanks, Alaska, with a two-part mission to promote research, development, and deployment of: 1) oil recovery, gas-to-liquids, and natural gas production and transportation and 2) electric power in arctic climates, including fossil, wind, geothermal, fuel cell, and small hydroelectric facilities.

2005 - The Albany Research Center (ARC) in Albany, Oregon, is realigned by DOE and incorporated under NETL management. With over 50 years of materials engineering expertise specializing in life cycle research, ARC investigates new materials to solve the energy system challenges of today and tomorrow.

2.3 Discussion of Sites within the Document

Four principal sites and one satellite office, AEO, constitute NETL. Each office is located in a different state, is subject to different state and local laws, and focuses on different activities. Because most members of the public are interested in learning about only one site – the site located nearest them – this document splits the detailed discussion among the sites. The Albany, Morgantown, and Pittsburgh sites are laboratories that have a broad array of environmental concerns, so a detailed discussion is provided for each below. Tulsa and the Alaska satellite office serve solely administrative functions, so less is required to be said about their environmental impacts and regulatory compliance activities.

2.4 Awards and Environmental Stewardship Recognition



NETL's mission is to conduct and implement wide-ranging research and technology development programs to ensure the fossil fuels industry can meet America's increasing demand for affordable domestic energy. Across 47 states and more than 40 foreign countries, NETL implements over 1,400 contracted and on-site research and development activities. For this effort, NETL receives numerous awards and

considerable recognition. A summary of many of the awards and recognition received may be found in the National Energy Technology Laboratory Accomplishments Report for FY 2005. The following is a brief sampling of the awards and environmental stewardship recognition received by NETL in 2005.

NETL-Albany Achieves ISO 14001 Certification -- The Albany Research Center was certified to the ISO 14001:1996 standard on November 30, 2005. The Center had been ready to be assessed against the more current 2004 standard at the time of certification, but was informed that the infrastructure for auditing against the more current standard was not yet fully in place.

NETL Wins ESS&H Award—The Office of Fossil Energy awarded NETL one of two 2005 Excellence in Environment, Security, Safety, and Health Awards for its implementation of a unique air sparge-bioremediation system near Gillette, WY. The system incorporates manifolds that direct contaminant-free air to selected monitoring wells to volatilize organic contaminants and increase the dissolved oxygen in the groundwater. As a result, contaminant reduction met state remediation standards in less than 5 years. A conventional pump-and-treat system would have taken as long as 50 years to accomplish the same objective.

Multi-Pollutant-Control Project Attracts Attention—We Energies was recognized with an Award of Excellence for the environmental benefits offered by the TOXECON™ technology and the favorable economic impact of construction-related activities on Michigan's Upper Peninsula. In a cooperative agreement with NETL, We Energies conducted a full-scale test of the TOXECON™ technology at the Presque Isle Power Plant in Marquette, MI. The honor was bestowed at the annual meeting of Operation Action UP, an organization of private sector leaders dedicated to the economic development of the once-depressed 15-county region. TOXECON™ is a patented sorbent-based technology developed by the Electric Power Research Institute as a low-cost retrofit option to achieve high levels (up to 90 percent) of mercury control at coal-fired power plants.

Four Products Earn 2005 R&D 100 Awards—Four technologies developed with support from NETL were selected by an independent judging panel and the editors of R&D Magazine as among the 100 most technologically significant products introduced into the marketplace in 2004 and 2005. Recognized by industry, government, and academia as proof that a company has commercialized one of the most innovative ideas of the year, an R&D 100 Award provides an important boost to technologies just entering the marketplace.

NETL Technology Transfer Achievements Recognized—The Federal Laboratory Consortium presented 2004 Technology Recognition and 2005 Excellence in Technology Transfer Awards to NETL onsite researchers. Both awards recognize outstanding achievement in transferring a new technology from a Federal laboratory to the commercial marketplace.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

3.1 Introduction to NETL's EMS

NETL-Pittsburgh and NETL-Morgantown have implemented an EMS based on the ISO 14001 standard and were independently certified in 2005 to be in full compliance with the ISO 14001 standard. NETL-Albany received certification on November 30, 2005, while working under the Albany Management System (AMS), which is NETL-Albany's EMS-compliant system. NETL-Pittsburgh and NETL-Morgantown received certification on August 31, 2003 and maintained that certification throughout 2004 and 2005. NETL-Tulsa and NETL-Fairbanks are not required to have an EMS, because these two operations are not a "facility" as defined by EO 13148 and are strictly limited to desktop operations that do not impact environmental programs.

NETL maintained ISO 14001 certification for its Morgantown and Pittsburgh sites throughout 2005 from NSF International Strategic Registrations, Ltd., well ahead of the DOE goal to have an EMS in place before December 31, 2005. ISO 14001 certification is maintained through Orion Registrar, Inc. at NETL-Albany. To maintain certification, surveillance audits are conducted every 6 months to measure continual improvement to the EMS and adherence to the ISO 14001 standard. By maintaining ISO 14001 certification, NETL demonstrates to its workforce, the surrounding community, DOE, and other stakeholders that NETL takes its responsibilities for environmental stewardship seriously.

NETL's EMS assures consideration of environmental impacts of day-to-day activities and minimizes these impacts as much as possible, consistent with NETL's mission of fossil energy R&D. NETL's EMS, as described in NETL Order 450.1, Environmental Management System, includes a policy statement, top-down responsibility, personal accountability for work being performed, regulatory awareness, document control, goals, self assessments, and continuous improvement activities.

The scope of the AMS for the Albany site covers research activities for making our Nation's energy systems safe, efficient, and secure. Information about customer and stakeholder needs are translated into requirements for NETL-Albany's research, ensuring that resources and controls for performing research are in place, that the highest quality goods and services are delivered, and that payment for the delivered products is obtained using processes in the AMS. The AMS also addresses the requirements of controlling the impact of NETL-Albany's operations on the environment, on the health and safety of the Center's employees, and on the local community.

The scope of the EMS for the Pittsburgh and Morgantown sites covers onsite operations involving NETL employees at the Morgantown and Pittsburgh sites, including onsite R&D activities, site operations, and the supporting administrative functions related to these activities and operations. Operations not owned or



controlled by NETL are excluded from the EMS, such as the credit unions, childcare facilities, and the Navy tower operations.

The underlying framework of NETL's EMS is DOE's Integrated Safety Management (ISM) system, whereby ES&H accountability is integrated into individual decisions and corporate planning processes. ISM provides for a "plan, do, check, act" approach to maximizing safety of the workforce and the public. NETL's EMS uses the same philosophy to protect the environment, both onsite and offsite, during the conduct of NETL operations and projects over which NETL has control.

3.2 Environmental Policy

Senior management created an environmental policy to communicate to the workforce, the public, and others the guiding principles to use when addressing environmental issues. NETL strives to reduce injuries to the workforce and to minimize hazards to the public and the environment and requires consideration of potential environmental impacts when planning and executing work at all levels. The environmental policy was updated and approved by senior management in 2005 to align the policy with the new 2004 version of the ISO 14001 standard.

Management commitment and employee involvement are required to minimize oversight and improve communication; however, responsibility for effective environmental performance rests with line management. Line management must involve workers in the planning and execution of environmental programs and must fully communicate information to workers and others.

NETL-Albany created the AMS, which is an integrated management system. This means that rather than having separate systems to meet the requirements of safety, the environment, or any other system requested by its stakeholders, there is a single system that incorporates all requirements. The results of such a system are that meeting these requirements are made a normal part of conducting operations, rather than simply added tasks.

NETL-Pittsburgh and NETL-Morgantown use the acronym PRISM to illustrate its policy (see Figure 3.2). PRISM also shows the successful incorporation of DOE's ISM into the ISO 14001 standards. The PRISM graphic is displayed widely at the sites as a reminder to employees and visitors of the NETL policy.



Figure 3.2 Illustration of NETL Environmental Policy

3.3 Identification of Environmental Aspects and Impacts

Determination of NETL-Pittsburgh and NETL-Morgantown environmental aspects requires input from a wide range of sources – onsite researchers, site operations personnel, and ES&H staff. Environmental aspects are impacts over which NETL has control or influence. All NETL research projects, operations, and facilities have been inventoried and scored based on their potential for impacting the environment, natural resources, and environmental laws and regulations.

The significant impact scoring matrix systematically inventories and scores each project, operation, and facility. The scores are reviewed by the EMS Crosscutting Team – a group of ES&H professionals and administrators consisting of both DOE and contractor staff – to determine the most significant aspects of NETL’s activities. The team then recommends to the EMS Representative which aspects should be considered for future improvement.

The relative ranking of aspects is updated annually by the EMS Crosscutting Team and the Registry of Significant Environmental Aspects is published. The 2005 registry (see [Table 3.3](#)) provides a listing of the significant environmental aspects. The 2006 registry was published on November 17, 2005, and includes a report on the analysis used to select the top 10 aspects in 2005. This registry applies to the development of goals, plans, and actions for 2006.

3.4 Environmental Objectives and Targets

Following the annual update and ranking of the significant environmental aspects of NETL’s activities, NETL-Pittsburgh and NETL-Morgantown revised their environmental objectives and targets for the following year and gained approval from the Management Review Team on January 21, 2005, for these revised objectives and targets.

Environmental objectives are goals that an organization attempts to achieve. Environmental targets are specific measurable or quantifiable criteria which support the objective. Performance measures are compared to targets to determine the degree of success in reaching an associated objective. Before establishing and reviewing its objectives, NETL considers regulatory and DOE requirements; technological options; financial, operational, and business requirements; and the views of interested parties.

NETL's EMS Representative assigns responsibility for the objectives and targets to various individuals with expertise in the respective subject area. These individuals develop environmental management plans (EMPs) that specify how NETL plans to attain the objectives. The approved objectives and targets based on the top ten aspects for 2005 appear in [Table 3.4](#).

NETL-Albany has provided for its environmental objectives and targets through EMPs, including the Alternative Fuels for Lift Trucks Program; the Beryllium Identification and Remediation Energy Efficiency Program; the Exterior Buildings Lead-Based Paint Abatement Program; the Groundwater Program; the Particulate Emissions Reduction Program; and the Chemical Inventory Program.

3.5 Environmental Planning and Analysis Procedures

NETL takes a tandem approach to planning and managing its activities in an effort to minimize environmental impacts. Some activities require continuous control for the foreseeable future, while others can be completed in a single effort. Those activities requiring continuous control are managed through NETL ES&H programs. Other activities that represent a concentrated effort are managed through EMPs.



ES&H Directives. Most activities that can impact the environment are routine and occur repeatedly during ongoing operations. One example would be the recovery and use of ozone-depleting refrigerants from appliances when the appliance undergoes maintenance. Because these activities are not one-time events, they are best managed through programs that are documented

in directives (orders, operating plans, and procedures). These documents are written for to describe how routine actions are undertaken to achieve the safety and environmental goals of NETL. Managerial responsibilities are attached to EMS/ES&H function titles. NETL's directives establish the foundation and control mechanisms of the NETL EMS. The directives process is detailed in Procedure 251.1-1, Directives Management System.

Environmental Management Plans. Some activities that can impact the environment can be addressed through a concentrated effort that directly affect objectives and targets associated with NETL's significant environmental aspects. An example

would be replacing chillers that use ozone-depleting refrigerants with chillers that use non-ozone-depleting refrigerants. NETL's short-term EMPs are developed and implemented to achieve near-term objectives and targets. The specifics of the process and elements of an EMP are explained in NETL Procedure 450.1-6, Environmental Aspects, Objectives, Targets, Management Plans, and Management Review. Each EMP specifies the nature of the action to be taken, the timeframe for the action, the responsible person(s) for the action, quantifiable targets, and how performance should be measured against these targets. Quarterly status reports are collected for EMPs to show progress on the activities documented in the plans.

3.6 Implementation and Operational Controls

NETL's EMS is implemented through an organizational structure shown in Figure 3.6.1. Senior level positions include the Director, who serves as the ultimate authority for the EMS and as a lead member of the Management Review Team; the Director of the Office of Institutional and Business Operations, who is the Environmental Steward and Champion; and the Division Director for ES&H, who functions as the program administrator and the EMS Representative. Mid-level titles and responsibilities are defined in several NETL directives that specify key components of the EMS. The ES&H Division Director assigns employees to the function titles and responsibilities.

At NETL-Albany, a major environmental initiative was in chemical inventory. During the week of July 11-15, 2005, NETL-Albany conducted a center-wide stand down. The objective of the stand down was to minimize safety, health, and environmental risks associated with chemical use and storage. The effort focused on ensuring that all chemicals, research products, and commercial products used in performing research and/or maintaining the center were properly labeled, inventoried, and stored. In addition to the full participation of NETL-Albany staff, NETL-Morgantown provided NETL-Albany additional contractor support with expertise in chemical hazards, disposal, and inventory.

The following metrics were identified to measure the success of the stand down: 1) 100% of the center's space would be audited; that is, 100% of the square footage that is available and useable as storage for chemicals and/or materials would be physically checked; 2) reconciliation of the inventory list of all chemicals on the center with the actual findings; and 3) training on chemical handling safety and on the NETL-Albany Beryllium Policy and area usage would be required for all employees.

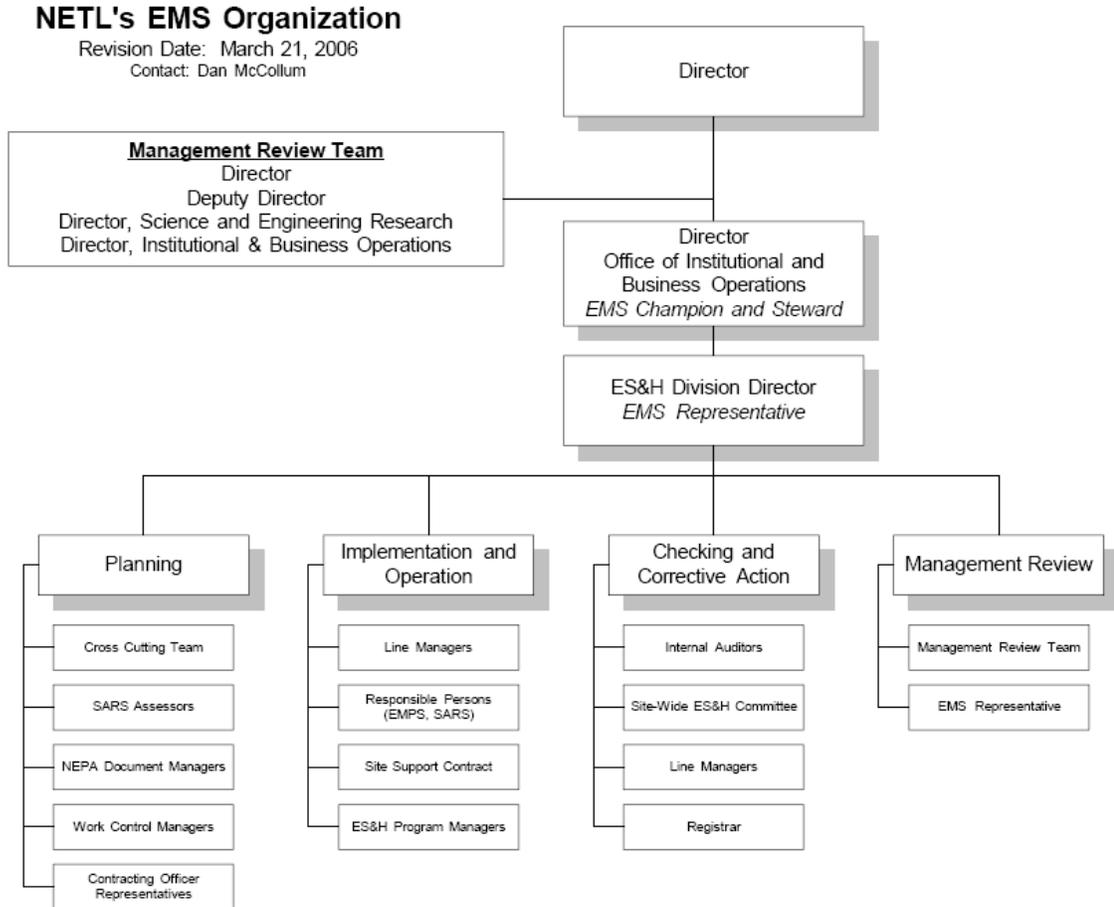


Figure 3.6.1 NETL's EMS Organization

During the stand down, NETL-Albany staff made considerable progress in reducing the quantities of EO13148 priority toxic materials. Of special note is that NETL-Albany's remaining stock of cadmium is negligible, and only a few items containing ozone-depleting substances were found, both evidence of the success of previous efforts. Hazardous chemicals such as beryllium (mainly in inert forms or ores), arsenic, and low level radioactive materials (largely thallium and uranium compounds and ores) were removed for disposal. Only a few minor items containing asbestos were collected, again attesting to the success of previous efforts.

NETL-Albany conducted courses on chemical handling safety (10 CFR 1910.120), beryllium awareness, and a review and discussion of NETL-Albany's beryllium policy (ARC-PO-500.4). Nearly a week was spent reviewing the contents of every drawer and shelf in every room categorized as being an unrestricted area and then labeling, storing, or disposing of the contents as appropriate. A total of more than 3000 person/hours were spent on this exercise in which more than 2600 items were identified and collected for disposal.



Changes to NETL-Albany's chemical inventory were completed, research products with no additional utility were removed for recycling or disposal, as appropriate, and useful commercial products were consolidated. All of this was done with no lost man-hours due to injury or illness.

A high level of internal communication is necessary to successfully implement any program. NETL's system of line management responsibility requires that line managers communicate effectively with the people working for them. Line managers are NETL's chief means of operational control.

EMS communication also occurs through the NETL Intranet, a secure internal website containing current versions of all NETL directives, as well as general reference information, forms, and programmatic information. On the EMS webpage there is an EMS Roadmap that provides an overview of available information.

Another example of NETL's internal communication is the bi-weekly regulatory review, which promotes awareness of regulatory changes and new programs. Every two weeks, an employee reviews federal and state agency websites while searching for announcements of changes in environmental laws, regulations, guidance documents, compliance information, and regulatory agency programs. The search also includes a DOE Headquarters website to check for new DOE requirements and guidance. These reviews are circulated to the ES&H staff, and they are posted on the NETL Intranet Post-It Board for all NETL-Morgantown and NETL-Pittsburgh employees to see.

NETL communicates the EMS to its employees through the intranet, training, staff meetings, email, and posters. The NETL training program includes general EMS training designed to make employees aware of the EMS by providing them with information regarding NETL's significant environmental aspects and the potential impacts of their work, employee roles and responsibilities, and potential consequences of a departure from the specified operating procedures. In addition to the general training, program- and job-specific training is required for all staff based on their specific job duties. The NETL Computer-Based Training (CBT) system includes an evaluation that asks the user about their work assignments to obtain information regarding which training modules or types of training are needed. Job-specific training can also be requested directly by an employee or line manager. Every employee and their line manager is responsible for ensuring that all required training is complete before beginning work on an assignment.

NETL-Albany made significant improvements in electronic information dissemination. The most notable changes were: 1) Implementing a common interface for handling employee training and chemical inventory databases (Compliance Suite) which can be expanded to meet other system needs. Any employee can easily check the databases from a desktop application to see what training has been completed, is required, or is scheduled, or what chemicals are assigned to that individual. This makes it easier for employees to meet their job requirements and for managers to quickly evaluate developmental needs and determine the job and environmental hazards faced by any employee or for the center

and community as a whole; and 2) Establishing electronic delivery of both standard operating procedures (SOP) and material safety data sheets (MSDS) which previously had been kept as hard copies in binders. By providing electronic delivery of this information, the efforts needed to maintain currency were dramatically reduced, and employees could more quickly find the information they needed.

In 2005, NETL continued to refine its newly-integrated CBT system. Upgrades to the software were completed, and training modules were updated and deployed according to a prescribed schedule.

For purposes of communication with external parties, NETL maintains an internet site – www.netl.doe.gov – that has EMS information available to the public, such as the EMS policy and significant environmental aspects.

NETL conducts public participation activities under the National Environmental Policy Act (NEPA) program. For projects conducted offsite, NETL is required by law to use the NEPA process to identify potential environmental impacts, choose among alternatives that are available to NETL, invite public comment or participation, plan the project with due regard for the environment, impose mitigation requirements, and make informed decisions about whether to proceed with the proposed project. The NEPA process provides a system for reviewing actions prior to a major expenditure of funds to ensure the environmental and social impacts have been identified, analyzed, and will be mitigated to the extent practicable prior to committing to the project.

To effectively and efficiently implement the EMS, NETL has to maintain operational control of its onsite R&D projects, facilities, and operations. At NETL-Pittsburgh and NETL-Morgantown this is accomplished through the Safety Analysis and Review System (SARS). NETL-Albany's current process requires a job hazard assessment (JHA) with many of the same items covered as the SARS. NETL-Albany will transition into using a joint JHA/SARS process in FY07. The process requires proposed projects to be described in writing and subjected to ES&H and quality reviews by various subject-matter experts and technical committees. Approval must be granted before a project, operation, or facility modification can proceed beyond the planning stage. Included within this process is a review of the potential environmental impacts, regulatory requirements, safety and health hazards, and monitoring plans. After a project begins, annual reviews are required to make sure the project is within the bounds and constraints that were previously imposed. If the project requires changes, the SARS package must be modified, and the SARS review is repeated. Other processes for operational control implemented at NETL include the following:

- Environmental Programs. Baseline programs have been established for both defined media (air, surface water, and groundwater) and likely pollution routes (spills, hazardous waste, non-hazardous waste). Each program is explained by a NETL procedure and is managed by a NETL program manager at each site.

- Emergency Response System. NETL maintains processes to respond to accidents

and emergency situations and for preventing or mitigating the environmental impacts that may occur. The Emergency Response Organization (ERO) conducts emergency response exercises annually and participates in emergency preparedness training. In 2005, NETL conducted one emergency response exercise at the



Morgantown site involving a confined space entry rescue and one at the Pittsburgh site involving a ruptured mixed acid tank. In addition, two table-top drills and other training for the ERO were conducted. Following a review of the exercises and drills, corrective actions may be undertaken to continually improve the response capabilities. In 2005, the certification processes for ERO positions was updated.

- Contract Requirements. Work performed by contractors is controlled at the NETL sites through procedures that define the ES&H requirements for work on NETL property as well as for NETL-funded work at offsite locations.
- Affirmative Procurement Program. For procurement of goods at the NETL sites, a program has been established to require the purchasing of certain goods having recycled content, as outlined in NETL Procedure 541.2-1, Affirmative Procurement Program.

An integral part of operational control is documentation. Critical documents are controlled according to a defined process to ensure they can be located; they are periodically reviewed and revised; current versions are readily available; and obsolete documents are promptly disposed. The intranet is used as the tool by which up-to-date, approved, and official EMS documentation is provided to the NETL population.

Core EMS documentation is embodied primarily within NETL's ES&H directives. According to procedure, the most recent and official controlled hard copy versions of NETL directives reside with NETL's Directives Coordinator. Electronic versions of these controlled directives are placed on the intranet for employee use and are considered to be the official versions. Official copies of ancillary tables, lists, and forms are also maintained on the intranet and are reviewed and updated as required.

3.7 Self-Assessment Procedures and Corrective Action

NETL uses self-assessment procedures to improve ES&H performance through identification of non-conformances and tracking of corrective and preventive actions. Responsibility and authority for handling and investigating non-conformances and for

initiating and completing corrective and preventive actions has been clearly defined by NETL as part of its processes. Several practices are employed including internal audits, reviews, and inspections; independent assessments; and reporting through NETL's Assessment Information Input System (AIIS) database.

NETL conducts both internal and external audits of its EMS as required by the ISO 14001 standard. This process is defined in NETL Procedure 450.4-14, EMS Auditing. To maintain the ISO 14001 certification, an annual schedule is prepared that ensures the audit of NETL's EMS against the entire standard. There were five EMS audits performed in 2005, including two surveillance audits by the ISO registrar, and three internal audits. The surveillance audits are conducted semi-annually by an external registrar, and the internal audits are conducted by trained NETL internal auditors.

Management's commitment to ES&H is evidenced by participation in monthly management ES&H walkthroughs. DOE and contractor managers, ES&H staff, facility operations staff, and union representatives participate in the walkthroughs, which cover all NETL facilities annually. Walkthroughs focus on readily-observable conditions of NETL facilities (e.g., compliance with OSHA regulations, National Fire Protection Association (NFPA) codes, the National Electric Code (NEC)), and other environmental requirements). The status of corrective actions resulting from the walkthroughs is provided to senior management quarterly.

Annual SARS assessments are performed on new or modified R&D projects, facilities, and support operations. In addition, annual assessments are performed to ensure continued ES&H compliance. A full discussion of the SARS assessment process can be found in Section 3.9, Quality Assurance.

Program reviews are conducted annually by the responsible program managers for each major environmental program (e.g., the Water Quality Program, the Air Quality Program, and the Groundwater Program). These reviews are informal and may vary in scope and detail. During each review, managers attempt to verify that the requirements stated in the procedure are still relevant and are actually being met. When discrepancies are found, the program manager must decide whether to remove a specific requirement from the directive or to enforce the requirement. Some programmatic reviews occur more frequently or focus on monitoring results. These reviews look for trends, with the goal of identifying correctable problems and promptly taking action.

Site support contractor employees inspect various high-risk items periodically, document their findings, and provide the results to program managers. For example, daily inspections are performed at the hazardous waste facility and at selected potential spill sources. Weekly inspections are made of the storm water outfalls and industrial wastewater discharge points. Quarterly discharge monitoring reports are compiled and reviewed to see if any of the permit limits have been exceeded. Likewise, semi-annual surface water monitoring reports are compiled and reviewed. All of this information provides the program managers with an opportunity to assess the effectiveness of their programs.

Meaningful reviews for environmental compliance can occur only if the program managers remain abreast of the changing laws and regulations and any changed DOE administrative requirements. NETL supports several means of maintaining current awareness of the applicable regulations and laws:

- A bi-weekly regulatory review, generated at NETL, provides updates to the program managers that cover the major changes in laws and regulations, as posted on the websites of selected governmental agencies and as posted by DOE Headquarters (EH-41).
- Private sector publications are received by program managers such as “Environmental Compliance in West Virginia,” a quarterly regulatory update bulletin published by Business and Legal Reports, Inc.; environmental compliance updates on CD ROM, published by the Bureau of National Affairs; and various trade journals.
- Program managers also draw on the Pennsylvania Bulletin and the Pennsylvania Code, which are produced by the Commonwealth of Pennsylvania, and the Code of Federal Regulations published by the National Archives.
- The NETL library subscribes to relevant regulatory documents.
- Program managers purchase updated lists of hazardous or regulated chemicals as needed.
- All environmental program managers periodically check the websites of regulatory agencies, such as the West Virginia Department of Environmental Protection (WVDEP) and the Pennsylvania Department of Environmental Protection (PADEP).
- NETL-Albany also uses a regulatory review service, RegScan™, to provide for regular review of Federal and State of Oregon regulatory changes to ensure continued compliance with regulatory requirements.
- To develop general awareness of new areas of responsibility, program managers may take training classes on relevant statutes and regulations.

Ultimately, NETL relies on the professionalism and personal responsibility of the program managers, who are the subject matter experts of the ES&H Division, to do whatever is necessary for them to stay abreast of the changing laws and regulations. It is part of the program manager’s general job responsibilities to stay abreast of regulatory issues that may affect NETL’s EMS and to take appropriate actions to implement these requirements.



- Independent Program Assessments. In addition to internal audits, NETL conducts independent assessments of its ES&H programs through an external contractor to identify strengths, weaknesses, deficiencies, and recommendations for improvement. These assessments provide a look at regulatory compliance and assure that non-compliances are discovered and corrected. The contractor

reviews internally- and externally-generated documents associated with the programs and interviews program managers and other involved personnel. The independent assessments cover (1) directives, policies, standards (including ISO 14001), permits, and regulations; (2) organization and administration; (3) staffing and training; (4) communication/dissemination of program information; (5) documentation and reporting; and (6) performance measurement. Programs assessed in 2005 were the Waste Management Program, the R&D Safety Analysis and Review System, and the Hazard Communication Program.

- Waste Management Program. In general, the systems in place with regard to waste management are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, any and all applicable regulations, and the best practices related to management of waste of all types. Additional training is provided when needed for exceptional circumstances. Training records are maintained by the ES&H Training Team. Findings from the last audit were:
 1. Annual hazardous waste audits for the Pittsburgh site were not performed.
 2. Stored radioactive material at Building B-16 in Morgantown was not marked to indicate whether it was in storage or awaiting disposal.
 3. Medical waste manifests were not maintained by medical personnel in Morgantown for three years.
 4. Inventory lists for hazardous waste satellite accumulation areas were not maintained in Morgantown. Note: Morgantown was selected as the representative site for the satellite accumulation areas during this assessment. Thus the Pittsburgh location was not evaluated.

The audit recommended the following:

1. The SSC representative responsible for medical waste disposal should maintain the file copies of medical waste manifests. Archive copies should be filed in the ES&H Records Center.
2. The requirement for the Radiation Safety Officer (RSO) to have procedures in place for disposal of radioactive waste should be reconsidered, given that most radioactive material is not shipped as waste and is handled very infrequently. The RSO must be qualified by knowledge and training to handle radioactive waste as the situation arises.
3. Consider adding language to construction contracts that would encourage the recycling of waste material.
4. Consider linking waste minimization goals to some aspect of operations to more closely reflect the impact of overall site operations. Examples of operational aspects that could impact waste generation are size and types of facilities, personnel hours worked, or total budget. Changes in these parameters could show up in a marked change in the waste production rates unrelated to the 1993 baseline currently used.

- R&D Safety Analysis and Review System. The systems in place with regard to the R&D SARS program are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, any and all applicable regulations, and the best practices related to chemical hazards of all types. Additional training is provided when needed for exceptional circumstances. Training records are maintained by the ES&H Training Team or in the Safety Analysis and Review System (SARS) file for a given project. Findings from the audit were:
 1. The Photocatalytic Conversion of Methane Hydrates Project should have a SARS review done for the duplicate laboratory.

The audit recommended the following:

1. Investigate whether the current protocol encourages over-classifying projects.
 2. Conduct a training needs assessment to determine whether responsible persons actually need more training or if there is some other non-training problem that should be addressed instead.
 3. Consider some method of insuring that all reviewers reach a standard level of competence. A certification program, for example, might be used to insure the proficiency of new reviewers.
- Hazard Communication Program. The systems in place with regard to hazard communication are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, any and all applicable regulations, and the best practices related to chemical hazards of all types. Additional training is provided when needed for exceptional circumstances. Training records are maintained by the ES&H Training Team or in the Safety Analysis and Review System (SARS) file for a given project. Findings from the audit were:
 1. Shipping and receiving operations are not being audited semi-annually.
 2. The Carcinogen Control Procedure was not available on the intranet as an official document.

The audit recommended the following:

1. Institute semi-annual inspections of chemical shipping and receiving operations.
2. Post the Carcinogen Control Procedure on the intranet as an official document.
3. Although there were no findings related to training, it would be easier to determine compliance if there were a defined set of courses that met the training requirements for Department of Transportation HAZMAT personnel.

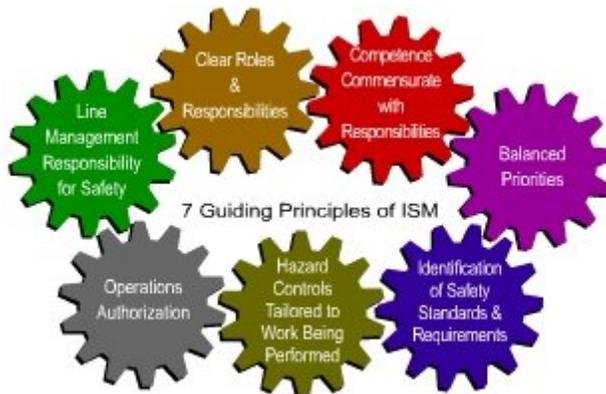
At NETL-Pittsburgh and NETL-Morgantown, non-conformances generated from all

of the self-assessment audits mentioned above are documented using the AIIS database. NETL-Albany provides documentation of assessments and audits within the TrackWise™ software system. The AIIS database is used for recording ES&H assessments and tracking corrective and preventive actions. Corrective action status is measured by data provided by AIIS or TrackWise™. All NETL employees have access to AIIS or TrackWise™, and instructions on the use of the systems have been communicated to everyone.

At NETL-Pittsburgh and NETL-Morgantown, NETL Procedure 450.4-4, ES&H Corrective and Preventive Action Process, outlines how corrective and preventive action items identified in the various assessments performed at NETL are captured, prioritized, assigned, tracked, closed, analyzed for root causes, and incorporated, as appropriate, into the lessons learned and training systems. This process holds responsible persons and their line managers accountable for timely closure of corrective actions implemented within their programs, organizations, or facilities and disseminates lessons learned across appropriate organizational elements at NETL.

In brief, after completion of an assessment, the lead assessor at NETL-Pittsburgh and NETL-Morgantown uses the AIIS database to generate an assessment record, which is identified by a unique number. NETL-Albany utilizes a tracking system, TrackWise™, for recording corrective and preventative actions. Individual findings and concerns that require corrective action are entered into AIIS or TrackWise™ to ensure they are tracked to completion. When a finding or concern is entered into the system, a unique number is assigned and cataloged in the database with the associated assessment record. A notification of the finding is sent electronically to the responsible person and line manager. All actions taken regarding the finding are then documented in AIIS or TrackWise™. Follow-up is done through the internal auditing process to ensure that the findings have been fully addressed.

Other processes used for reporting corrective actions include NETL Procedure 151.1-2, Emergency Categorizations, Classifications, and Notifications, which is used to catalog and investigate major non-conformances as required by DOE, and NETL Procedure 231.1-2, Injury/Illness Investigation and Reporting, which sets forth the minimum requirements for injury or illness and property damage investigation and reporting for NETL.



3.8 Quality Assurance

Please see [Section 4.1.3](#) for a description of NETL's Quality Assurance (QA) Program, including QA for the EMS and AMS.

3.9 Management Review Process

Management review of NETL's EMS ensures that the policy and system remain appropriate and effective. NETL's EMS Representative/QA Manager conducts semi-annual review meetings with the Management Review Team (see [Figure 3.6.1, NETL's EMS Organization](#)). During the review meetings, the Management Review Team considers the environmental policy, objectives, targets, internal and external audits, and other related issues. Changes are documented and implemented. Management involvement guarantees that the projects are funded and the appropriate priority is placed on the issues that are identified. Notes from the MRTs are posted to the intranet.

In 2005, two management review team meetings were conducted on January 21, 2005, and September 23, 2005. During the January meeting, the MRT approved the 2005 objectives and targets, agreed to the reduction in internal audits from four to three based on successful internal audits over the past years, and requested changes to the AIIS be made to make it more user friendly. These actions were completed.

During the September 23 meeting, the MRT requested that training be provided to employees prior to the ISO 14001 recertification audit, directed the Director of OIBO to ensure that the Facility SARS process was being after internal audits found significant problems in this process, and generally demonstrated their continued support for the EMS.

4.0 COMPLIANCE SUMMARY

4.1 Major Environmental Statutes

NETL was in full compliance with all environmental statutes and regulations throughout 2005. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those statutes included CERCLA, SARA, RCRA, CAA, CWA, AEA, NEPA, and TSCA, and each are described in detail below.

4.2 Environmental Executive Orders

NETL was in full compliance with all environmental executive orders throughout 2005. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those executive orders included 13148, 13101, 11988, and 11990, and each are described in detail below.

4.3 [DOE Internal Environmental and Radiation Protection Orders](#)

NETL was in full conformance with DOE Order 450.1, which is the single major internal environmental protection order applicable to NETL. NETL does not operate a radiological program of similar scope to the DOE's national laboratories under the

National Nuclear Security Administration's control. However, a limited number of sealed sources were administered in full compliance with DOE Internal Radiation Protection Order 5400.5, as discussed below.

4.4 [Atomic Energy Act of 1954](#)

The Atomic Energy Act (AEA) of 1954 and its amendments require federal control of radiation source materials for the protection of the public and workers. DOE orders, EPA regulations, and Nuclear Regulatory Commission regulations are based on the AEA. To fulfill its obligations, DOE has implemented radiation protection programs at DOE facilities that process, produce, handle, use, or dispose radiation source materials.



NETL's sites in Morgantown and Pittsburgh do not process, produce, or dispose radiation source materials as a part of its routine operations.

Morgantown and Pittsburgh use research instruments that contain sealed radiation sources. Most of these are small quantity emitters used to make various types of measurements. Additionally, the Morgantown site has four phosphorescent exit signs located in the hazardous waste accumulation facility. The radiation

safety officers maintain an inventory of the radiation sources on site, indicating the item, isotope(s), quantity, custodian, location, status, and activity. [Table 4.4.a](#) lists the 2005 source inventory for Morgantown. [Table 4.4.b](#) lists the 2005 radioactive sealed source inventory for Pittsburgh. [Table 4.4.c](#) lists the 2005 X-ray radiation generating devices for Pittsburgh. During 2005, the Morgantown and Pittsburgh sites did not release any of the radiation source materials into the environment. All of the source materials are sealed from escape or discharge. No radiation source materials were sent to offsite storage or disposal facilities. The NETL-Albany site has legacy radiological issues, including ores that are naturally-occurring radioactive materials.

NETL-Albany is currently finalizing a radiation protection plan. Radiation exposure monitoring at the Morgantown, Pittsburgh, and Albany sites consisted of the use of several personal dosimeter badges. In addition, leak testing and analysis was performed on sealed sources at NETL-Morgantown and NETL-Pittsburgh by Applied Health Physics, Inc. Operational radiation sources at NETL-Albany are leak checked by certified personnel employed by Oregon State University.

4.5 Compliance and/or Cleanup Agreements

There were four offsite remediation activities that were part of an ongoing compliance agreement during 2005. All four sites have volatile and semi-volatile compounds in the groundwater and soils. Volatiles present are primarily benzene, toluene, ethylbenzene, and xylene (BTEX) compounds. The semi-volatiles are primarily phenolic compounds. Tests of underground coal gasification and tests of in-situ oil shale retorting resulted in contamination at these sites. They are discussed in detail below.

4.6 Environmental Violations Cited by Regulators

There were no instances involving violations cited by regulators in 2005. On December 12, 2005, the WVDEP Division of Water & Waste Management conducted a surprise inspection, and no areas of non-compliance were found. There was a single notice of violation (NOV) issued for a low pH discharge from the clarifier (discussed below).

4.7 Notices of Violation, Notices of Deficiency, Notices of Intent to Sue, and Other Enforcement Actions Issued.

Certain volatile organic compounds (VOCs) at levels above the State of Oregon's risk-based standards have been found in the groundwater at NETL's Albany site, at Liberty Elementary School located adjacent to the site, and in drinking wells used by nearby local residents. Contaminants of potential concern include trichloroethene (TCE), tetrachloroethene (PCE), carbon tetrachloride, and chloroform. Albany began a groundwater monitoring program as a voluntary effort on site in 2001 and offsite in March 2005.

Given the detection of the VOCs, NETL continues to monitor the groundwater both on and off-site, to sample residential wells, and is a voluntary participant of the Oregon DEQ Cleanup Program. As a result, NETL works closely with the Oregon DEQ, the appropriate regulatory authority, to investigate the nature and extent of the contamination, as well as assess appropriate remediation methods. No enforcement action has been initiated by the DEQ against the DOE.

DOE may have some liability associated with the groundwater contamination at Liberty Elementary School and/or the well contamination at several surrounding residences if the groundwater investigation reveals that NETL is the source of the contamination. The source of the contamination however, remains unknown. The City of Albany tested and certified the drinking water both on-site at NETL and at Liberty Elementary School and certified that it does not contain VOCS above Federal drinking water standards. Further, TCE, the prevalent VOC detected off-site, is a common chemical found in cleaners, degreasers, and paint thinners, the source of which may be from gas stations, dry cleaners, repair shops, or former businesses using such chemicals in the immediate vicinity of the Albany site.

Future plans include the installation of permanent monitoring wells at Liberty Elementary School. Residential well sampling will continue on a semiannual basis until remedial actions are complete or until they are no longer appropriate. Albany will continue to investigate potential sources and confirm the nature and extent of the contamination. Current plans also include the development of a site conceptual model to determine the hydrogeology and water flow pattern(s) both on and off-site at Albany. Once the investigation is complete, NETL will conduct a phased risk assessment and determine and implement the appropriate remedial actions. NETL will continue to cooperate with the Oregon DEQ in conducting these activities.

Beryllium

The Albany site was engaged in a variety of metallurgical and materials research projects and activities, some of which involved beryllium (Be), until the early 1980s. In 2005, beryllium surface contamination above the threshold limits for contamination specified in 10 CFR Part 850 was discovered in several areas of the Albany site. In response, NETL-Albany began a systematic process of identifying all beryllium-contaminated areas and evaluating the potential levels of residual beryllium throughout the site. Albany is testing the facility for the potential spread of beryllium and is currently conducting a beryllium inventory sampling.

To limit potential exposure of its employees to beryllium, the site has restricted access to a number of its facilities and requires protective measures to be taken for individuals requesting access to perform work in these areas. Taking a conservative approach, the site implemented additional worker safety measures, including the provisions of 10 CFR Part 850 for establishing a Chronic Beryllium Disease Prevention Program. Employees were provided with beryllium awareness training in July 2005, and a computer-based training module was provided as annual refresher training.

Once the beryllium inventory is complete, Albany will conduct a hazard assessment to determine the potential risk to employees and conduct a remedial action alternatives study to identify and determine the appropriate remedial action(s) to be taken.

There was a single notice of violation (NOV) issued to NETL-Morgantown related to a discharge of contaminated rainwater from #3 containment pit for the Gas Process Development Unit (GPDU). The water had a low pH from acid contamination of the rainwater in the pit. The Clarifier waste water pretreatment operation that was designed to treat such waste failed to operate properly. As a result, waste water with a pH outside the range acceptable by the waste water permit was discharged, resulting in the NOV being issued by the West Virginia Department of Environmental Protection. NETL-Albany, NETL-Pittsburgh, NETL-Tulsa, and NETL-Fairbanks did not receive any NOVs.

4.8 Reportable Occurrences

NETL filed six occurrence reports in 2005 into the DOE Occurrence Reporting and Processing System (ORPS). One report was for the NOV that was received in Morgantown (discussed above), one was for a fire line break at NETL-Pittsburgh that released turbid water into the nearby waterway, two ORPS were for fire line breaks that created a fire safety class system breach at NETL-Pittsburgh, and two were near-miss reports at NETL-Pittsburgh that did not involve any actual harm, but were reported because there was only a single intervening barrier that prevented the incident from being reported as an actual occurrence.

4.9 Major Issues, Instances of Non-compliance, and Corrective Actions

There were no major issues, instances of non-compliance, or corrective actions at NETL throughout 2005. The minor issues are discussed above in Sections 4.6 and 4.7.

4.10 Status of Ongoing Self-Assessments and/or Environmental Audits

NETL continued to maintain the ISO 14001 certification at NETL-Pittsburgh and NETL-Morgantown throughout 2005 through two external surveillance audits and three internal audits. NETL-Albany achieved ISO 14001 certification in November 2005 after dedicating significant resources throughout 2005 to achieve the certification.

4.11 Existing Permits

A summary of environmental permits for the Morgantown site is provided in [Table 4.1.1.a](#) and for the Pittsburgh site in Table 4.1.1.b. NETL-Albany maintains a wastewater discharge permit with the City of Albany.

4.12 Emergency Preparedness

NETL maintains processes to respond to accidents and emergency situations and for preventing or mitigating the environmental impacts that may occur. The Emergency Response Organization (ERO) conducts emergency response exercises annually and participates in emergency preparedness training. In 2005, NETL conducted one emergency response exercise at the Morgantown site for a confined space entry emergency rescue and one at the Pittsburgh site involving an acid splash and burn to an employee who works in the Chemical Handling Facility. The Morgantown site received a No Notice Exercise from NNSA. Corrective actions from these exercises are resulting in a revision of the Emergency Communications/Public Affairs Plan and how it integrates into emergency response.



4.13 [Quality Assurance](#)

NETL is responsible for a wide range of work activities including basic and applied onsite research; contract administration for offsite research, development, and demonstration projects; design, construction, operation, modification, decommissioning, and environmental remediation of NETL facilities; and the management and oversight functions relating to these activities. NETL's Quality Assurance (QA) Program provides the tools to ensure that this work is accomplished safely while minimizing potential hazards to the public, site workers, and the environ-

ment. The QA Program is based on DOE's ISM principles, ISM core functions, and DOE Order 414.1C -- Quality Assurance.

Line management accountability for ES&H issues is an integral part of the QA Program and ISM. NETL implements this through work performance goals for which all line managers are accountable. Internal assessments and audits also ensure that line managers are accountable for their ES&H responsibilities.

Another principle of ISM is competence commensurate with responsibilities. NETL's ES&H training program provides a process for ensuring that employees get the appropriate ES&H training they need to protect themselves, their coworkers, the public, and the environment.

NETL uses an electronic job hazard survey to identify both general and specific ES&H training courses that employees need. Survey questions focus on potential hazards and responsibilities associated with the various tasks of an individual's job. Training needs are also identified and documented through the SARS process. This training analysis includes defining requirements to show competency, including appropriate education, training, and experience, as well as an understanding of the importance of NETL's environmental aspects for project design and operation, including support operations. ES&H training records are managed through NETL's CBT system, DOE and contractor human resource departments, and official SARS files.

The SARS process is the backbone of NETL's QA Program for ES&H. Much of the needed data regarding hazards and environmental impacts are generated from this process; therefore, it is important that it work effectively. NETL has three distinct SARS processes: one each for R&D, facility, and support operations.

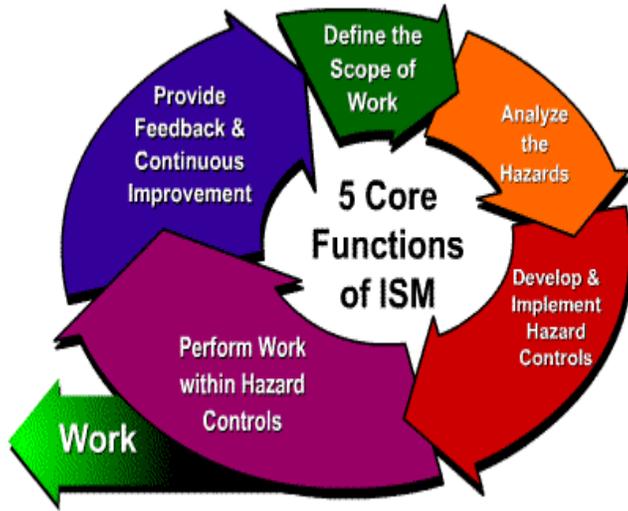
At NETL-Morgantown and NETL-Pittsburgh, the R&D SARS procedure, NETL P 421.1-1, describes the process and procedural requirements for a safety analysis and review of onsite R&D projects. The purpose of this safety analysis and review is to ensure that risks associated with NETL's onsite R&D projects are analyzed, understood, and then eliminated, mitigated, or controlled to a degree acceptable by line management before work begins. All onsite R&D projects receive a SARS operating permit after successful completion of the SARS review. NETL-Albany uses a job hazard assessment (JHA) process and writes standard operating procedures (SOP) for all hazardous tasks on site.

An annual review is conducted on all SARS-permitted R&D projects by a team made up of, at a minimum, the project's responsible person (or designee), an ES&H representative, a project quality assurance engineer (PQAE), and the site's environmental manager. The assessment includes: (1) a check for significant modifications made to the project without appropriate authorization and SARS review; (2) an ES&H Division inspection of the project area covering chemical hygiene, OSHA requirements, and environmental compliance; (3) a review of the SARS files and the project area for engineering design and QA/quality control concerns; and (4) a review of problems found in the project area or in the SARS file. Records from each annual assessment are added to the SARS file.

Findings from the annual assessment are assigned a priority by the assessor or ES&H representative: Priority 1 findings are urgent actions and are required to be corrected within 7 days; priority 2 findings are serious deficiencies and are required to be corrected in 45 days; priority 3 findings are considered non-serious deficiencies and are required to be corrected in 120 days; and priority 4 findings are considered de minimus deficiencies which are to be corrected within one year. After assignment, findings are sent to the responsible person for correction using the AIIS. The responsible person's supervisor is copied on the finding.

NETL's Facility SARS Procedure (NETL P 421.1-3) covers onsite facilities including buildings, trailers, utilities, services, structures, roads, and walkways. The purpose of this safety analysis and review is to ensure that facilities are constructed, maintained, and modified in compliance with applicable codes, regulations, and standards. The Facility SARS Procedure provides for construction permits, which are required prior to new construction or modification of an existing facility, and for use permits, which are required prior to occupancy of a facility or changing the use of a facility.

An annual ES&H assessment is performed of all SARS-permitted facilities by an ES&H assessment team made up of, at a minimum, the facility's custodian and ES&H staff, including the OSHA safety manager, the chemical hygiene officer, the environmental manager, and the life safety officer. Findings are assigned a priority based on significance and recorded in the AIIS database for tracking.



In 2005, the facility SARS procedure was revised to include an idle and decommissioning SARS process for those projects which are no longer operating or are being decommissioned. The changes also address how records should be dispositioned for decommissioned projects.

NETL's Support Operations SARS Procedure, NETL P 421.1-2, covers onsite support operations conducted by site support contractors, such as construction, operations, maintenance, and

renovation activities for which they are responsible, and ensures that associated risks are analyzed and understood and then eliminated, mitigated, or controlled to a degree acceptable by responsible line management prior to potential adverse impacts on workers, the public, the environment, the facilities, or any equipment.

An annual assessment is conducted on all SARS-permitted support operations. The purpose of the annual assessment is to determine the continued validity of the SARS package and to address any changes in the operations. Typical items that might be re-evaluated include changes in site conditions, worker training, operating procedures, and the effectiveness of controls.

In 2005, the support operations SARS procedures were modified to include the role of a site support contractor representative, and a checklist was created to ensure that all appropriate documentation was included in the SARS package.

4.14 Performance Measurement

Goal setting is an excellent approach to motivate and monitor performance. NETL's environmental performance and progress toward goals is tracked and reported to satisfy both internal and external requirements. Measures include EMP objectives and targets (see Section 3.4) and institutional environmental performance measures, including NETL's performance measures in response to the requirements of the Government Performance and Results Act (GPRA) of 1993. The second set of measures is presented in [Table 4.14.a](#), Environmental Performance Measures. A summary of the same environmental performance measures is presented in [Table 4.14.c](#). The measures are tracked on a fiscal year basis. They cover performance goals for FY 2004. In addition to these measures, surveillance monitoring is conducted through routine reviews and inspections. This monitoring is presented as [Table 4.14.b, Surveillance Monitoring](#).

BEGIN SEPARATE SITE ANALYSIS

5.0 MORGANTOWN

5.1 Site Description

The Morgantown site resides within Monongalia County, West Virginia, on the northern end of Morgantown. This location is about 70 miles south of Pittsburgh, Pennsylvania, and about 200 miles west of Washington, DC. Geographically, the facility sits within the rolling hills of the Appalachian Plateau, about 1,000 feet east of the Monongahela River and about 10 miles west of Chestnut Ridge, the westernmost ridge of the Allegheny Mountains. The Morgantown site covers approximately 132 acres, 46 acres of which are developed as an industrial area. Two small streams border the site on the east and northeast sides, and all surface drainage goes into these two streams. Immediately surrounding the Morgantown site, the land use is a combination of residential, commercial, deciduous forest land, and pasture.

The Morgantown site focuses on technologies in coal utilization, natural gas production and utilization, and energy efficiency. This work is accomplished through both in-house R&D and contracted research. There are approximately 600 employees at the Morgantown site, roughly half of whom are Federal and half of whom are site support contractors.

As of the 2000 U. S. Census, Morgantown's population consisted of 26,809 people, 10,782 households, and 4,183 families residing within the city limits. The population density was 1,056.2/km² (2,736.0/mi²). There were 11,721 housing units at an average density of 461.8/km² (1,196.2/mi²). The racial makeup of the city was 89.48% White, 4.15% African American, 0.17% Native American, 4.15% Asian, 0.05% Pacific Islander, 0.51% from other races, and 1.48% from two or more races. The Hispanic or Latino makeup of any race was 1.54% of the population.

The median income for a household in the city was \$20,649, and the median income for a family was \$44,622. Males had a median income of \$33,268 versus \$24,944 for females. The per capita income for the city was \$14,459. About 15.0% of families and 38.4% of the population were below the poverty line, including 23.3% of those under age 18 and 8.3% of those who are age 65 or over. Note, however, that traditional poverty statistics can be misleading when applied to communities with large university student populations, such as Morgantown. The major employers within the Morgantown area are West Virginia University (WVU), WVU Hospitals, Mylan Laboratories, Inc., the Monongalia County Board of Education, the Monongalia Health System, Inc., University Health Associates, the National Institute for Occupational Health and Safety, NETL, and the Health South Rehabilitation Hospital.

5.2 Major Site Activities

Construction of the Technology Support Facility -- The cover of this report shows an artist's depiction of the new Technology Support Facility (TSF) that is being constructed on the Morgantown site. It is being constructed using the most advanced environmental systems and is expected to earn certification as a Platinum Leadership in Energy and Environmental Design (LEED) facility. It will be 4 stories high and contain 106,000 square feet of space, including 168 offices. By incorporating the advanced environmental systems, the facility is expected to realize as much as \$1.5 million in savings per year in operations, maintenance, and utility costs. Environmental systems built into the facility include: a rainwater recirculation and purification system that avoids the need for public water consumption; waterless restroom facilities; advanced on-demand lighting management systems; environmentally friendly green grass planted on the roof for rainwater collection and natural insulation; and recycled materials of construction. The footprint of the facility did not consume any green space because it was constructed over existing parking areas, which were relocated to a newly constructed parking garage. In addition, the new TSF will have a visitor center constructed of glass to allow visitors to observe technology exhibits and demonstrations without entering the more secured portion of the facility.



Facility Repairs Completed – The roofs of Buildings 2, 3, and 8 were replaced or repaired due to the end of their life cycle; courtyard walkways were replaced because the concrete had deteriorated to the point that a tripping hazard was being created; walkway lighting was replaced to enhance safety; the gas-fired steam heating system in Building 5 was replaced with two completely automated, high efficiency gas-fired boilers for providing steam heat to the facility; the deteriorated HVAC ductwork in Building 25 was replaced to resolve an indoor air problem caused by rust in the system; and Building 1 brick re-pointing and repair necessitated by weather damage to veneer brick on the building was completed.

6.0 COMPLIANCE STATUS

6.1 Environmental Restoration and Waste Management.

6.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Morgantown site of NETL had no National Priorities List (NPL) sites in 2005 and has never been proposed as an NPL site. Furthermore, NETL has never been on the Comprehensive Environmental Response, Compensation, and Liability

Information System (CERCLIS) list or the State Hazardous Waste Site list (state equivalent of CERCLIS). There were no reportable releases in 2005.

During the past 25 years, there have been several onsite cleanup activities. Some of these activities followed the closure of facilities that had leaked for a number of years. Other cleanup activities followed discrete spills. [Table 6.1.1](#) provides an overview of these events in terms of the sources, contaminants, and current status of the site. A list of the specific chemicals or materials of concern is presented in [Table 6.1.2, Properties of Potential Contaminants](#).

The most recent release occurred on May 2, 1994, when ethylene glycol (a common automotive antifreeze agent) leaked from a commercial-scale air conditioner chiller for B-1, which is an administrative office building. The release was discovered when a pink color appeared in the wastewater clarifier, which is a unit that provides pretreatment prior to release into the municipal sewer. All the released material had been directed into a drain pipe, so none of the material escaped into the soil or directly into surface water. NETL immediately reported the spill to the National Spill Response Center and to the Morgantown Utility Board (MUB), the operator of the municipal sewer system that received the contaminated wastewater. The leak was repaired and a leak detection system was installed. No regulatory actions or complaints resulted.

6.1.2 SARA Title III

The Emergency Planning and Community Right-To-Know Act (EPCRA) requires facilities that store hazardous materials in quantities exceeding threshold amounts to notify the state emergency response commission, to cooperate in local emergency response planning activities, and to submit hazardous material inventories and MSDS documents to the local and state emergency response and planning organizations. It also requires the reporting to the EPA and designated state officials of annual releases of toxic materials that are used, produced, or processed in quantities exceeding threshold amounts. The inventory requirement is triggered when the facility stores more than 10,000 pounds of a hazardous material (as defined by OSHA) or more than 500 pounds, 55 gallons, or the specific threshold planning quantity of a listed extremely hazardous substance.



To help comply with these regulatory requirements, NETL developed Procedure 440.1-2 (B), *Chemical Inventory and SARA Title III Reporting*, which is implemented by the NETL Federal Chemical Hygiene Officer. The program revolves around a computer-based chemical inventory system that is continually updated as materials are purchased, consumed, or disposed. Annually the database is verified by representative samplings of work areas to determine whether observed types and quantities of materials match the database information. Chemicals arriving on

site must be accompanied by an MSDS, or they will be held at the warehouse until the MSDS is obtained. When a prospective buyer wants a particular chemical, they must first check the intranet-based chemical inventory and the waste accumulation list to see if it is available on site. If not, they may obtain a purchase request for the chemical. The purchase request is reviewed by a specialist who assigns an MSDS number, if an MSDS is already on file. The specialist also attempts to determine if less hazardous substitutes are available. When the purchase request is cleared, the purchase can begin. When chemicals arrive on site, tracking begins. First, the chemicals are tagged and logged into the database. When the chemicals are moved to a new location, the database must be updated with the new location of the materials. When the empty container is picked up or when the remaining material is sent to the hazardous waste facility for disposal, the item is removed from the database.

The Morgantown site provides chemical inventory reports (Tier 2) to the Monongalia County Local Emergency Planning Committee and the Morgantown Fire Department. Hydrogen sulfide is the only chemical present at the Morgantown site in excess of the threshold planning quantity, as defined by SARA Title III. Hydrogen sulfide is stored as a compressed gas in metal cylinders. Other materials that are reported are carbon dioxide (average daily amount stored is approximately 3600 pounds) and nitrogen (average daily amount stored is approximately 7922 pounds). Nitrogen is stored outdoors in an above-ground storage tank and individual gas cylinders.

The Morgantown site does not generate a toxic release inventory (TRI) because the site does not release any of the listed toxic materials in quantities that exceed the TRI threshold amounts. During 2005, there were no releases that would trigger emergency notification as required by either EPCRA or CERCLA.

6.1.3 RCRA Program

RCRA classifies sites as generators, transporters, or TSD facilities. The Morgantown site holds a permit as a large quantity generator and is under the jurisdiction of WVDEP. Although hazardous waste generation rates are low for most months,

occasional lab activities result in the generation of larger quantities that exceed the threshold for large quantity generators. [See Table 6.1.3a](#) for summary information on waste generation and management. NETL does not hold a permit as a transporter or TSD facility for hazardous waste, nor does it hold a permit for treatment or disposal of non-hazardous waste that would be regulated under RCRA Subtitle D. Hazardous waste may be stored on site for no more than 90 days without a permit. During 2005, hazardous waste materials were transported to the storage and treatment facilities of American Environmental Services (AES), Inc., located in Westover, WV, a town adjoining Morgantown. At the AES facility, small packages of similar waste is combined and repackaged for more cost-effective shipment to a final disposal facility selected by AES. Non-hazardous waste (normal office wastes that are not recycled and cafeteria waste) is transported by Browning Ferris Industries (BFI), Inc., to the Meadowfill landfill, located near Clarksburg, WV.

NETL complies with the RCRA manifest requirements by initiating documentation when hazardous wastes are shipped from the Morgantown site. The NETL Hazardous Waste Coordinator initiates the documentation and files copies of the manifests, forms, waste profiles, contracts, and other documents. Ultimately, these documents are sent to the NETL ES&H Records Center.

NETL does not have an onsite program to treat hazardous waste or render them harmless; however, NETL does recycle some semi-hazardous materials (materials classified under RCRA as universal waste). During 2005, NETL recycled batteries, fluorescent light bulbs, and various items containing mercury.



Onsite hazardous waste handling is governed by NETL Procedure 450.1-9, *Waste Handling, Storage, and Disposal*. This procedure requires lab workers to put their own hazardous waste into labeled containers (drums, buckets, bottles) in their labs. NETL provides various types of containers and labels for this purpose. Labels must indicate the contents of the container and the responsible party (producer of the waste). An internal manifest is attached to waste containers for internal tracking and identification. Laboratories have satellite

accumulation areas where the waste awaits transport by technicians to the on-site collection area located in B-33. Technicians who transport the waste on site inspect the waste for proper containment, labels, and completed documentation. They will not move waste that lacks these items. When unlabeled and unidentified materials are found, NETL sends samples to a contracted laboratory to test for RCRA hazardous characteristics (e.g., toxicity, ignitability, reactivity, and corrosiveness).

According to the procedure, the collection occurs each month or as needed. At the collection area, a technician checks the containers for appropriate internal manifests, and the waste may be repackaged into "lab-packs" for purposes of transportation. Wastes are held only temporarily in the collection area until the next pickup by the

contracted transporter. Storage on site is less than 90 days for “non-universal” hazardous waste regulated by RCRA. The hazardous waste coordinator assures proper labeling on the waste at the time of pickup by the contracted transporter.

Despite training and the various administrative controls, including the planning that precedes the issuance of a SARS permit, there is always the possibility that someone may dispose hazardous materials down a sink, toilet, or floor drain. It is a violation of NETL procedures to put hazardous materials into sinks, toilets, floor drains, or regular garbage cans. During annual inspections and during periodic walkthrough inspections, ES&H staff visually checks garbage cans for evidence of improper disposal practices. To check for improper flushing of chemicals, ES&H staff sample wastewater discharges monthly for metals, various organic compounds, pH, BOD, total suspended solids, and TOC. A full suite of chemical analyses are conducted on wastewater annually. If anomalous readings are obtained during the monitoring of the dedicated laboratory wastewater sewer system, troubleshooting begins. If necessary, ES&H staff will sample fixture traps and drains to locate the source of the chemicals. Spill kits are provided in areas where chemicals are handled. Floor drains are connected to the on-site pretreatment facility, where NETL staff may be able to detain and neutralize any spilled chemicals before release offsite.

Morgantown stores its waste indoors within a specially designated area, which requires a key for entry. Extra spill protection is provided by an epoxy coating on the concrete floor, which drains to sump pumps connected to catch containers. The building is constructed with blast abatement and spill containment features to minimize the potential risks of spark-induced ignition and the spread of contaminants in the event of an explosion or leak. Each class of waste is collected into separate rooms to minimize the chance that a leaked material could come into contact with an incompatible substance and cause a reaction. A site support contractor performs daily inspections and keeps records of the results. RCRA-required worker training is mandatory for all technicians who collect and handle hazardous waste. The initial training is supplemented periodically with refresher courses. All NETL employees take general awareness training that is offered through NETL’s CBT software. Those persons who generate hazardous waste in the labs take additional lecture-based training.



There are no hazardous waste ponds or underground storage tanks for any materials at the Morgantown site. These items were phased out in the past, and most contaminated soils associated with these items were removed. Currently, there are aboveground storage tanks holding gasoline, diesel fuel, ethanol, and fuel oil. The tanks holding gasoline are visually inspected weekly for leaks. Quarterly interstitial monitoring is performed on the double-walled tanks. NETL installed most of these tanks during the mid 1990s. Aboveground fuel tanks do not require certifications for the State of West Virginia. At the Morgantown site, there are additional aboveground storage tanks designed to hold acids and bases as lab feeds. For the GPDU, there was

one tank holding sulfuric acid (H₂SO₄) at a 93 percent concentration, and there are two tanks designed to hold sodium hydroxide (NaOH) at 50 percent and 20 percent concentrations. The tanks designed for NaOH storage were never utilized and have been empty since installation. For these tanks, the sump water (which should be only rainwater) in the secondary containment was monitored before discharge. If the pH of the rainwater collected in the sump was outside the normal range, it was discharged to the clarifier for pH control prior to discharge into the municipal sewer system. During 2005 the sulfuric acid tank was emptied in preparation for decommissioning of the GPDU project. Outdoor piping is not automatically monitored, but most pipes are run above ground where leak checks can be performed visually. Acid and base pipes feeding the GPDU run underground and do not have special leak detection devices but are contained within larger PVC pipes which slope back to the secondary containment pits to prevent soil contamination. The clean out of the tanks associated with the GPDU inflated the numbers associated with waste corrosive liquids. This activity was classified as a one time activity, legacy waste, since the project was slated for decommissioning/demolition.

Chemical acquisitions are also controlled. All purchases of chemicals must be approved, and a search is done for existing supplies of the chemicals onsite before a purchase is made. When shipments of chemicals arrive at the warehouse, they are inspected for labels and MSDSs. If MSDSs are not provided in the shipment or otherwise made available, the shipment will be returned to the sender.

To deal with the possibility of emergencies, the Morgantown site maintains an emergency response system, including a hazmat team. Several NETL directives specify the response to emergencies. If a spill occurs, the first person to notice the spill has the responsibility to report it immediately to site security. This will initiate an investigation and response that is proportional to the perceived potential threat or



risk. NETL personnel who participate on the hazmat team or other response teams are trained to contain and control a spill or cleanup, as warranted. Emergency response drills are conducted annually. Where potentially needed, lab-specific operating procedures specify how to control and shut down various lab activities in the event of an emergency.

During 2005, hazardous waste management inspections focused on proper control of hazardous materials within the lab spaces. Any deficiencies were entered into the AIIIS tracking system and appropriate actions taken to correct these findings.

On December 12, 2005, the WVDEP Division of Water & Waste Management conducted a surprise inspection. No areas of non-compliance were found.

6.2 National Environmental Policy Act

The National Environmental Policy Act (42 U.S.C. 4321 et seq., 1969), establishes federal policy for protecting the quality of the environment. The Act establishes three

levels of review for federal actions: environmental impact statements (EIS), environmental assessments (EA), and categorical exclusions (CX). Under the highest level of review, an EIS is prepared to evaluate the environmental consequences of any major federal action that might have significant impact on the quality of the environment. The EIS must include a comparative analysis of those realistically available alternatives that would accomplish the same goals that the federal action is expected to address. Based on the EIS, a record of decision is prepared to document which alternative will be pursued.

If it is not clear from the scope of the federal action that an EIS is necessary, or if the potential for environmental impacts from the proposed action is uncertain, the second level of review, an EA, is prepared. Based on the analysis in the EA, a determination is made that either the potential environmental impacts warrant preparation of an EIS, or the impacts are not significant and a finding of no significant impact (FONSI) can be issued.

If the federal action does not have a significant effect on the environment, either individually or cumulatively, then the third level of review, a CX, is warranted. These types of federal actions can be excluded from an in-depth NEPA review. DOE has determined that certain classes of actions do not individually or cumulatively have a significant effect on the human environment, and might, therefore, be covered by a CX. A list of the CXs, as well as the eligibility criteria for their application, is identified in DOE's NEPA Implementing Procedures (10 CFR 1021).

NETL conducts NEPA reviews for both on-site actions and off-site actions proposed for funding by the federal government. These include actions planned in cooperation with other governmental organizations, educational institutions, and private industry. NETL performed 615 NEPA reviews in 2005 that resulted in CXs.

The following environmental impact statement activities took place in 2005:

FutureGen

NETL provided extensive background investigation into the NEPA requirements for the FutureGen Research Initiative which is aimed at creating the world's first coal-based, near-zero emissions electricity and hydrogen production power plant. The 275-megawatt FutureGen plant will employ advanced coal gasification technology integrated with combined cycle electricity generation, hydrogen production, and capture and sequestration of carbon dioxide. In order to achieve the aggressive integration, environmental, performance, and economic goals, the DSM research group is developing high-fidelity device-scale models and integrating them into FutureGen plant simulations using NETL's Advanced Process Engineering Co-Simulator (APECS). The APECS co-simulations, combined with advanced visualization and high-performance computing, will help NETL system analysts



to better understand and optimize the fluid mechanics, heat and mass transfer, and reaction kinetics that drive overall FutureGen plant performance and efficiency. On July 28, 2006, DOE issued a notice of intent to prepare an EIS for the proposed action of providing up to \$700 million of federal funding for the FutureGen Project.

Gilberton Coal-to-Clean Fuels and Power Project

WMP PTY, LLC was the contractor selected under Round 1 of NETL's Clean Coal Power Initiative to develop the Gilberton Coal to Clean Fuels and Power Project. This project would involve the construction and operation of a plant integrating gasification technology and Fischer-Tropsch technology. Using a feedstock of 4,700 tons per day of anthracite coal waste, the plant would produce about 5,000 barrels per day of clean liquid fuels (diesel fuel and naphtha) and about 41 megawatts of electricity. A draft EIS (DOE/EIS-0357) was issued in late November 2005 to Congressional staff and national stakeholders, as well as to local stakeholders. At the same time, a notice of availability was posted in the Federal Register in December 2005. DOE also planned to conduct two public hearings (in early 2006) to seek stakeholder comments on the draft EIS. DOE expects to issue the final EIS in 2006.

Western Greenbrier Co-Production Demonstration Project

An EIS (DOE/EIS-0361) is being drafted for the Western Greenbrier Co-Production Demonstration Project to be located in Rainelle, Greenbrier County, West Virginia. This project was selected from a competitive solicitation for Clean Coal Power Initiative demonstration projects and would involve the construction and operation of a plant using approximately 1,610 tons per day of coal waste from existing gob piles as feed to a circulating-fluidized bed boiler. The demonstration plant would produce 90 megawatts of electricity, recover waste heat to support an eco-park, use coal ash for production of structural brick, and generate alkaline product ash to be used to remediate acid mine drainage.

Orlando Gasification Project

Southern Company Services, Inc. was selected under Round 2 of the Clean Coal Power Initiative to demonstrate a coal-based transport gasifier which has a fuel-flexible design projected to have higher efficiency and lower capital and operating costs than the currently available oxygen-blown entrained-flow gasifiers. The demonstration plant would be built in Orange County, Florida, and would generate 285 MW (net) of electricity using sub-bituminous coal. A notice of intent to prepare an EIS for the Orlando Gasification Project was published in the Federal Register on August 11, 2005. A scoping meeting was held on August 30, 2005. The public scoping period ended on September 16, 2005, and preparation of the draft EIS (DOE/EIS-0383) was initiated in the final quarter of 2005. DOE plans to issue the draft EIS for public comment in the summer of 2006.

Mesaba Energy Project

Excelsior Energy was selected under Round 2 of the Clean Coal Power Initiative for the Mesaba Energy Project. The objective is to design, construct, and demonstrate a utility-scale next-generation integrated gasification combined cycle (IGCC) electric power generating facility, which includes the ConocoPhillips E-Gas™ carbonaceous solids gasification technology. The planned installed capacity is up to 600 MWe

(net). A notice of intent to prepare an EIS was published on October 5, 2005. Scoping meetings were held on October 25 and 26, 2005. The public scoping period ended on November 14, 2005. The draft EIS (DOE/EIS-0384) is in preparation.

The following three efforts to prepare EIS documents remained on hold, pending resolution of economic issues related to the proposed projects.

- Following public scoping meetings held at various locations throughout the U.S. in 2004, DOE had anticipated a draft PEIS (DOE/EIS-0366) would be available by late December for implementing the Office of Fossil Energy's Carbon Sequestration Program. The effort is now on hold.
- NETL activities on EIS-0284 for the Low Emission Boiler System Proof-of-Concept Project, to be located in Elkhart, IL, by the Oak Ridge National Laboratory, are on-hold awaiting resolution of financing issues related to this project.
- For the TIAX, LLC Project (formerly the A.D.Little integrated advanced hybrid NOx control project), a NEPA questionnaire was completed in CY2004. NEPA determination and development activity was scheduled for completion in June, 2006; however the project initiation activity is being terminated. On May 31, 2006 the NETL Contracting Officer sent a letter to TIAX acknowledging receipt of their letter withdrawing from further negotiations and concurring with that decision. NETL plans no additional action on this project.

In addition, the following EA reviews took place in 2005:

- For the LNG from Coal Mine Methane for Industrial and Transportation Applications Federal Number 2 Mine Parrish Shaft Project in Monongalia County, WV, a draft EA (DOE/EA-1546) was completed in November, 2005. The draft EA was made available for public review and comment in late December, 2005.
- For Peabody Energy's Airborne Process Commercial-Scale Demonstration Program (located in Grants, New Mexico), the industrial participant was waiting for the State of New Mexico's response on the need for an air permit.

6.3 TSCA

During 2005, there were no unplanned releases of air pollutants covered by CERCLA or TRI regulations. Asbestiform fiber concentration air monitoring is conducted annually in Buildings 1, 2, 3, 4, 5, and 7 because asbestos-containing building materials were used in the construction of these facilities. No samples taken this year contained fiber concentrations in excess of EPA and State of West Virginia clearance levels (0.01 fibers/cc). Occasionally, fiber concentrations do exceed that limit, but second level analysis has always verified that the excess was caused by higher levels of non-asbestos fibers. The observed concentrations of asbestos fibers have always been below the clearance level.

Samples taken in Buildings 2 and 5 revealed high fiber concentrations, so the samples were further analyzed by transmission electron microscopy to determine whether the fibers were asbestos. The additional testing revealed no asbestos fiber problems. Air sampling in Buildings 1, 3, 4, and 7 revealed fiber concentrations below the EPA and State of West Virginia clearance levels (0.01 fibers/cc). Monitoring for asbestiform fibers is performed each year. The observed concentrations of asbestos have always been below the clearance levels. However, there are occasions when the total fiber concentrations exceed the clearance levels established in the permit due to high concentrations of non-asbestos fibers.

6.4 Radiation Protection

Because the Morgantown site is not a nuclear facility, it does not have a radiological program of comparable size and complexity to programs found at nuclear facilities. The site does not generate radioactive materials; and it does not transport, process, treat, store, or provide onsite disposal of radioactive waste. NETL does not have an extensive program for protection of the public and the environment from radiation hazards because its sources are all small, sealed instrumentation sources that preferably would be returned to the instrument manufacturer when not wanted at NETL. For these reasons the radiological program at the Morgantown site has been described within our regular ES&H (non-radiological) program information. Additional information may be found in [Section 4.4](#) (Atomic Energy Act of 1954), and [Section 4.3](#) (DOE Order 435.1, Radioactive Waste Management).

Non-applicable radiological program requirements for NETL in 2005 include the following:

- Price-Anderson Amendments Act of 1988, as amended in 1992
- USC, Title 10, Part 71, Packaging & Transportation of Radioactive Material
- 10 CFR 834 (draft), Environmental Radiological Protection Program
- 40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities
- DOE Order 5400.5, Radiation Protection of the Public and the Environment
- DOE Order 435.1, Radioactive Waste Management

6.5 Air Quality and Protection Activities

The first of three environmental media protection programs is the NETL Ambient Air Quality Program. Significant requirements and responsibilities of this program are listed in NETL Procedure 450.1-1, NETL Ambient Air Quality Management. Under this program, the Federal Air Quality Manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Several EMPs have been created recently to foster continuous improvements by focusing attention on a few of the emissions categories or sources where NETL can make the most improvement. To maintain quality control in our program, NETL selects and subcontracts analytical work only to EPA-certified laboratories. These laboratories must submit their QA/QC manuals to NETL for inspection, and the NETL site

support subcontractors submit quality control samples (duplicates, blanks, and spikes) to the laboratories to verify the quality of the analyses. Where possible, air emissions monitoring systems onsite are checked or calibrated.

In 1995, NETL obtained an air emissions permit (Number R13-1786) from WVDEP for construction of the GPDU. The GPDU did not run in 2005 and will be decommissioned.

NETL staff began sampling the emissions of TRI-listed compounds in laboratory fume hoods and flues as part of the ISO 14001 efforts. Under EMP 5.5, various devices were employed to sample organic compounds within the ductwork and stacks. These investigations identified the various compounds in the vents and measured the emission rates of these compounds. Five-liter evacuated canisters having a nickel lining were inserted into the hoods and flues. Organic compounds adsorb on the nickel and desorb as a function of partial pressure and relative affinity. After the sampling period, each canister was sent to a testing laboratory, where the contaminants were desorbed and measured. The results of the hood emissions monitoring activities may be used for a future EMP designed to reduce NETL's emissions as part of the Assistant Secretary for Fossil Energy's pollution prevention goals under TRI. This study aims to determine NETL's current emissions, which previously have been crudely estimated using material balance approaches. NETL annually reports its air emissions inventory as an in-house check on its status as a non-regulated source.

There are several EMPs that direct NETL's continuous improvement efforts in air-quality protection. Two EMPs are designed to reduce emissions of ODSs. One seeks to phase out NETL's use of Class I ODS in smaller appliances such as drinking water fountains; the second will replace selected large chillers that air condition large office buildings. A third EMP will reduce emissions of volatile organic compounds (VOCs) from paint operations. A fourth EMP deals with vehicles, where the consumption of petroleum products and the emissions of air pollutants will both be reduced.

WVDEP generally evaluates air quality on a county basis, although the regional data may be aggregated into Air Quality Control Region (AQCR) #6, for North Central West Virginia. Monitoring is performed in Morgantown on a daily basis at several sites, and these data are available from the WVDEP website's air-quality index and from the EPA AirNOW webpage. During 2005, Morgantown was in attainment for all national ambient air quality standards (NAAQS). In 2004, the EPA classified a portion of northern Monongalia County as a non-attainment area for PM_{2.5}. Thus, the NETL site is not a significant contributor to ambient air quality problems.

During 2005, there were no new source reviews (i. e., Clean Air Act pre-construction reviews) for any NETL–Morgantown facility, nor were there any Morgantown facilities with the potential to emit more than 100 tons/year of any designated air pollutant. Until the certificate to operate expires in June, 2006, the WVDEP continues to regulate NETL's GPDU as a minor source of emissions affecting NAAQS. The permit limits GPDU operations to a maximum of 1,440 hours per permit year (July 1 through June 30). During 2005, the GPDU did not operate and will be decommissioned. See [Table 6.5](#) for additional information on this permit.

The NETL site in Morgantown is not regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAPS) Program. Nor does the site emit more than 10 tons/year of any single designated toxic air pollutant or more than 25 tons/year in aggregate of all toxic air pollutants, which would otherwise qualify it as a major source requiring regulation under the Clean Air Act for listed toxic air pollutants. Although WVDEP does regulate a number of minor sources of toxic air pollutants, the NETL site has not been regulated in this category. The Morgantown site does not perform nuclear program work and does not have radiological emissions, which would be covered by NESHAPS.

6.6 Water Quality and Protection

The next environmental media protection program deals with surface water quality, including discharges to municipal sewers that eventually discharge to surface waters. Surface water protection on site is controlled by NETL Procedure 450.1-3, *Surface Water Quality Management*, which is administered by the Surface Water Quality



Manager (SWQM). Generally, this program includes spill prevention, hazardous waste control, and emergency actions, which are addressed specifically in other directives. The surface water program covers permits and monitoring for storm water sewers (which are separate from sanitary sewers) on site and for construction-related disturbances that potentially increase sediment loads in streams. The applicable directives are supplemented by more detailed instructions that are found in the Storm Water Pollution Prevention Plan, which documents the

various potential sources of pollution and the prescribed methods for managing the various types of sources. Under the plan, twice per year designated storm water outfalls are sampled and tested for basic pollutants (see [Table 6.6.1a](#)) that might indicate contamination from site applications of fertilizer or leaking sewer lines (see [Table 6.6.1.b](#)). Should a spill occur, cleanup would commence and the appropriate outfalls would be monitored, as necessary, for the contaminants of concern. For all water protection programs, quality control in sample analysis is maintained, in part, by choosing an analytical laboratory from a list of EPA-approved laboratories. QA/QC samples are submitted at least annually to further verify the quality of the analytical results. On December 7, 2004, the WVDEP approved NETL's re-registration under the general storm water permit.

On the developed portion of the Morgantown site, there are four drainage areas that have rainwater runoff collection systems and regulated outfalls to the nearby surface streams.

- Outfall 002 drains an area that holds the majority of the facilities for material handling and is approximately 509,652 square feet in area.
- Outfall 003 receives drainage from a hillside beside B-17 and drains an area of 43,560 square feet. The permit does not require monitoring of this outfall.

- Outfall 005 drains an area that includes Building 19 (warehouse, machine shop), Building 33 (hazardous materials temporary storage), and various research facilities. It drains an area of 209,088 square feet.
- Outfall 010 drains parking areas, offices and a large section of undeveloped land. It drains an area of 3,197,304 square feet.

The outfalls at the Morgantown site are monitored according to General Permit Registration #WVG610042 under NPDES Permit #WV0111457. Major sources for potential spills of petroleum products and oils are aboveground storage tanks, oil-filled transformers and switches, a hazardous waste accumulation facility, and 55-gallon drums stored at several locations (Buildings 5, 19, and 36). Presently there are six aboveground storage tanks that contain petroleum products (diesel fuel and gasoline) and one that contains ethanol, for a total capacity of 2,900 gallons. Three of the aboveground storage tanks are located inside the area drained by Outfall 002. There are two additional aboveground storage tanks located in the drainage area of Outfall 005, and the remaining two are in the drainage area of Outfall 010. Currently the site has 25 oil-filled transformers and two oil-filled switches, all of which have been tested for PCBs. In addition to the tanks of petroleum products and ethanol, there were three storage tanks associated with the GPDU, a project designed to test technologies for removing sulfur gases from hot coal gasification syngas. The GPDU was decommissioned and these tanks were removed during 2005. One 6,000-gallon tank held sulfuric acid. Two other tanks, a 15,000-gallon tank caustic tank and a 5,000-gallon caustic tank were empty. Because these tanks pose a significant hazard if their contents are released, the storage facility was designed to contain the entire volume of these tanks. There are no buried or partially buried storage tanks at the Morgantown site. Although the major potential spill sources are described herein, there are numerous smaller potential sources that are described in a site inventory list.



An oil-water separator is installed inside the runoff collection system of the new parking garage, but there are no other treatment systems for storm water at the Morgantown site. Based on previous test results, the primary concern with surface water impacts from the NETL site has been sediment loading.

Sediment loading of surface water runoff affects Burroughs Run along the southeastern margin of the site, West Run along the northeastern margin of the site, and a small stream that traverses the northern portion of the site and empties into West Run. The State of West Virginia has recently launched a program to categorize streams by water quality and to establish minimum water quality criteria for each category. It is anticipated that both West Run and Burroughs Run would be categorized as impaired streams that require the establishment of TMDL limits and further regulation. West Run is highly acidic from mine drainage located on the upper reaches of the drainage basin, and suburban development is increasing within the basin. Burroughs Run drains an area of significant urban and suburban development, which contributes typical urban/suburban pollution (e.g., oil, salt, pesticides, and herbicides).

Although storm water runoff is handled by storm water sewer systems, a completely separate and dedicated sewer system handles the industrial wastewater. A third separate and dedicated sewer system on site handles the domestic sewage. Industrial wastewater quality on site is controlled by NETL Procedure 450.1-4, *Industrial Wastewater Management*, which is administered by the Industrial Wastewater Quality Manager. At the Morgantown site, industrial wastewater is that wastewater conveyed from laboratory sinks and laboratory facilities where pollutants other than normal domestic sewage might enter the wastewater stream. The industrial wastewater enters a clarifier located onsite, where the wastewater is sampled monthly. From the clarifier the industrial wastewater enters the onsite domestic sewage lines that empty into the municipal sewers owned and operated by the Morgantown Utility Board (MUB). The discharge is regulated under Pretreatment Permit Number MUB 012. Periodic sampling is performed, and the samples are analyzed by a laboratory chosen from a list certified by the EPA. Discharge monitoring reports (DMRs) detailing monthly sampling and analysis are provided to the MUB (see [Table 6.6.1.d, NETL-Morgantown 2005 Wastewater Effluent Analysis](#)). NETL's monitoring activities help to enforce the requirement that hazardous wastes are not permitted in the laboratory drains or other drains, except in the trace quantities that normally originate from washing laboratory equipment and glassware. Managers are required to provide suitable containers in laboratories for the collection of materials that are not permitted in the drains. If hazardous materials or petroleum products accidentally spill into the sewer system, NETL must follow the emergency response and notification procedures specified by the Spill Prevention and Control Management and the Comprehensive Emergency Management System directives (NETL P 450.1-5 and NETL O 151.1, et seq., respectively). Hazardous waste must be handled in accordance with NETL's directives on this subject. If pollutant concentrations repeatedly exceed permit limits, NETL will initiate surveillance of drains and fixtures that discharge into the industrial wastewater system to identify the source.

Protection of surface water and groundwater requires the prevention of leaks from storage tanks. Accordingly, NETL instituted a program under NETL Procedure 450.1-5, *Spill Prevention and Control Management*, which is under the oversight of the Federal Surface Water Quality Manager (SWQM). As required by the NPDES storm water permit, this program mandates a written spill prevention, control, and countermeasures plan (SPCC) for each site and a written operations and maintenance plan for each individual storage tank system. Every system capable of contributing to fire, explosion, emission, or spill of hazardous materials must have written operating plans that address precautions to prevent an emergency and actions to be taken during an emergency. The program manager must identify potential spill sources on site, establish visual inspection programs, generate lessons learned (and program improvements) from past spills, and coordinate the implementation of this procedure with the NETL emergency response activities. There have been no reportable spills of toxic or hazardous materials within the notification period (November 1996 to the present) of the current general storm water permit.

Aboveground storage tanks are visually inspected on a weekly basis and have their interstitial cavity checked quarterly. Visible leaks are corrected immediately. Oil-filled transformers and switches are visually inspected daily. If leaked materials are

observed within secondary containment or on the surrounding ground surface, the material is collected or absorbed with spill kits. To the extent practicable, contaminated soil and rainwater are collected and disposed in accordance with regulations. Steel 55-gallon drums are kept within areas protected from rainwater and within secondary containment. Large spill containment kits are used routinely as a means of secondary containment underneath the drums, and spill kits are kept nearby. The Hazardous Waste Accumulation Facility (Building 33) is designed and constructed to be compatible with the materials stored there and with the conditions of storage. Leaks within this facility will drain to sump areas that have manual sump pumps for collection of liquids. All of the storage area of Building 33 is inside, and the facility is inspected each week. At the Morgantown site, hazardous materials are not conveyed through underground pipes, with the exception of acid conveyed to the GPDU. GPDU pipes are contained inside larger PVC pipes, which slope back to secondary containment pits to prevent soil contamination. All aboveground pipe valves are inspected when the associated tanks are inspected. All tank filling operations must be attended constantly, and offsite personnel are accompanied by NETL personnel when they enter the site for refueling or loading operations.

Emergency containment actions would consist of placing absorbent materials at the source of the spill, at any potentially-affected drains and at the entrances and exits of culverts. Any contaminated materials collected following a spill would be disposed in accordance with applicable regulations. Spill kits of varying types are placed at numerous locations throughout the site. Personnel and equipment are committed and on standby to respond to spills, and emergency notification procedures are taught to the NETL staff via CBT modules.

NETL-Morgantown has only one discharge to the municipal sewer system which is regulated by the MUB (Permit MUB 012). MUB establishes the pretreatment requirements and the effluent standards. Annually, MUB inspects the pretreatment facility plus the sewer connection. When the permit is renewed, MUB requests an update to the description of the industrial wastewater system and the sources of wastewater on site. When the industrial wastewater system is modified or when there is a change in effluent composition, notification is required. MUB may elect to change the monitoring or pretreatment requirements in response to the changes made by NETL. MUB requires monthly sampling and analysis for the parameters listed in [Table 6.6.1.c](#). They require that NETL annually sample and analyze for priority pollutants in accordance with the MUB permit, and MUB conducts an independent sampling and analysis to verify our results. Biological testing is neither required nor performed. MUB requires that the Morgantown pretreatment system have at least a settling clarifier and a pH control system. Industrial wastewater from the Morgantown site could contain chemicals from our laboratories and projects, oil and grease from our motor pool maintenance area, or glycols (ethylene and propylene) from our chiller units (for air conditioning). History has shown that the primary concerns for discharges to the municipal sewer have been trace acids from research projects and alkaline boiler blow-down from the main boiler room.

6.7 Executive Orders

6.7.1 EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition

NETL implements a program for recycling and part of another program for waste prevention at the Pittsburgh site. Refer to [Section 8.7.2](#) for information on waste prevention and recycling at Pittsburgh. Currently, many purchases are made by the Morgantown warehouse for both the Pittsburgh and Morgantown sites, so the affirmative procurement program for both sites is presented below.



EO 13101 establishes a general approach and goals for affirmative procurement and for recycling activities by federal agencies. The stated goal is to incorporate waste prevention and recycling into a Federal agency's daily operations and to increase and expand the markets for recovered materials through preferential purchasing, consistent with the agency's need for efficiency and cost effectiveness of operations. It directs each agency to establish an affirmative procurement program and a recycling program. Affirmative procurement means the purchasing of goods and services that have a less adverse impact on the environment throughout their life cycle and that are reasonable for the government to purchase.

Results must be tracked and reported. The goal is 100 percent procurement of goods normally used at a site that meet EPA guidelines, except for those products for which written justification is given for avoidance. The EPA must designate items that meet this requirement in their Comprehensive Procurement Guideline. Onsite recycling goals for each agency are to be established progressively for years 2000, 2005, and 2010.

NETL implements this EO, in part, with NETL Procedure P 541.2-1B, *Affirmative Procurement Program*. This program makes employees aware of the opportunities for purchasing products designated by the EPA for recycled content. Government credit card purchases are monitored for compliance, and metrics are tallied each year for purchases by the warehouse and others.

NETL takes a two pronged approach to this program. The first prong establishes a program of affirmative procurement through the warehouse. The warehouse purchases and distributes common supplies (e.g., office materials) to the sites. The second prong is based on continuous training of the professional purchasers and the government credit card holders to make the affirmative choice when purchasing. The trust placed in the purchasers is not blind – the purchases are monitored.

One or more lists of green products are produced and made available on the NETL Intranet. When items are needed, the prospective buyer is encouraged to first determine whether used or excess items are already available on site (Intranet-based lists of office supplies, furnishings, tools, chemicals, etc.). If not, the prospective buyer is encouraged to obtain the items from the warehouse, which stocks green items. As a last resort, the prospective buyer can directly purchase the items. Recent enhancements to the small purchase system software require prospective buyers to provide justifications if they choose to buy non-affirmatively.

NETL's cost-benefit experience with affirmative procurement has been mixed. Some recycled content items have been more expensive than comparable non-recycled content items. Others have been less

expensive; so, on average, there is no net cost benefit. Figure 6.7.1 shows the money spent by the Morgantown warehouse on green items and the money spent on all items. About 46 percent of the money was spent on green items during FY 2004.

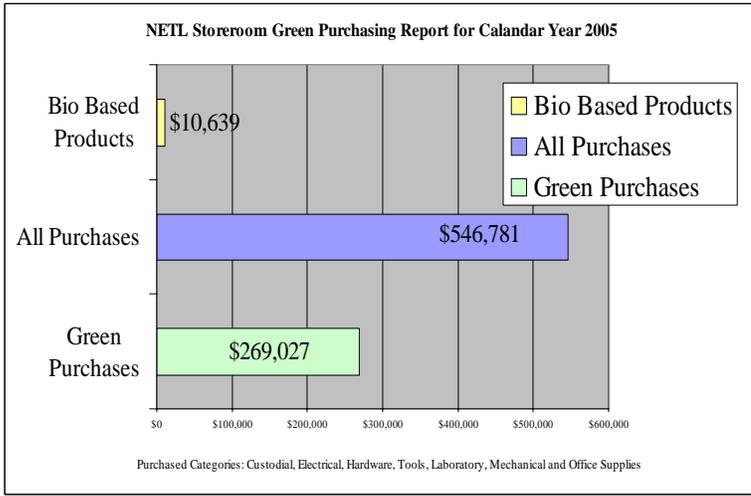


Figure 6.7.1 – NETL Storeroom Green Purchasing Report for CY 2005

The purchase of green items is a function of availability and demand, as shown in Figure 6.7.2. During FY 2005, NETL achieved the goal of purchasing 100 percent green items for the NETL storeroom.

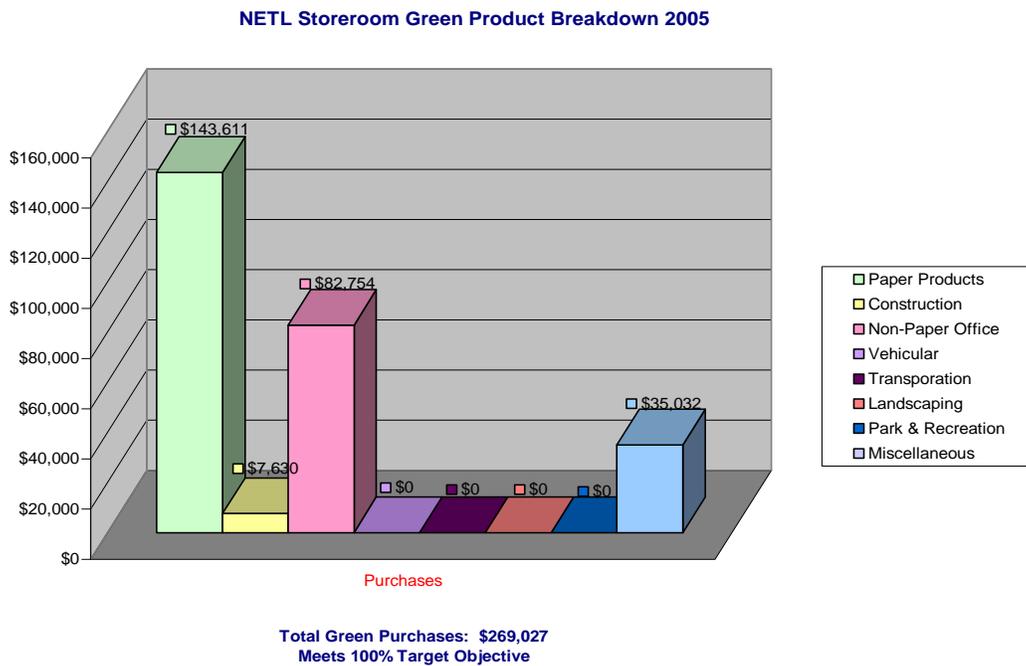


Figure 6.7.2 – NETL Storeroom Green Product Breakdown 2005

6.7.2 EO 13123, Greening the Government through Efficient Energy Management

The following information is specific to the Morgantown facility. More complete information on the NETL Efficient Energy Management Program, as well as a description of the NETL-Pittsburgh program, is available in [Section 8.7.3](#).

In early 2005, NETL was given permission to pursue Title III Phase I construction activities for the new Technology Support Facility (TSF). In August 2005, NETL began construction on the TSF. This construction phase included site excavation and foundation and foundation wall construction. When completed the TSF will be a multi-story, 106,000-square foot building and house 168 offices. The TSF was designed and is being constructed to obtain U. S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) gold certification. The facility will be one of the most energy efficient and cost effective Federal structures built. The Department of Energy and NETL will realize utility and operational cost savings of approximately \$1.5 million dollars annually. The TSF is scheduled for completion in FY08.

NETL, through its Morgantown, WV site, began implementation of a DOE Federal Energy Management Program (FEMP) model program in 2004. This co-funded program, which includes \$57,000 of FEMP funding, incorporates energy utility meters and Square "D" programmable logic control (PLC) programming in Building 26, a multi-story, 63,062-square foot office/conference/administrative facility. The metering installation and associated PLC programming will monitor and analyze annual and real time energy usage in the facility. The initial analysis of this model program will establish an annual baseline energy usage. Analysis in subsequent years will verify energy savings of installed energy conservation retrofit measures. The measurement and verification criteria of this model program will be the cornerstone of the energy management program and energy conservation projects and will validate NETL's energy savings performance. The intent of the model program is to demonstrate the benefits of obtaining the Energy Star Building label and to share the information with other sites in the DOE complex so that final results can be duplicated or improved.

Fiscal Year 2005 efforts for this DOE/FEMP/NETL model program included installation of Building 26 utility meters (natural gas, steam, and electricity) and preliminary programming of the "Square D" PLC system. FY2006 efforts will finalize installation of utility meters, on site programming of the PLC system, shakedown operations of system components, and initiation of baseline energy data collection.

6.8 Groundwater and Soil Quality Protection Activities

The third environmental media protection program deals with groundwater quality, including the monitoring and cleanup of leaks and spills that enter the soil and groundwater. Groundwater protection on site is controlled by NETL Procedure 450.1-2, *Groundwater Quality Management*, which is administered by the Federal Groundwater Quality Manager. This is a fundamental program that covers regulatory

requirements and best management practices for preventing leaks and spills for groundwater and soil monitoring, contaminated soil removal, and closeout actions. The directive is supplemented by more detailed information and instructions that are found in the Groundwater Protection Management Plan, which documents the site hydrogeology, various potential sources of pollution, potential contaminants that should be monitored, methods of well installation and sampling, a monitoring strategy, and QA/QC processes related to having water/soil samples analyzed by a contracted laboratory. Complete maps of the site aquifers and wells are contained in the plan. Under the plan, selected monitoring wells are sampled and tested twice every year for general water quality parameters and for selected chemicals or metals that might indicate contamination from known past leaks and spills. Should a spill occur, containment and cleanup would commence, and the affected soil would be monitored as necessary for the contaminants of concern. Highly contaminated soil would be removed, if practical. Alternatively, in-situ treatment would begin, unless the contamination levels were sufficiently low to warrant only monitoring. For all water protection programs, quality control in sample analysis is maintained, in part, by choosing an analytical laboratory from a list of EPA-certified laboratories. QA/QC samples are submitted at least annually to further verify the quality of the analytical results.

The primary strategy for groundwater protection is one of spill and leak prevention. The Morgantown site has a Spill Prevention, Control, and Countermeasures (SPCC) Plan and a Storm Water Pollution Prevention Plan. Together, these plans lay out the strategy for minimizing the risk of unintentional releases and quickly responding to an unintentional release in an effort to minimize environmental contamination. In addition to these efforts, the Morgantown site initiates new projects only after a

rigorous ES&H review is conducted in accordance with the SARS directives. As part of the SARS process, the responsible person for each project must prepare a set of written procedures documenting how the project is to be operated, how waste and feed-stocks are to be safeguarded, and how to contain and control unintended releases. When a leak or spill does occur and the environment is threatened, the onsite emergency response team is activated, and the facility makes the appropriate internal and regulatory-driven notifications.

Twenty active monitoring wells exist at the Morgantown site (see [Figure 6.8.1](#)). These wells monitor two shallow aquifers within the unconsolidated Lake Monongahela sediments

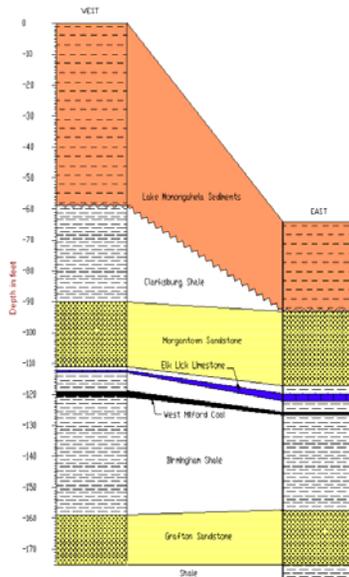


Figure 6.8.2 Generalized cross-section of aquifer units at the Morgantown site.

and one bedrock aquifer, the Morgantown Sandstone. None of these aquifers are used as a source of water in the immediate area. Figure 6.8.2 shows a generalized cross-section through the site and the relationship between the aquifers.

One well (SP8-A) completed in the Lake Monongahela sediments was plugged during 2005 due to construction of the new TSF. All wells are sampled annually for pH, water level, conductivity, and temperature.

No groundwater contaminants have ever been consistently detected at higher than regulatory levels at the site. Groundwater monitoring at the Morgantown site is focused primarily on past spills, leaks, and the effectiveness of the cleanup actions undertaken. The section on CERCLA ([Section 6.1.1](#)) lists the past events and the current status of these spill sites.

An informal agreement exists between NETL and WVDEP concerning the Pond 005 site located north of Building 7. That area is now a parking lot. When the pond was closed and the area was converted into a parking lot during 1985, the closure was not consistent with the state-approved closure plan. Sampling indicated that low concentrations of semi-volatile organic compounds remained in the soil after removal of the pond liner. The plan called for removal of all the contaminated soil. But after removing many truckloads of soil, NETL decided to forego further removal despite the fact that some contaminated soil remained. NETL then constructed a parking lot on the site. The informal agreement subsequently reached with WVDEP requires groundwater monitoring around the parking lot perimeter. NETL continues to comply with this requirement. Five wells (I, J, L, M, and N) associated with the now-closed Pond 005 and completed in the Lake Monongahela sediments are sampled semiannually for benzene, toluene, ethylbenzene, xylenes, naphthalene, phenolics, cadmium, sulfates, sulfides, and chlorides. Three wells associated with closed Pond 005 (K, L, and N) have detected cadmium at levels above background. However, these have never consistently exceeded the West Virginia limit of 0.005 ug/l in groundwater (see Figure 6.8.3).

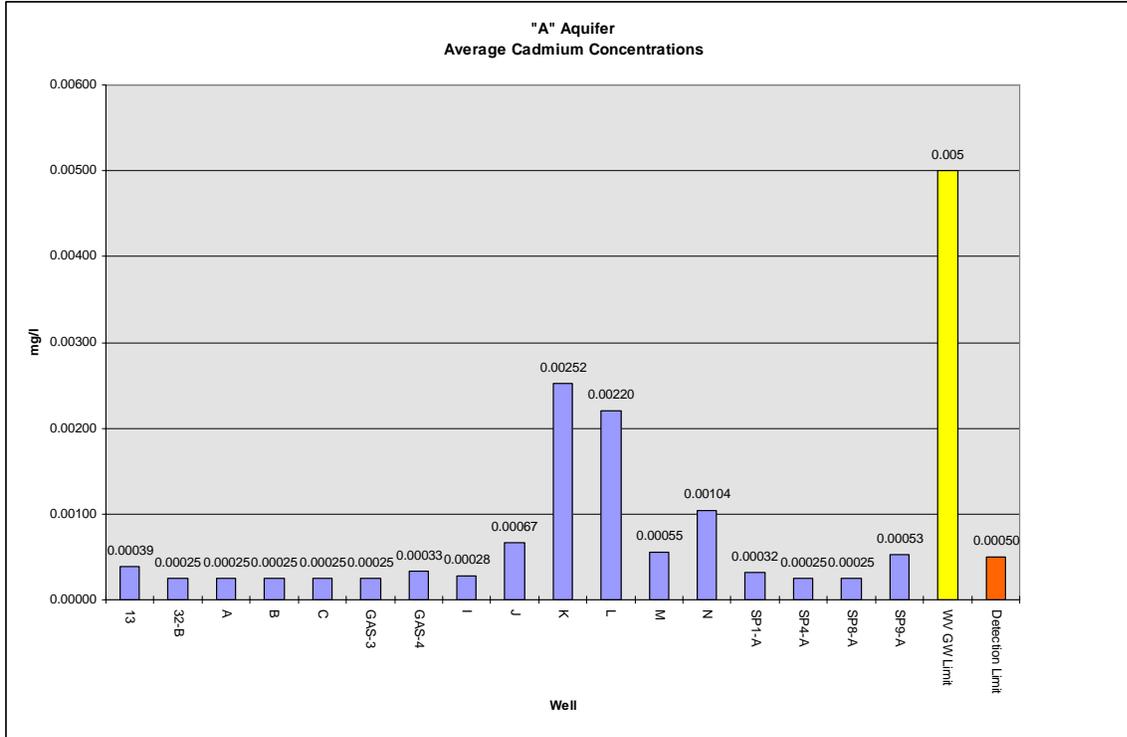


Figure 6.8.3 Average cadmium concentrations in wells, “A” Aquifer, Lake Monongahela unconsolidated sediments.

During the construction of B-19, coal combustion ash was used as fill beneath the concrete floor slab. After completion of the building, leachate appeared having the characteristics of acid mine drainage. The mitigation method that was employed was the installation of collector drains at the footer of the building to collect the leachate and to convey it to a treatment facility that first raises the pH of the leachate into the alkaline range, filters the resulting precipitates from the leachate, and then adjusts the pH to the normal range.

The only contaminants consistently found in significant amounts in the groundwater at the Morgantown site are those related to the application of salts for deicing purposes. Sodium chloride (salt) is applied to the parking lots and roads and calcium chloride is applied to the sidewalks and outdoor steps. Wells located near these features and near the runoff routes from these features show significantly elevated levels of both sodium and chloride compared to background levels (see Appendix [Tables 6.8.1.a, -b, and -c](#)). This impact on groundwater is a problem that is shared with many businesses and road maintenance activities in this region and is necessary to prevent injuries to site personnel and visitors.

The overall groundwater monitoring strategy has been to monitor any flow coming onto the site through each aquifer and to monitor the flow after it passes beneath the NETL facilities and moves toward the springs and seeps. Groundwater monitoring at the Morgantown site from 1993 to 2002 was driven by two reasons. The first was the mandate of the WVDEP regarding the closure of Pond 005. The second was the mandate of DOE Order 5400.1, *General Environmental Protection Program*.

Although DOE Order 5400.1 no longer exists, samples from a large number of wells were analyzed between 1993 and 2002 for a lengthy list of analytes. This list of analytes (see Table 6.6.1.b.) included all organic compounds known to have been detected in analyses of the coal tar waste, the Pond 005 bottom sludge, and the sampled soils beneath Pond 005. It also included metals alleged to have been present in the Stretford solution used to remove sulfur oxides in the offgas from the gasifier. No organic compounds were detected consistently during 10 years of sampling, and no consistent indications of contaminant concentrations above the state limits have been found. Only one analyte (cadmium), traceable to the operation of the closed pond, has been detected.

After 10 years of monitoring, groundwater conditions are well understood. Spills and leaks in the past have not significantly degraded the groundwater on site. The facilities and most of the underlying contaminated soils associated with spills and leaks in the past have been removed. In recent years, operations have changed greatly, and there are now few large projects that could create significant groundwater contamination. At this point, most of the research is bench-scale and uses small quantities of chemicals and solvents. Accordingly, the groundwater analyses have been significantly curtailed. Under the new scheme, wells will be sampled each spring and fall. Wells located around the perimeter of the developed portion of the site in the two shallow aquifers will be tested to check water quality as it enters and leaves the developed area. For the deep aquifer, sampling will continue for one up-gradient well and three down-gradient wells. The original list of measurements and analytes, as present in the ASERs of previous years, will be reduced to the list presented in this report. The results of the groundwater monitoring during 2005 are presented in Appendix A: [Table 6.8.1a](#), [Table 6.8.1.b](#), and [Table 6.8.1c](#). Due to problems with a contracted laboratory, wells were not sampled in the fall of 2005. Semiannual sampling will be resumed in 2006.

7.0 PITTSBURGH

7.1 Site Description

The Pittsburgh site resides within Allegheny County, Pennsylvania, at the Bruceton Research Center, approximately 13 miles south of Pittsburgh in South Park Township. This location is about 65 miles north of Morgantown, West Virginia. Geographically, the facility sits within the rolling hills and steeply incised stream valleys that are tributaries to the Monongahela River. The Pittsburgh site is a partially wooded tract with scattered industrial and office buildings. When the Pittsburgh site was first developed, the immediate vicinity was completely rural; however, the population density and housing density have increased in recent years as new subdivisions were built.

Immediately west of the site is a low ridge top with a road and scattered houses. Another road with scattered houses borders the north side of the site. The east side of the site is bordered by Lick Run, the Pleasant Hills Sewage Treatment Plant, and a major local road. Housing development is increasing around the boundaries of the site, especially to the southwest, where new homes overlook the site. Commercial zones are found more than three-quarters of a mile away, although some small businesses are located nearby. About 40 percent of the immediately surrounding land is forested and about 25 percent is pasture or fallow field. Most of the remainder is residential.



With the decline of the steel industry and other manufacturing, the area shifted to retail trade and, more recently, to the service industry. Today the area is widely known for its hospitals and universities. Pittsburgh is still home to a number of large companies such as the H.J. Heinz Corporation, PPG Industries, Bayer Corporation, Alcoa, U.S. Steel, Westinghouse Electric, and U.S. Airways. DOE employs about 510 people at the Pittsburgh site. NIOSH and MSHA employ an additional 502 people, so the entire workforce of the Bruceton Research Center is over 1000. The laboratory is a major employer for the surrounding townships.

7.2 Major Site Activities

Building Renovations

An energy management retrofit project in Building 94 continued in 2005. This project integrates six energy conservation measures into the building which include: expansion of the building management system; upgrade of laboratory hoods and installation of laboratory hood controls; installation of variable speed drives on supply air fans; decommissioning of the makeup air system; replacement of two 225-ton Class I CFC chillers with two high efficiency CFC-free 167-ton chillers; and replacement of existing fluorescent fixtures with high efficiency, 3 tube T-8 fluorescent fixtures. Ongoing renovations were performed on Building 83 to upgrade all building infrastructure, including energy efficient lighting, heating, and HVAC systems. All of the ongoing renovations to Building 58 were completed in 2005. This included renovations to energy efficient lighting and re-circulating hot water heat.

New high efficiency, non-CFC-containing air conditioning systems were installed to replace the CFC-containing systems.

Additional renovations performed on Building 94 included: final installation and operation of two 167-ton CFC-free chillers; operation of the penthouse-located variable speed drive supply air fans; operation of the penthouse-located variable speed drive chilled water pumps; continued expansion of the building management system; continued installation of the expanded roof penthouse; installation of variable speed drive supply air fans; installation of the high efficiency, natural gas-fired, multi-stage boilers (replacing a coal-fired steam heating system); and demolition and removal of the existing Class I CFC R-11 basement-located chillers and reclaiming of the R-11 refrigerant with subsequent shipment to a DOD reclaiming facility.

Low Pressure Steam Boiler System Installed

A new low pressure steam boiler was installed in Building 74 to provide steam heat to Buildings 64, 74, and 92. This system was installed because the former steam system used 95% more energy than the new high efficiency system. This has resulted in both cost and energy savings to DOE for these buildings.

Piping Modifications Completed

NETL designed and completed steam system piping improvements to utilize the boilers located in the Building 84 penthouse, the steam boilers, and the summertime boilers. These modifications were necessary to provide more efficient steam heat to Buildings 59, 86, 89, and 93 by removing the shared, but inefficient, system serving them.

8.0 COMPLIANCE STATUS

8.1 Environmental Restoration and Waste Management

8.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA Section 120 (40 CFR 300-310; 43 CFR 11) subjects Federal facilities to the provisions of CERCLA and imposes an additional set of regulations related to site studies and to notices for the sale and other transfers of Federal real property. Specifically, this section makes all CERCLA guidelines, rules, regulations, and criteria applicable to Federally-owned or -operated facilities, including:

- (1) preliminary assessments for facilities at which hazardous substances are located;
- (2) possible inclusion of such facilities on the National Priorities List (NPL); and
- (3) remedial actions at these sites.

Federal facilities are not required to comply with CERCLA provisions regarding financial responsibility and removal/remediation contracts with state governments. Federal facilities that are not on the NPL still may be subject to state laws concerning removal and remediation actions. However, these state laws and regulations may not impose provisions that are more stringent than those applicable to non-Federal facilities. EPA administers the CERCLA program in cooperation with the Commonwealth of Pennsylvania for the Pittsburgh site. The CERCLIS database lists information about the Pittsburgh site, specifically, that the

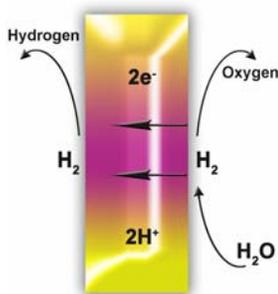
site is not listed as a NPL site. NETL was not listed as a NPL site during 2005 or at any other time in the past.

The Pittsburgh site is listed as “undetermined” on the EPA CERCLA Section 120 List. This is because NETL detected onsite soil and groundwater contamination prior to 1997 and has not been issued a no further remedial action planned letter. Each year, including 2004, NETL provides a status report to the US EPA through the DOE Environment, Safety, and Health Program Office. The status report states the following:

The site sampling and analysis program has been completed. Remediation for areas of concern was completed during FY 1997. Based on the sampling and analysis, no further significant soil remediation is planned. The human health and ecological risk assessment is in the process of being updated. The current conclusion is that exposure to media at the facility is not expected to generate adverse health effects in onsite or current receptors. Groundwater monitoring continued on a routine basis. EPA has been requested to perform a Docket Review, and the Laboratory is waiting on the Docket Status Determination [which is “Undetermined”].

8.1.2 SARA Title III

SARA Title III requires the reporting of hazardous chemicals present at a facility in excess of certain quantities during the preceding year. This includes solid chemicals designated as “extremely hazardous substances” in amounts greater than or equal to 500 pounds or liquids in amounts greater than or equal to 55 gallons, or amounts greater than or equal to the threshold planning quantity (TPQ). It also requires reporting of all other hazardous chemicals present at the facility during the preceding calendar year in amounts equal to or greater than 10,000 pounds. [Table 8.1.2](#) lists those chemicals reported by NETL for 2005, commonly known as the Tier II Chemical Inventory Reporting List.



The NETL Pittsburgh site does not prepare a toxic release inventory (TRI) (Form R) because the site does not use, produce, or process any of the listed toxic materials in quantities that exceed the threshold amounts. During 2005, there were no releases that would trigger emergency notification as required by either Emergency Planning and Community Right-To-Know Act EPCRA or CERCLA.

Section 312 of SARA Title III requires NETL to provide an MSDS to the Pennsylvania Emergency Response Commission, the South Park Local Emergency Planning Commission, and the Broughton Volunteer Fire Department for each hazardous chemical and each extremely hazardous substance existing on site at or above the limits. NETL maintains an active inventory of all hazardous and extremely hazardous chemicals on site along with the MSDS for each of these substances. The Pennsylvania Emergency Response Commission, the local emergency planning

commission, and the local fire departments have all been advised of all materials, quantities, and their location on the Pittsburgh site.

As part of the ongoing commitment to improve emergency planning under the SARA Title III program, NETL has established targets for reducing the accumulation of hazardous chemicals on site. The intent of these targets is to avoid the unnecessary accumulation of potentially hazardous chemicals in the laboratories while maintaining sufficient chemical stores to complete mission-related research. Year 2002 inventories provided a baseline for the target to reduce the number of containers that contain hazardous chemicals. The number of containers that contain hazardous materials in 2002 was 6600 containers. The objective for this target is to reduce the number of containers by 20% by the year 2005. A 20% reduction of such containers would result in 5280 containers by the year 2005.

In order to achieve this 20% reduction in the number of containers by 2005, interim targets were established to ensure adequate progress is being made during 2004. The target for 2004 was set at 5280 containers. The actual number of containers held on-site during 2004 was 4986. This was better than the target by 294 containers and resulted in NETL doing much better than is required for even the more challenging target established for 2005.

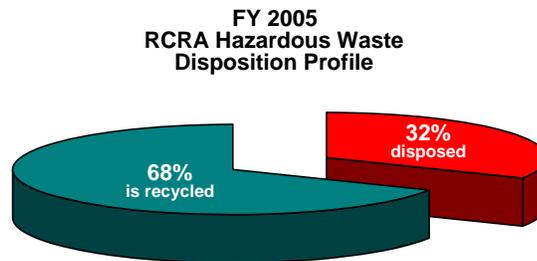
The reduction in number of containers by 294 containers over the target reveals the efforts of the program in striving to reduce the risk posed by such chemicals. The targeted reduction was surpassed because laboratory personnel were encouraged to clean out their laboratories and dispose of old chemicals. This accomplishment was assisted by an improvement to the program which involved the implementation of a real-time chemical inventory system that enables NETL to submit chemical inventory reports in a timely manner, thus avoiding a time lag in removing chemicals from the inventory list.

8.1.3 RCRA Program

Hazardous waste operations at the Pittsburgh site complied with all applicable federal, state, and local regulations that apply to the handling, storage, and disposal of hazardous waste during 2005.

RCRA (42 U.S. Code 6901 et seq.) is regulated through 40 CFR parts 260-271, and the transportation of hazardous waste is regulated through 49 CFR 171-179. The regulations found in 40 CFR 261, Identification and Listing of Hazardous Waste; 40 CFR 262,

Standards Applicable to Generators of Hazardous Waste; and 49 CFR 171-179 DOT Hazardous Materials regulations all apply to the NETL hazardous waste program. NETL Procedure 435.1-1B (now P 450.1-9A), *Waste Handling, Storage and Disposal*, is used to implement these regulatory requirements.



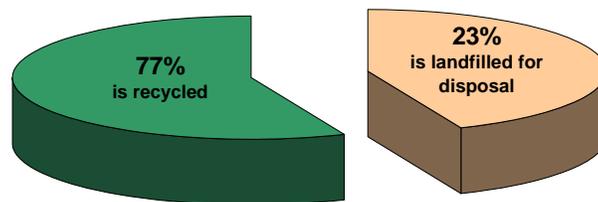
PADEP is authorized to enforce the Federal and state hazardous waste management requirements at the Pittsburgh campus. To help ensure they are current on regulatory requirements, the hazardous waste operations personnel frequently review current waste industry newsletters and bulletins, receive information from the Academy of Certified Hazardous Materials Managers, read NETL's regulatory compliance reviews, and annually attend the hazardous waste operations training and every three years attend the hazardous materials transportation training.

NETL is a large quantity generator and has an EPA Large Quantity Generator Identification Number. Although Pittsburgh generates relatively small amounts of hazardous waste during most months of the year, occasional lab activities result in the generation of larger quantities that exceed the threshold for small quantity generators. Hazardous waste is not retained on site for more than 90 days because NETL does not have a permit to store non-universal hazardous waste for a longer period of time. Most waste is shipped in laboratory packs containing combinations of several different compatible chemicals inside a single container.

The Pittsburgh site is not authorized and does not transport hazardous waste. All hazardous waste transported during 2005 was transported to the storage and treatment facilities of American Environmental Services (AES), Inc. by them. The AES facility combines small packages of similar waste and repackages the waste for more cost-effective shipment to a final disposal facility, which is selected by AES and monitored by NETL. Non-hazardous waste (normal office waste that is not being recycled and cafeteria waste) are transported to a local landfill using commercial waste disposal services.

The hazardous materials handling and waste generation operations were increased during 2005. NETL generated 8,330 pounds of hazardous waste during 2005. The increase in waste generated can be attributed to one time clean out operations of various large and small projects that are no longer in use and to an aggressive program to reduce the chemical footprint. The latter was done by contacting various researchers to verify that all chemical materials that are in storage are still needed. Any items that were deemed unusable were disposed. Please see Section 3.4, Environmental Objectives and Targets, for an explanation of how this quantity was established. This reduction was accomplished using a multitude of reduction efforts. For example, when unused and unopened chemicals were received for disposal, they were offered to other researchers for potential use. Less hazardous or non-hazardous chemicals were substituted for requested hazardous chemicals when possible. Smoke detectors and

**FY 2005
NETL Residual Waste
Disposition Profile**



batteries were sent to manufacturers for recycling. Used computers were offered to schools or offered for sale as excess government property.

Design and engineering studies of facility modifications to improve hazardous waste operations were ongoing during 2005. Design changes for the Chemical Handling Facility were submitted through a multiple-level peer review process to ensure that all stakeholder considerations were included and construction costs kept within budget. Included in the design changes were the closing of two ends of the open building to reduce the impact of weather on the facility. One end was left open to facilitate ventilation to the building. A new HVAC system was designed to protect employees from exposure to hazardous vapors. Also, epoxy sealants were evaluated for use on the building floors to protect against chemical penetration into the building foundation. The chemical storage racks were evaluated and determined to be satisfactory for reuse upon resurfacing. Construction was still ongoing during 2005.

Liquid wastes are kept in drums. The Pittsburgh site does not have a storage or treatment pond. There are no underground storage tanks in Pittsburgh for petroleum or hazardous waste, and there are no above-ground storage tanks for hazardous waste. No leaks were reported from storage tanks during 2005. Liquid acids and bases are collected monthly at the satellite accumulation areas and are analyzed for acidity.

Waste handling and management personnel ensure regulatory compliance by:

- Weekly walkthrough inspections of the Chemical Handling Facility.
- Monthly pickup at satellite accumulation areas.
- Participation in the SARS process.
- Participation in ERO exercises.
- Training on hazardous waste management.
- Regulatory reviews.
- Attendance at conferences addressing hazardous waste requirements.

NETL complies with the RCRA hazardous waste manifest requirements by initiating the documentation before wastes are shipped from the site. The NETL hazardous waste coordinator initiates the documentation and coordinates the completion of the manifest with AES, Inc. and the NETL Federal hazardous waste manager. When AES is ready to ship the waste, the manifest is again checked against the actual shipment to ensure accuracy. All information collected for the manifests, including waste generation forms, waste profiles, contracts, and other documents are retained by the hazardous waste manager with copies sent to the ES&H Records Center.

At NETL, the hazardous waste generators have full responsibility for managing waste that they generate from the moment of generation until the waste is transferred to the waste management organization. The waste generators ensure that all hazardous or potentially hazardous wastes are properly contained and identified at the point of generation. Generators are held accountable for wastes that are not properly contained or identified or are otherwise mismanaged.

Waste handling personnel who collect the hazardous wastes first inspect the container, the labels, and the internal manifest to ensure that the wastes are properly packaged and labeled and that the required documentation is complete and accurate. The waste handling personnel are not allowed to accept or move any hazardous waste without proper packaging, labeling, and identification. The responsibility for identifying the waste rests primarily with the hazardous waste generator.

NETL's Federal hazardous waste manager ensures compliance with applicable regulations by overseeing the entire NETL hazardous waste program. Periodically, the hazardous waste manager reviews the program and brings any deficiencies to the attention of the appropriate individuals or managers. He also ensures the development, accuracy, and submission of the Biennial Hazardous Waste and Waste Minimization Reports to the Commonwealth of Pennsylvania. The manager audits hazardous waste management operations, hazardous waste generators, and TSD facility subcontractors. The manager signs the RCRA manifests and other relevant documentation [e.g., land disposal restriction (LDR) forms, waste profiles, bills of lading, etc.] and maintains the original copy of the RCRA manifests, biennial reports, and certificates of disposal or destruction. The manager ensures that training is provided to employees who require the annual hazardous waste operations and emergency response training (HAZWOPER) so that they may properly perform their duties and responsibilities. Training includes the instruction on the proper handling techniques and disposal methods for chemical waste.

8.2 National Environmental Policy Act

Information about all of the NEPA projects that were performed at NETL in 2005 are consolidated into [Section 6.2](#) above.

8.3 TSCA and FIFRA

TSCA Program. The Pittsburgh campus uses more than 100 different materials containing TSCA-regulated substances. Nearly all of these substances are present in very small amounts, either as preservatives for stock chemicals or as chemical reagents used in the laboratories. None of these TSCA-regulated substances are manufactured by NETL, and consequently, NETL is not subject to TSCA reporting requirements. No PCBs are kept on site for lab use or as a dielectric fluid inside electrical transformers, although oil-filled equipment is occasionally discovered that we cannot be assured was manufactured after July 2, 1979 and is therefore presumed to contain PCBs at a concentration greater than 50 ppm. NETL disposed of 112 pounds of such suspect waste in 2005 consisting of capacitors and lighting ballasts (transformers) from construction and maintenance activities. ES&H staff is not aware of any other PCB-containing devices on site.

[Table 8.3.1](#) lists the TSCA-regulated chemicals held at NETL Pittsburgh in quantities greater than 10 pounds.

Asbestos is perhaps the most abundant TSCA-regulated substance retained on site. NETL has never manufactured asbestos but has used it primarily in building materials that were purchased in prior years. Most is contained within floor tile and floor tile

mastic found on the floors of several lab buildings (e. g., Buildings 74, 83, 86, 94, 95, 141, 903, and 920). The remainder is contained in roofs and in laboratory furniture (Buildings 74, 83, 86, 94, and 921). Asbestos located inside buildings is well encapsulated by the matrix material (e.g., floor tiles). Air monitoring has revealed no shedding of asbestos fibers. Asbestos has been removed from outdoor pipes where it had once been installed. However, asbestos is found on site within some gaskets, inside some lab devices as a refractory material, and in asbestos-containing bricks lining the inside of some boilers. During 2004, there was one new discovery of asbestos on site when a wall was torn down in Building 58 revealing for the first time a seven-foot section of pipe insulated with an asbestos material. Asbestos abatement activities are discussed above in the section on TSCA remediation activities.

FIFRA Program. During 2005, there were no restricted-use pesticides, herbicides, or defoliant kept or used on site. Only general use herbicides were kept and used for routine vegetation control along fence lines, guard rails, and flower beds. This included Round Up®, Prosecutor Pro®, and Sahara®. A commercial pest control company provided routine insect control applications where needed around the cafeteria, buildings, and trailers. Talstar® crystals are spread on the grass to control insects. Demand® is used in the cafeteria and at door thresholds to prevent insects from entering buildings. Herbicides were also used to remove poisonous plants, such as poison sumac and poison ivy, through carefully-controlled spraying of the poisonous plants.

8.4 Radioactive Materials

Use of radioactive materials at NETL is limited to research instrumentation that contains sealed radioactive sources (see [Table 8.3.2](#)) and radiation-generating devices (see [Table 8.3.3](#)). NETL does not generate, process, treat, or have on site any permanent disposal facility for radioactive waste. An inventory of radiation sources is actively maintained and monitored by the Federal radiation safety officer. Information is retained about the item, isotope, quantity, custodian, location, status, and sealed source activity. Title 10 CFR 835.901(e), DOE Policy 441.1, and NETL Procedure 440.1-17 are the applicable regulations and requirements. In addition, best management practices include DOE implementation guides, EPA information, NRC information, and Commonwealth of Pennsylvania recommendations and requirements. All of the radioactive sources are sealed and are used in instrumentation. The site support contractor has the required NRC license for the three Ronan Engineering Company level density gauges. NETL has a sealed source electron capture device that is licensed through the manufacturer. In addition, there are nine radiation-generating devices in six radiological control areas at Pittsburgh. Four of the devices use radioactive source materials, and the other five are in instruments that produce only X-rays. These instruments include two scanning electron microscopes, an electron spectroscopy chemical analyzer, an X-ray diffraction instrument, and an X-ray scanner in the mailroom.

Radiation monitoring performed at NETL consisted of using a limited number (less than 20) of personal dosimeter badges and rings supplied to potentially-exposed employees. In addition, there are specific radiological control areas which have

dosimeter badges continually displayed. Leak testing is performed every 6 months on all applicable sealed sources, and swipe tests are performed randomly. None of the testing or monitoring detected any radiation leakage or exposure problems during 2005.

8.5 Air Quality and Protection Activities

The NETL Ambient Air Quality Management Program is concerned with protection of outdoor air quality. This includes the applications for air emissions permits that allow NETL to conduct research into the science of reducing air emissions. The program is regulated by the ACHD, which is authorized to administer Title V permits under the Clean Air Act Amendments.

The Federal air quality manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Air emissions are reported annually in accordance with the three air permits maintained at the site. One permit (#7032056-000-00500) is for a 4,500,000 Btu/hr Cleaver Brooks natural gas-fired boiler located inside Building 922. The second permit (#7032056-000-00501) is for three RayPak finned copper tube boilers, located inside Building 922, each having a 1,630,000 Btu/hr input rating. The third permit (#7023056-000-00800) is for the 500 lb/hr gas and coal-fired research unit located inside Building 86.



The site was designated as an administratively synthetic minor source by the ACHD, and this designation continued through 2005. A synthetic minor source is a source that accepts an emissions limit that allows it to remain outside of the Federal permit program. It is any source that has its emissions administratively limited below certain thresholds by means of a Federally enforceable order, rule, or permit condition. A synthetic minor source site pays a fee for the work involved in establishing the order, rule, or permit condition. After the synthetic minor source determination is complete, the source then becomes a registered source with the agency. An administratively synthetic minor source must have a completed application form; a written certification signed by a responsible official; a fee deposit sufficient to cover the estimated costs to the Division of Air Quality to review, evaluate, and act on the application; and submittal of sufficient information to ACHD. The designation provides interim permitting under Title V, pending final approval of the permit by ACHD.

This designation provides full compliance with Title V of the Clean Air Act. For the Pittsburgh site, three R&D combustion units follow operating requirements as outlined in the Title V application submitted to Allegheny County. Although not yet permitted under Title V, Allegheny County requires NETL to follow the limitations submitted in their application. NETL has never exceeded these operating limits.

The model used by the ACHD, Bureau of Environmental Quality, Division of Air Quality to calculate air emissions is based on fuel usage and provides worst-case emissions estimates. This model takes into account the type and quantity of the fuel and the total burn time of the fuel to determine the estimated emission level. The

results of this modeling are summarized in [Table 8.5.1](#). The 500-lb/hr Combustion Unit generates the largest single amount of emissions at the Pittsburgh site, while several other operations contribute a substantial amount of the remaining site emissions. These other sources include: the flexible Modular CO₂ Capture Facility (MCCF); Raypak boilers in Buildings 58, 84, 900, 920, 921, and 922; three Kewanee boilers in Building 84; unpaved roads (a source of particulates); and paved roads. The Combustion and Environmental Research Facility (CERF) was not operated during 2005 and is not included in these estimates.

NETL is not required to perform continuous air monitoring to determine emission levels and is in compliance with all permit requirements for the 500 lbs/hr Combustion Unit and for the boiler air emissions permits. There were no NOVs and no unplanned air emissions during 2005.

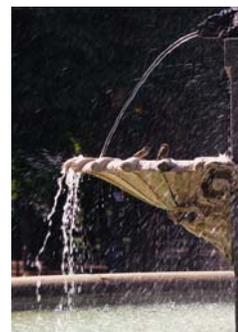
NETL actively participates in a program for a reduction in the use of Class I ODSs. This program aims to recover and reclaim chlorofluorocarbon refrigerants from HVAC equipment for subsequent reuse. The inventory of ODS-containing equipment on site is steadily decreasing. Older ODS-containing equipment is being replaced, and the use of Class I ODSs is being phased out for the HVAC equipment. For example, water fountains that contained Class I ODSs in their chiller units continued to be replaced across the site during 2005. Systems and appliances with environmentally-friendly substitutes are being used to replace the Class I ODS-containing systems and appliances.

The site maintains three 30-foot meteorological towers that monitor temperature, relative humidity, precipitation, wind speed, and wind direction. The towers are not used for emissions monitoring. Data are collected twice per week for use by the site's HVAC programs, for providing critical meteorological information to the ERO during emergency situations, and for providing meteorological information used in the models for the air emissions program.

8.6 Water Quality and Protection Activities

The topography of the NETL Pittsburgh site is comprised of rolling hills that separate the natural flow of water on the site. In addition, NETL has separated many of the activities performed on the site. Consequently, the surface water quality and protection program is essentially divided into two distinct areas. One area is located south of Wallace Road, and the other is located north of Experimental Drive. The northern area houses all of the laboratory and process facilities for the DOE portion of the site. The southern side primarily houses administrative, project management, and contractor maintenance operations.

The site is staffed by ES&H professionals who review site activities to ensure that the site does not contaminate storm water, industrial wastewater, or sanitary wastewater discharges. All onsite research projects and support activities are reviewed by ES&H staff, as part of the SARS process, for



possible impacts on air, surface water, groundwater, and soil. Applicable Federal, state, and local regulations potentially affecting these activities are reviewed, and compliance is ensured before approval to operate is given by the ES&H staff.

Laboratory wastewater from the northern area is routed to the WWTF located in Building 74. All treated industrial wastewater, which consists of laboratory and process wastewater from the site's R&D operations, is regulated by the Pleasant Hills Industrial Sewer Use Permit Program. Treatment in the WWTF consists of flow equalization with subsequent pH adjustment by adding caustic soda or ferric chloride. Metals and particulates are removed by agglomeration in the flocculation tank coupled with solids separation in the plate separator, and final removal of the metals and particulates occurs in the filter press. An activated clay/activated carbon filtration system provides additional removal of organics and metals from the treated wastewater prior to discharge into the sanitary sewer. The effluent can be recirculated from within the effluent monitoring tank immediately prior to discharge into the sanitary sewer. This recirculation is pH-driven. If the pH is outside the allowable range (between 6 and 9), a diverter valve automatically opens, which allows the off-specification treated effluent to be recirculated within the system for additional treatment until the pH has been brought back to within requirements. Final effluent pH adjustment occurs in a chamber inside the effluent monitoring tank prior to discharge into the sanitary sewer system. Treated industrial wastewater effluent from the site's WWTF is then routed to, and given final treatment in, the Pleasant Hills Sewage Treatment Plant.

The Pleasant Hills Authority (PHA) issued the current Industrial Sewer Use Permit to NETL on December 28, 2001. Conditions placed on NETL by the permit limit the quantity and quality of effluent constituents (free cyanide, phenolics, mercury, copper, chloroform, and pH) that may be discharged into the wastewater. The permit requires NETL to submit all wastewater analysis data for the treated wastewater effluent discharged through the WWTF to PHA's consulting engineering firm, Gannett Fleming, Inc., semiannually. [Table 8.6.1](#) contains the results of the 2005 monitoring. During this semiannual sampling, PHA conducts sampling and analysis independently. NETL also provides the PHA with the monthly sampling analysis at their request, although these data are not required by the permit.

In addition, NETL is required to prepare an annual wastewater report that contains no analytical data, but rather summarizes information about the site's industrial wastewater discharge, including the volume of wastewater discharged, the number of site employees, the type of waste discharged, and the type of pretreatment performed.

[Table 8.6.2](#) provides the industrial wastewater treatment facility effluent sampling results taken at the WWTF during 2005, including the monthly trichloromethane sample nonconformance (the nonconformance is indicated by shading). A notice of violation was not received from PHA for this permit limit nonconformance because trichloromethane levels in drinking water samples are usually higher than the industrial wastewater discharge limit.

The southern area does not have and does not need an industrial wastewater sewer system separate from the sanitary sewer system that drains to the Clairton (PA) plant, because there are no laboratory operations on the south side of the site.

NETL's sanitary sewage from the northern area is combined with sanitary sewage from the other major Federal agency on the site, CDC/NIOSH. This sanitary sewage discharge is separate from the discharge of the treated laboratory/process wastewater.

In addition to the sampling and analysis performed by NETL and CDC/NIOSH, PHA conducts independent sampling and analysis of wastewater effluent from all these locations. This information is used by the PHA to determine whether any discharges of the treated effluent were in excess of the local limits and required the issuance of a NOV.

MSHA, a minor Federal agency also located on the northern area, has a separate sanitary sewer line from the NETL and NIOSH sub-interceptor discharge that is located on the north side of the site. The MSHA sanitary sewer line discharges directly into the South Park (PA) main sanitary line. The NETL/NIOSH sub-interceptor sanitary sewer line also discharges into the South Park main sanitary line, but at a point much closer to the PHA WWTF.

All NETL sanitary sewage from the southern area is routed to, and treated in, the separate Clairton Municipal Sewage Treatment Plant.

Storm water (surface water) runoff from the 69-acre NETL northern portion of the site exits the site through the northern storm drainage system, a dedicated storm water system that drains directly into nearby Lick Run. This discharge occurs at the NPDES-permitted North Outfall (001). Lick Run is a small natural stream that flows along the eastern boundary of the 238-acre Bruceton Research Center. Contaminants to the storm water effluent are regulated by a NPDES storm water discharge permit. The contaminants consist of air conditioning condensate, runoff from various impervious surfaces into the site storm sewers, and treated acid-mine drainage from a research coal mine operated by CDC/NIOSH. There was a single reportable release into this permitted system during the year that required NETL to notify PADEP. This single reported release involved a fire line break on June 15, 2005 that released turbid water into Lick Run.

Storm water collected from the southern side of the site exits through the southern storm drainage system, a dedicated storm water system that enters Lick Run through the NETL NPDES-permitted South Outfall (002). NETL is required to monitor and report the results for the two site storm water discharge outfalls on a quarterly basis, although there are no discharge limits established for this discharge.

Storm water discharged from the northern side of the site is regulated through a NPDES permit issued to NETL, NIOSH, and MSHA. Storm water discharged from the southern side of the site is regulated through a NPDES permit issued to NETL only. [Table 8.6.3](#) provides the storm water North Outfall monitoring results for flow, suspended solids, carbonaceous biochemical oxygen demand 5-day test (CBOD5), oil and grease, aluminum, iron, manganese, lead, mercury, pH, and ammonia. There was a single sample analyzed on May 10, 2005 that exceeded the permit limit for

trichloromethane by a minimal amount (.0003 mg/L). [Table 8.6.3](#) also provides the storm water South Outfall monitoring results for flow, suspended solids, aluminum, iron, manganese, lead, pH, and ammonia.

8.7 Executive Orders

8.7.1 EO 13149 -- Greening Government through Federal Fleet and Transportation Efficiency

EO 13149 establishes a policy within the Federal Government that aims to ensure that the Federal Government exercises leadership in the reduction of petroleum (gasoline and diesel) consumption. The EO requires improvements in fleet fuel efficiency and increased use of alternative fuel vehicles (AFVs) and alternative fuels. The goals established by this EO and the results achieved in 2005 by NETL are:



- Reduce the entire vehicle fleet's annual total fuel (diesel and gasoline) consumption by at least 20% by the end of FY 2005, compared to FY 1999 levels:

NETL consumed 22,908 gallons of petroleum fuel through the vehicle fleet in 2005. In 1999 NETL consumed 29,602 gallons of total fuel. Thus, NETL realized a 10% reduction in petroleum fuel consumption.

- Increase the use of AFVs and alternative fuels to the extent practicable and consistent with the agency's mission. Hybrid electric vehicles should be considered by each agency. Each agency should fulfill the AFV acquisition requirements of Section 303 of the Energy Policy Act of 1992. NETL should acquire AFVs as 75% of total light duty vehicles. Alternative fuels should provide the majority of the fuel consumed in these vehicles by the end of FY 2005:

NETL consumed 12,373 gallons of alternative fuel compared to 22,908 gallons of petroleum fuel in 2005.

- Acquire conventional vehicles with higher fuel efficiencies so that the average EPA fuel economy rating of the NETL fleet of passenger cars and light trucks is reduced by at least 3 mpg by the end of FY 2005, compared to FY 1999 acquisitions:

The NETL vehicle fleet consumed 22,908 gallons of petroleum fuel in FY 2005 and traveled a total of 647,679 miles during that time. The resulting average fuel economy for FY 2005 was 24.37 miles per gallon. This compares to consumption of 29,602 gallons petroleum fuel in FY 1999 while traveling a total of 710,466 miles, which resulted in an average fuel economy of 24.00 miles per gallon.

NETL won an award from the Department of Energy, Office of Energy Efficiency and Renewable Energy, FreedomCAR and Vehicle Technologies (FCVT) Program for demonstrating leadership in reducing petroleum consumption in the Federal

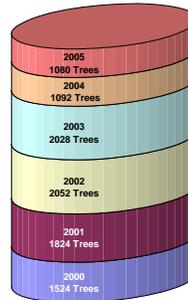
transportation sector and for exemplary performance towards achieving the goals of EO 13149.

8.7.2 EO 13101 -- Greening the Government Through Federal Acquisition

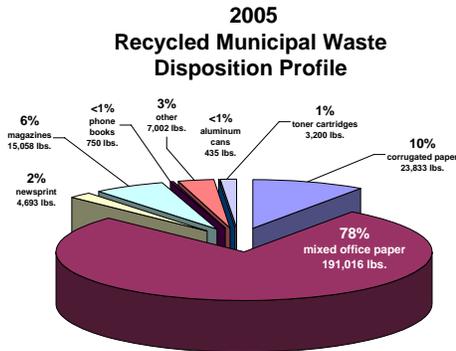
The recycling program as implemented in Morgantown consists of utilizing a site support services contractor (PACE Industries) for pickup and packaging of the recyclables. The offsite recycling vendor removes the recyclables from a central location and disposes of them via local recycling outlets. The present recycling vendor was engaged at the completion of a recycling vendor contract period. It was desirable to utilize the services of a vendor local to the Morgantown area if possible to support the local economy. The qualifications of the present vendor, Edwards Document Destruction & Recycling, were approved by the MGN recycling contracting officer's representative. The site pays for recyclables pickup on a per event basis.

The recycling program as implemented in Pittsburgh consists of utilizing a site support services contractor employee to periodically transfer the recycle bin contents to large cardboard boxes (gaylords) for pickup by the site's recycling vendor approximately once per month. Historically, the recycling vendors for the Pittsburgh site have been selected competitively on a yearly basis by issuing a bid package (in December) with the individual recycle streams (e. g., mixed paper, magazines, newspapers, and aluminum cans) listed with a space for the potential vendor to insert a dollar amount that they will pay the site for the recyclables. To date, two vendors have stopped picking up recyclables partway through the year. No vendors responded to the 2005 request for proposals. A vendor, Pittsburgh Recycling Services, was found after an extensive search. Unfortunately, the site pays for recyclables pickups and receives no money in return. This vendor will pick up #1 & #2 plastics, which some other vendors would not accept. In addition, hard cover textbooks and catalogs can be recycled rather than thrown away as was the case previously.

Trees Saved by Recycling NETL Paper Products
NETL saved 9600 trees since the year 2000



Pittsburgh has recently implemented a “recyclables sorting” effort that has added several metric tons (tonnes) of recyclables to the recycle stream while removing the same amount from the waste stream. Employees who are cleaning out offices because of retirement, relocation, or just as part of general housekeeping are provided with large, wheeled bins into which they can dump all their unwanted office supplies.



The bins are subsequently taken to the recycling building where appropriately trained support service contractor employees remove the recyclables from the bins for placement into the proper recyclable receptacles. On average, large bins containing approximately 200 – 350 pounds of unwanted office supplies usually contain approximately 30 – 50 pounds of unrecyclable trash.

8.7.3 EO 13123 -- Greening the Government through Efficient Energy Management

NETL has been challenged to demonstrate efficient energy management leadership through our role in DOE. This challenge is made difficult by the age of many of the facilities and systems used on the site. These facilities and systems were constructed using inefficient materials at a time when energy conservation was not a priority. Despite this handicap, NETL is aggressively pursuing the most energy efficient management of facilities possible. For example, lighting retrofits are now a routine part of all construction/renovation packages in which inefficient fixtures are replaced with more efficient 277-volt Energy Star-rated electronic ballast fluorescent fixtures. Motion sensors have been installed to conserve energy in areas without constant use. NETL has incorporated energy efficient designs and Energy Star equipment into construction, remodeling, and maintenance projects. The 2005 Energy and Utilities Management Performance Agreement includes the following seven energy management performance objectives: (1) administer energy management initiatives consistent with the comprehensive Energy Management Plan; (2) meet the FY 2005 energy reduction goal of 20 percent per square foot in laboratory and industrial facilities compared to a 1990 baseline; (3) develop and implement water efficiency programs and plans; (4) evaluate and attempt to qualify office buildings for receipt of the Energy Star building label by December 31, 2004; (5) increase the number of energy management retrofit projects that are funded and completed on site; (6) increase the use of off-grid generated electricity; and (7) plan for and ensure the efficient and economical acquisition, management, and use of energy and utilities.

Consistent with this EO, NETL developed a Comprehensive Energy Management Plan that establishes the strategy and annual implementation steps for compliance. The plan includes the requirements of DOE O 430.2a and an energy curtailment plan (for use in the event of emergencies). As a part of the decision-making about whether to undertake certain projects and investments, NETL undertakes life-cycle cost analyses. These analyses have been used primarily for equipment replacement

projects, especially HVAC system replacements. Often, these analyses indicate the optimal time to undertake a retrofit project during the life span of equipment or facilities. To further guide the decisions about priorities for energy efficiency improvements to the infrastructure, NETL, during fiscal year renovations, conducts specific construction project energy audits.



NETL classifies all of its facilities at the Morgantown, WV site and the Pittsburgh, PA site as industrial buildings and laboratories. During FY 2005, NETL has achieved the EO goals of a 20 percent reduction in energy consumption per square foot in laboratory and industrial (mixed use) facilities. During the base year (1990), energy use was 369,000 Btu/sq.ft. During FY 2005, energy use was 205,340 Btu/sq.ft., a reduction of 44.35

percent.

NETL also attempted to reduce the greenhouse gas emissions that could be attributed to the energy use at its facilities. The EO goal is a 25 percent reduction in greenhouse gas emissions compared to 1990 levels by 2005, and a 30 percent reduction by 2010. During 1990, greenhouse gas emissions were 66,740,000 lbs of CO₂. During 2005, greenhouse gas emissions were 51,000,000 lbs of CO₂. This is a reduction of 23.58%. Although NETL did not meet the greenhouse gas reduction goal of 25% in 2005, it is expected that the FY 2010 goal of 30% reduction will be met. The greenhouse gas reduction that has been achieved is primarily due to reductions in energy (electricity, natural gas, and steam) usage. Additional reductions in emissions have come from the purchase of electricity generated from renewable resources via NETL's utility providers (i.e., captured methane gas, geothermal, solid waste, water, wind, and biomass). During FY2005 NETL purchased 786 megawatt-hours of electricity from renewable sources. A significant reduction in greenhouse gas emissions has been achieved due to the NETL-Pittsburgh campus purchasing 100% of its natural gas needs from a local landfill. The U.S. DOE Federal Energy Management Program has identified NETL's landfill gas usage as a renewable energy source. No renewable energy was generated on either of NETL's sites (Morgantown or Pittsburgh) during 2005.

NETL has made efforts to reduce its consumption of petroleum products (oil, gasoline, diesel fuel, LPG, and propane), primarily through the use of ethanol and natural gas in alternative-fueled vehicles. Ordinarily, NETL does not use petroleum products for heating buildings. Only forklifts, front-end loaders, snow-removal equipment, and lawn care equipment are fueled with gasoline or diesel fuel. An ethanol tank and dispensing system has been installed at both the NETL campuses in Morgantown, WV and Pittsburgh, PA to support compliance with this EO.

The NETL Pittsburgh Childcare Facility is pursuing LEED certification during 2005.

NETL's Building 94 Energy Management Retrofit Project, a co-funded NETL/FEMP (Federal Energy Management Program) project, is continuing. This energy management retrofit project, which was cost shared between FEMP and NETL, involves upgrading one of NETL's analytical chemistry buildings. The Building 94 Energy Management Retrofit Project integrates six energy conservation measures into the building upgrade. They include: expansion of the building management system; upgrade of laboratory hoods and installation of laboratory hood controls; installation of variable speed drives on supply air fans; decommissioning of the makeup air system; replacement of two 225-ton Class I CFC chillers with two high efficiency CFC-free 167-ton chillers; and replacement of existing fluorescent fixtures with high efficiency 3-tube T-8 fluorescent fixtures.



When completed, the 51,823 square foot Building 94 will provide an annual energy and cost savings of 8,200 MBtu and \$80,000, respectively. The design/construction schedule for this project has encompassed FY 2002 through 2005 and should be completed in FY 2007. FY 2005 activities included: final installation and operation of the 2 new 167-ton CFC-free chillers; operation of penthouse-located variable speed drive supply air fans; operation of the penthouse-located variable speed drive chilled water pumps; continued expansion of the building management system; continued installation of the expanded roof penthouse; installation of the high efficiency natural gas fired multi-stage boilers (replacing a landlord-supplied coal-fired steam heating system); and demolition and removal of the existing Class I CFC R-11 basement-located chillers and reclaiming of the R-11 refrigerant with subsequent shipment to a DOD reclaiming facility. Future out-year work will include: continued upgrade of the building management system; continued retrofit of laboratory hoods with purchase and installation of laboratory hood controls; continued installation of building management laboratory and office controls; purchase and installation of energy efficient 3-tube T-8 electronic ballast fluorescent fixtures; and purchase and installation of occupancy sensors in less used areas (conference rooms, copy centers, and restrooms) which control both lighting and supply air.

During FY 2005, NETL-Pittsburgh began operation of its fast-fill Compressed Natural Gas (CNG) Facility for on site fueling of our natural gas vehicular fleet. The fast-fill CNG facility is tied into our site natural gas system supply, 100% of which is landfill gas, which is identified by FEMP as a renewable energy source. This facility assists NETL in meeting the objectives of the Executive Order 13123, Greening the Government through Efficient Energy Management.

8.8 Groundwater, Soil Quality, and Protection Activities

The PGH -National Energy Technology Laboratory (see Figure 8.8.1) is located within the Appalachian Plateau physiographic province. The topography, consisting

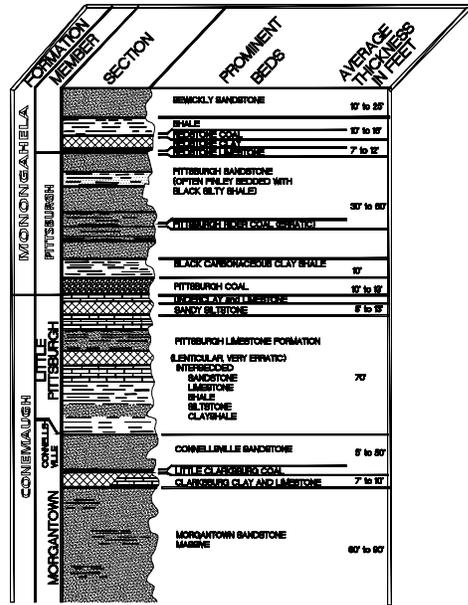


Figure 8.8.2 General Geologic Column

The Monongahela Group forms the tops of the hills on the site and consists of cyclic and interfingering sequences of shale, limestone, sandstone, and coal. Two prominent coal beds, the Redstone Coal and the Pittsburgh Coal, outcrop onsite. The Pittsburgh Coal, however, has been heavily mined and very little remains. The resultant mine voids and their possible effect on groundwater are subsequently discussed.

The Conemaugh Group is exposed lower on the hills and in the valleys of the site. The upper member of this group is the Casselman Formation and consists of thinly bedded limestone interbedded with calcareous, variegated shales and sandstone.

In the Pittsburgh geologic quadrangle, there are two major anticlines and two major synclines. The axis of one of the anticlines, the Amity Anticline, trends northeast to southwest and passes just southeast of NETL. As a result, rock units under the site dip gently to the northwest at about a 10° angle. Locally, minor folding and faulting also occur.

Groundwater in the region is known to occur in unconsolidated deposits in stream valleys and in fractures, pore spaces, bedding planes, and solution channels in consolidated rock layers. No water-bearing zones have been encountered in overburden soils during previous drilling on DOE property.

The shallowest aquifer on NETL property is found in the weathered bedrock just below the rock/soil contact and occurs over most of the site, except where it is undermined. Recharge of this unit occurs where rainfall percolates downward into the weathered strata until a continuous horizon of low vertical permeability (unweathered bedrock) is encountered. There are a total of 19 wells screened in

shallow weathered bedrock; 7 are located in the Main Plateau area and 12 are in the Valley Fill area. [Figure 8.8.3](#) and [Figure 8.8.4](#) contain the locations of the monitoring wells.

A deeper, water-bearing zone has been noted at NETL at the contact between the Connellsville Sandstone and the Clarksburg Clay and Limestone. There are a total of 4 wells screened in this deeper zone (located in the Main Plateau area). This deeper aquifer had extremely low yield in the Valley Fill area.

Four wells (2 at the Main Plateau and 2 in the Valley Fill area) were originally screened in the depth interval between the two aquifers, within fractured strata. These wells had extremely low yields and were subsequently abandoned. The minimal amount of groundwater occurring in this intermediate zone is probably the result of leakage from the overlying shallow, weathered bedrock zone.

The Pittsburgh Limestone, with its interbedded shales, is generally impermeable except where weathered, fractured, or where bedding plane separations have been formed by solution. Onsite monitoring wells installed in the Pittsburgh Limestone formation have had highly variable water production. Weathered or fractured portions of this unit have been capable of supporting submersible pumps, and a spring emanating from a limestone outcrop in the bed of McElhaney Creek flows freely and constantly year round. Conversely, where the unit is unweathered or exhibits poorly developed fracture zones, yields have been very poor.

Although the Connellsville Sandstone has been reported to yield up to 25 gallons per minute in some southern portions of Allegheny County, previous on-site drilling into the upper Connellsville revealed it to be shaley and relatively unproductive at NETL. However, the lower Connellsville at the contact with the Clarksburg group was very fractured and at some locations exhibited water-filled voids.

The Lick Run valley, which borders the eastern edge of NETL, is made up of silt and sand alluvial deposits. The alluvial deposits comprise a water-bearing unit, which discharges to form the stream baseflow within Lick Run. Although shallow piezometers have been established in these deposits, the thickness of this water-bearing unit is unknown.

The vast majority of domestic water supplies for the area surrounding the NETL site are provided by the Pennsylvania American Water Company, which processes water from the Monongahela River. There was, however, at least one groundwater well listed for domestic usage within a one-mile radius of NETL. This well, situated near central Bruceton, was 140 feet deep and was completed in the Monongahela Group, according to the computerized PADEP Water Well Inventory (as of 2006). Upon topographic review of the well's location based on reported longitude and latitude, it was possible that this well was in fact completed in the Conemaugh Group due to the reported depth of the well. The well is located to the north of NETL, so it should not be affected by NETL groundwater impacts because groundwater is assumed to flow

in a southerly direction beneath the Lick Run valley. There has been a report of a domestic water well on Piney Fork Road (approximately 1-1/2 miles south of NETL), but this well could not be located or confirmed by preliminary physical exploration and was not included on the Water Well Inventory.

The PADEP Water Well Inventory reported no other domestic wells in Jefferson Borough or South Park Township. It should be noted, however, that the inventory does not list those wells that may have been drilled prior to 1966.

There are two groundwater flow patterns at NETL. Groundwater flowing in the shallow, weathered bedrock aquifer may percolate along the soil/bedrock interface and/or along near-vertical stress relief fractures and follows the general site topography, flowing from the tops of hills on the site, generally perpendicular to ground surface elevation contours. This flow is directed by the intervening valleys toward the Lick Run valley, where it joins the water-bearing unit located in the valley and adds to the base flow of Lick Run itself. Some of this flow also discharges as springs on the hillsides or in the valleys.



The second flow pattern is associated with the deeper aquifer. Groundwater in this zone generally flows east towards the Lick Run Valley, where it commingles with water of the shallow zone as it flows off the hillsides.

The Pittsburgh Coal seam outcrops throughout the NETL site and underlies a small portion of DOE property, particularly the Building 167 area. The coal outcrop can be seen in the hillside above the Main Plateau area. The 900 and 920 areas are built on fill very near to where the coal probably outcropped, but the seam probably has been removed by crop mining or stripping during construction.

The Pittsburgh Coal has been extensively mined since the beginning of the 20th Century, and is mined out in the area, except for remaining roof support pillars and a small working portion of the on-site Experimental Mine. The coal seam, as with the other strata, dips to the northwest at an approximate 10° angle. Near the eastern boundaries of the site, the top of coal is located at an elevation ranging from 1015 to 1020 feet above mean sea level. The dip is such that the top of coal is found near 990 feet at the western end of the site.

The coal seam and associated mine workings have influence on groundwater at those locations underlain by them. Fracturing of overlying strata and actual roof collapse has created conduits that act to dewater the overlying rock. This is the case at Building 167 (and the adjacent Triangle Parking Lot); where the shallow, weathered bedrock zone was dry. Also, the voids created during mining leave open conduits that allow water to flow down freely, possibly exiting at old portals. Mining may have removed underlying fireclays usually associated with the bottom of coal seams,

opening up the possibility for downward migration of water into the underlying rock. For these reasons, special attention will have to be paid to the coal seam and its relative position to areas of investigation.

The Groundwater Monitoring Program (GMP) primarily will have as its objective the monitoring of the shallow, weathered bedrock zone as the first significant aquifer or water-bearing unit beneath the NETL facilities. Contamination entering the ground from soil surface sources would be expected to impact this zone first and foremost; hence the majority of wells are placed in this zone. The GMP will also monitor the wells screened in the deeper water-bearing zone in order to provide data on water quality and contaminant migration (if any).

Another goal of the monitoring program is to identify and characterize groundwater flow, and relate it to surface water flow conditions, in order to better evaluate potential environmental effects of any groundwater contamination.

By properly determining and characterizing local groundwater conditions, it should be possible to ensure that potential contamination and potential contaminant migration routes are suitably identified and investigated. This should enable sources of potential continuing contamination to be characterized (and to remediate if warranted).

The 2005 groundwater monitoring was performed according to the NETL-PGH 2005 Groundwater Detection Monitoring Plan (NETL controlled document #: NP001.0804.0271.2001.1.00.0). The NETL-PGH Monitoring Wells Locations are located in Attachment A. To fulfill a Pennsylvania Department of Environmental Protection storage tank closure request, seven wells were monitored for total petroleum hydrocarbons – diesel range organics in 2005. The eighth well, VFW-9, was under the process of modification due to construction in the area. The results of the NETL-PGH Groundwater Detection Monitoring Program are presented in [Table 8.8.5](#). The results were compared against federal and state standards for groundwater. No standards were exceeded.

Statistical analysis was conducted on two indicators of groundwater contamination (pH and specific conductance) for seven of the NETL-PGH Valley Filled Groundwater Monitoring Wells in the 2005 monitoring data. The analysis compared the up gradient wells to the down gradient wells. The up gradient wells are VFW-2 and VFW-10. The results of the statistical analysis for pH showed that, for the tolerance interval-two tailed method, no wells were outside of the background tolerance intervals. The results of the statistical analysis for specific conductance showed that, for the tolerance interval-two tailed method, Wells VFW-2 and VFW-7 were outside the background tolerance limit.

Monthly groundwater elevation measurements to determine contaminant transport were completed in accordance with the Groundwater Protection Management

Program. The elevations are consistent with the general groundwater flow patterns described previously.

An element of the Groundwater Detection Program is the surface water - groundwater interaction. A piezometer was monitored eleven times in 2005 along Lick Run upstream of the site and a piezometer was monitored weekly along Lick Run adjacent to the site to determine if Lick Run is a "gaining" or "losing" stream. A "gaining" stream has groundwater flowing to the stream, while a "losing" stream has surface water flowing to the groundwater. The data collected indicates that Lick Run upstream of the site is a "gaining" stream for ten out of the twelve months, while Lick Run adjacent to the site is always a "gaining" stream.

9.0 ALBANY

9.1 Site Description

NETL-Albany (formerly the Albany Research Center) is a U.S. Department of Energy materials research laboratory located in Albany, Oregon. Researchers address fundamental mechanisms and processes; melt, cast, and fabricate up to one ton of materials; completely characterize the chemical and physical properties of materials; and deal with the waste and by-products of materials processes. For more than half a century, the site has established recognized expertise and capabilities in wear and corrosion, melting and casting, and in materials development.



NETL-Albany was established as the Albany Research Center on June 2, 1942, as part of the U.S. Bureau of Mines. Its purpose was twofold: (1) to find methods for using the abundant low-grade resources of the area, and (2) to develop new metallurgical processes using electrical energy. It was known then as the Northwest Electro-development Laboratory. The 42-acre campus of the recently vacated Albany College was chosen to house the research facilities.

During the early years, one of the Albany Research Center's landmark achievements was a process for producing zirconium. Dr. William J. Kroll, an eminent scientist from Luxembourg, played a major role in formulating the research program at the Albany Research Center. It was his work on the lesser known reactive metals that led to the birth of both the titanium and zirconium industries, which employ processes that bear his name. In 1948, zirconium was chosen for use in the reactor of the first nuclear-powered submarine, the U. S. S. Nautilus. The Center produced the metal for the submarine in collaboration with the U.S. Navy and the Atomic Energy Commission.

In 1985, the Center was named an historical landmark by the American Society for Metals.

In 1995, Congress closed the U.S. Bureau of Mines, but the Materials Partnership Program at the Albany Research Center was transferred into the Office of Fossil

Energy of the U.S. Department of Energy. On November 27, 2005 the Albany Research Center became part of the National Energy Technology Laboratory.

In recent years, the site has become a key participant in DOE's Vision 21 and FutureGen initiatives, working on issues involving the durability and strength of key materials for high-efficiency power systems. Center researchers are also involved in developing high-strength, lower weight structural components for future automobiles. Researchers are also conducting potential breakthrough experiments in carbon sequestration, concentrating their skills on techniques that capture CO₂, a greenhouse gas, and convert it into a solid mineral form.

Currently, approximately 81 federal employees work at the site. Operations at the site do not impact surrounding buildings or neighborhoods. There are seven buildings on the site which are listed for protection in the National Historic Register.

9.2 Major Site Activities

NETL-Albany conducts many research and development activities. Two of the principal research activities at the site, refractory material issues in gasifiers and concepts to improve sequestration by mineral carbonation, are discussed below.

Refractory Material Issues in Gasifiers - Gasification is an efficient and environmentally sound way to use coal or other carbonaceous matter in the production of power, steam, or even hydrogen. It also provides a waste CO₂ stream which is easily isolated for sequestration. One of the byproducts from this process is molten slag, which can damage the refractory or lining material in gasifiers. Researchers will evaluate different refractory materials and thermocouple designs to reduce the corrosive and damaging effect of molten slag. This project has a total value of \$2.29 million and is funded entirely by DOE.

Concepts to Improve Sequestration by Mineral Carbonation - This project complements the previously awarded mineral-carbonation project by examining concepts that may lead to improved reaction kinetics and the extent of reaction. This \$400,000 project is funded entirely by DOE.

10.0 COMPLIANCE STATUS

10.1 Environmental Restoration and Waste Management

10.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Albany site had no offsite remediation activities that were ongoing during 2005, and there were no National Priorities List (NPL) sites for which they had liability under CERCLA/SARA.

10.1.2 SARA Title III

The Albany site does not use, produce, process, or store hazardous materials in excess of threshold quantities that would trigger EPCRA reporting. Therefore TRI reporting (Sec. 313) is not necessary. However, emergency response planning has been implemented at the site. A chemical inventory and MSDS database are maintained to aid in the efficient use and storage of chemicals and for worker safety and knowledge. In 2005, the Albany site had a chemical stand-down to reduce the amount of unused and unneeded chemicals and related materials. As a result of that action, 4,484 lbs of hazardous materials were identified for reuse or disposal, and 24,054 lbs of non-hazardous materials were identified.

There were no onsite CERCLA/SARA cleanups at the Albany site in 2005. There were no releases that would trigger reporting to DOE Headquarters Emergency Operations Center, the U.S. Coast Guard National Response Center, or any other governmental agency.

10.1.3 RCRA Cleanups.

In 2005, there were no spills or leaks from facilities, operations, or other activities that would lead to RCRA cleanups. There were also no cleanups or surveillance activities for leaks or spills that occurred in prior years.

10.2 National Environmental Policy Act

NETL-Pittsburgh conducts NEPA reviews for proposed offsite federal actions proposed by activities at NETL-Albany. These actions relate to contract awards or grants to other governmental organizations, educational institutions, and private industry. Project managers complete questionnaires regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. There are no NEPA compliance officers at the Albany site. In 2005, all funded projects were determined to fall within the realm of categorical exclusions.

10.3 TSCA

The staff at NETL-Albany is not aware of any spills or releases of TSCA-regulated substances (e.g., pesticides, PCBs, formaldehyde, methylene chloride, asbestos).

10.4 Radiation Protection

10.4.1 Ionizing Radiation Program.

There are only x-ray generating devices used for analytical applications at the Albany site. These include scanning and transmission electron microscopes, x-ray diffraction and fluorescence instruments, and a particle size analyzer. All are examined once a year for leaks and safety controls to insure employee safety. A dosimetry program has also been initiated to check for employee exposures. No sealed sources are located at

the site. No radioactive materials are brought to the site, although a few legacy items have been stored in a decommissioned Co-60 hot cell awaiting disposal.

10.4.2 Laser Program.

The Albany office has Class I lasers in common office devices such as laser pointers, CD readers within PCs, and fiber-optic communications lines. These lasers are built into devices that protect the consumer through engineering design. Staff members may also have laser pointers that are either Class II or Class III, commonly used by speakers during lectures and presentations. A laser safety program has not been implemented at the Albany site and is currently viewed as unnecessary.



10.5 Air Quality and Protection

Albany has no air quality protection program and no emissions that require monitoring, reporting, or permitting. In 2005 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the Albany site. Operation of the Albany site does not contribute significantly to any violations of National Ambient Air Quality Standards (NAAQS). There are no Albany office facilities or projects that are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAPS) Program – Albany office facilities and projects do not have the potential to emit more than 10 tons-per-year of a single designated toxic air pollutant or more than 25 tons-per-year in aggregate of all toxic air pollutants, nor are any facilities or projects regulated for any of the 189 toxic air pollutants.

Ozone-depleting refrigerants are used for air conditioning, refrigeration, and chilling. There are no plans or activities to completely phase-out of ODSs at the site, but they are replaced with more environmentally friendly units as the need arises and funding becomes available.

10.6 Water Quality and Protection Activities

NETL-Albany holds a wastewater discharge permit with the City of Albany through 2006, at which time an application for renewal will be submitted. The permit is renewed on a 4-year cycle. Also filed with the City is a slug discharge control plan that must be renewed every 2 years. No storm water permit is held by NETL-Albany, since regulation is augmented by the City of Albany through the wastewater permit. Albany site activities in 2005 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

In 2005, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards, since all potable water is supplied by a local vender in 5-gallon quantities. This water is provided due to the aging water

delivery pipes in most buildings at the site. The water supply for NETL-Albany comes from the municipal water distribution network and is used for all applications except drinking.

10.7 Executive Orders (EO) and DOE Orders

10.7.1 EO 13149, Greening the Government through Federal Fleet and Transportation Efficiency.

This EO aims to ensure that the federal government exercises leadership in the reduction of petroleum consumption through improvements in fleet fuel efficiency and the use of alternative fuels in alternative fuel vehicles. The Albany office has three vehicles that are owned by GSA. One van is E85-compatible, but no E85 fuel supplies are available locally. The pickup truck is capable of using either compressed natural gas (CNG) or gasoline. NETL-Albany has an on-site slow-fill CNG station for fueling the pickup truck. The vehicles are included in the NETL statistics that are reported to DOE.

10.7.2 EO 13148, Greening the Government through Leadership in Environmental Management.

This EO requires NETL-Albany to ensure that all necessary actions are taken to integrate environmental accountability into day-to-day decision-making and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of NETL-Albany policies, operations, planning, and management. NETL-Albany achieves this requirement through development and implementation of its environmental management system, which is called the Albany Management System (AMS). Through the AMS, NETL-Albany ensures that strategies are established to support environmental leadership programs, policies, and procedures, and that senior level managers explicitly and actively endorse these strategies. What follows is a chronological accounting of the progress made by NETL-Albany in meeting the requirements of this EO

FY04

The site's consistent method of operation, the AMS, which focuses on the primary business activity of the site, was the basis for implementing all requirements to document, improve efficiencies, and meet new regulatory/directive guidelines for our operations. Although the AMS had existed as individual processes, no complete system had ever been formalized or documented. The management at the site therefore decided to formalize the Albany Management System (AMS).

The AMS defines the processes that are used at NETL-Albany to fulfill its mission: conducting research and providing solutions for making our Nation's energy systems safe, efficient, and secure. Processes that obtain information about customer and stakeholder needs translate those needs into requirements for NETL-Albany's research, ensure resources and controls for performing research, strive to deliver the

highest quality goods and services, obtain payment for the products delivered, and are all captured within the AMS. The AMS also addresses the requirements of controlling the impact of the site's operations on the environment, the health and safety of the site's employees, and the local community.

The AMS is an integrated management system, which means that rather than having a separate environmental system, safety system, or any other system requirements requested by its stakeholders, there is a single system which incorporates all requirements. The results of such a system are that meeting these requirements is made a normal part of conducting operations, rather than simply added tasks. The improved efficiency provides superior value to the citizens of this country, who fund the operations to seek solutions for making our Nation's energy systems safe, efficient, and secure.

With the AMS formally documented, Albany staff began to focus on any gaps between the AMS system requirements and the system requirements of ISO 14001. As the site had been initiating efforts on elements of ISO 14001 that were clearly missing from standard operations (e.g., specific environmental management programs) in parallel with formalizing the AMS, the foundations of the system were in place. Accordingly, efforts centered on improving implementation and efficiency of the existing system.

FY05

The greatest system improvements were in electronic information dissemination. The most notable changes were:

- 1) Implementing a common interface for handling employee training and chemical inventory databases which can be expanded to meet other system needs. Any employee can easily check the databases from a desktop application to see what training has been completed, is required, or is scheduled, or what chemicals are assigned to that individual. This makes it easier for employees to meet their job requirements and for managers to quickly evaluate developmental needs and determine the job and environmental hazards faced by any employee or for the site and community as a whole.
- 2) Establishing electronic delivery of both standard operating procedures (SOP) and material safety data sheets (MSDS), which previously had been kept as hard copies in binders. By providing electronic delivery, the efforts needed to maintain currency were dramatically reduced, and employees could more quickly find the information they needed.

The next major environmental initiative was in chemical inventory. During the week of July 11-15, 2005, the site conducted a stand-down. The objective of the stand-down was to minimize safety, health, and environmental risks associated with chemicals at the site. The effort focused on ensuring that



all chemicals, research products, and commercial products used in performing research and/or maintaining the site were properly labeled, inventoried, and stored. In addition to the full participation of staff, additional contractor support having expertise in chemical hazards, disposal, and inventory was supplied by NETL.

The following metrics were identified in advance to measure the success of the stand down:

- 100% coverage of the site: That is, 100% of the square footage that is available and useable as storage for chemicals and/or materials to be physically checked.
- A reconciliation of the inventory of all chemicals on site was performed.
- Training and understanding of chemical handling safety and on the beryllium policy and area usage.

The morning of July 11, 2005, was devoted to training. Courses provided were Chemical Handling Safety (10 CFR 1910.120), Beryllium Awareness, and a review and discussion of the site's Beryllium Policy (ARC-PO-500.4). The remainder of the week was spent in reviewing the contents of every drawer and shelf in every room categorized as being an unrestricted area, and labeling, storing, or disposing of contents as appropriate. A total of more than 3,000 man-hours were spent on this exercise in which more than 2,600 items were identified and collected for disposal. Changes to the site's chemical inventory were completed, research products with no additional utility were removed for recycling or disposal, as appropriate, and useful commercial products were consolidated. All of this was done with no lost man-hours due to injury or illness.

During the stand-down, the staff made considerable progress in reducing the quantities of EO 13148 priority toxics. Of special note is that the remaining stock of cadmium is negligible, and only a few items containing ozone-depleting substances were found, both evidence of the success of previous efforts. Hazardous chemicals such as beryllium (mainly in inert forms or ores), arsenic, and low level radioactive materials (largely thallium and uranium compounds and ores) were removed for disposal. Only a few minor items containing asbestos were collected, again attesting to the success of previous efforts.

The Albany Research Center was certified to the ISO 14001:1996 standard on 11/30/2005. The Center had been ready to be assessed against the more current 2004 standard at the time of the certification, but was informed that the infrastructure for auditing against the more current standard was not yet fully in place.



10.7.3 EO 13123 -- Greening the Government through Efficient Energy Management.

This EO mandates a comprehensive effort to reduce energy consumption by federal facilities. For example, it aims to reduce greenhouse gas emissions attributed to federal facility energy use by 30 percent by 2010, compared to emission levels in 1990.

For NETL-Albany, electricity costs are included in overall utility costs. In the main administrative building (Building 1) at NETL-Albany, lights and air conditioning are governed by a building energy management system that uses timers which are on between 6:00 am and 6:00 pm, and sets back temperatures at night, on weekends, and on holidays. Energy efficient lighting has replaced conventional bulbs in many areas on center, and the staff buys Energy Star products when the opportunity arises. Although there is no formal energy efficiency training in place for the staff, they are involved in receiving informal education and by using containers for recyclables in their offices.

10.7.4 EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.

EO 13101 establishes a general approach and goals for affirmative procurement and recycling activities by federal agencies. The Albany site participates in a recycling program. Receptacles are provided for the collection of waste office paper and aluminum cans throughout the facility. Various scrap materials from building maintenance are also sent to recycling.

Affirmative procurement means the purchase of goods and services that have a less adverse impact on the environment throughout their lifecycle and that are reasonable for the government to purchase. The Albany office purchases refilled toner cartridges and office paper made with recycled materials.

NETL-Albany utilizes the NETL Small Purchase System (SPS) to buy supplies. This system further encourages affirmative procurement. Individuals who regularly purchase items are instructed to give preference to the purchase of items with recycled content.

10.7.5 DOE Order 435.1, Radioactive Waste Management.

The small amount of radioactive waste on the site is a result of historic operations and is managed under the program described above in [Section 10.4 Radiation Protection](#).

10.8 Groundwater and Soil Quality Protection Activities

In 2001, NETL-Albany initiated a groundwater protection and monitoring program in accordance with DOE requirements. The program continues to be a voluntary effort which follows the Oregon Department of



Environmental Quality (DEQ) Independent Cleanup Program, with regulatory input. NETL-Albany installed 14 monitoring wells (see [Figure 10.8](#) for well locations) on-site in July 2002 and sampled the wells for a broad range of contaminants, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, nitrates, and polychlorinated biphenyls (PCBs) from all 14 wells and screened for pesticides, herbicides, dioxins, and radiological constituents from a selected subset of the wells. Initial periodic sampling showed concern over elevated levels of VOCs, metals, and radiological constituents. Concern about excessive turbidity of samples that could have directly influenced metals and radiological results resulted in a review of sampling protocols. This review resulted in a resampling using U.S. EPA low-stress protocols for collecting groundwater samples. This resulted in metal and radiological contaminant levels in groundwater found to be at or near background levels for the Willamette Valley, Oregon.

VOC detections during periodic monitoring prompted NETL-Albany to further investigate areas of suspected contamination, with planning efforts starting in September 2004 and on-site work initiated in late January 2005. Results from samples taken in February 2005 showed contaminants of potential concern (COPCs) were likely crossing the eastern boundary of the site and migrating toward Liberty Elementary School. After meeting with Oregon DEQ and the Greater Albany Public Schools (GAPS) District personnel, actions were taken to perform site investigations onsite and offsite during March-December 2005. Results of the site investigation showed no concern over surface soils, subsurface soils, soil gas, or ambient air at offsite properties. The only concern identified was with elevated levels of COPCs in groundwater, including trichloroethene (TCE), carbon tetrachloride, and chloroform.

Oregon DEQ initiated sampling of residential wells within an approximate two (2)-block radius of the site due to concerns of residents voiced at town hall meetings and further reviews of the sampling results. A total of 31 residential wells were sampled, with some residential wells (including some used as drinking water) showing elevated levels of COPCs. All of the owners of wells used as drinking water were provided bottled water, and NETL is currently pursuing hooking those residences up to City of Albany water.

NETL-Albany is continuing its site investigation activities and remedial actions in accordance with Oregon DEQ requirements and will pursue actions to protect human health and the environment by eliminating risk and minimizing potential exposures.

10.9 Other Major Environmental Issues and Actions

Compliance with 10 CFR 850. Albany has developed a program based on 10 CFR 850 to comply with the objectives of a chronic beryllium disease prevention program (CBDPP). The program plan was issued in October 2005. This is because beryllium was identified in various locations throughout the site. Remedial action planning is occurring while protective health measures have been instituted. NETL-Albany was also involved with testing for suspected contamination as described in [Section 4.7](#).

11.0 TULSA

11.1 Site Description



The Tulsa office, having no laboratory facilities, does not engage in the same compliance assessment processes as the Morgantown, Pittsburgh, or Albany sites. Because building and facility operations and maintenance are under the control of the landlord, the Tulsa office itself has to comply with few ES&H regulations. Therefore, the Tulsa office does not undertake in-house audits, external audits, or subject matter reviews, and regulatory agencies do not conduct ES&H inspections or investigations of activities. However, in-house inspections and regulatory agency inspections (e.g., by the local fire marshal or municipal building inspectors) of the building and facilities could occur, with any subsequent findings assessed against the landlord.

Building occupants participate in fire drills, which are conducted according to local fire marshal requirements and in cooperation with the building management. Volunteer fire wardens conduct roll calls during drills and facilitate orderly evacuations. Tornado drills are announced through a building-wide public address system and are conducted in accordance with Occupational Safety and Health Administration emergency response requirements.

The city of Tulsa does not impose recycling requirements that would apply directly to office space lessees. Nevertheless, building management has arranged for various recycling activities throughout the office building complex.

There were no citations for violations of ES&H laws, regulations, or ordinances in 2005.

11.2 Major Site Activities

All facilities of the NETL office in Tulsa are located in The Williams Center, a downtown office building complex. The offices are leased by NETL-Tulsa from the Southwestern Power Administration (SWPA). In 2005, the Tulsa office undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the offices.

12.0 COMPLIANCE STATUS

12.1 Environmental Restoration and Waste Management

The Tulsa office had no offsite remediation activities, no onsite CERCLA/SARA cleanups, and no spills or leaks from facilities or operations that were ongoing during 2005. There were no National Priorities List (NPL) sites for which NETL had liability under CERCLA/SARA. There were no cleanups or surveillance activities for leaks or spills that occurred in prior years or other activities that would lead to RCRA cleanups.

NETL-Tulsa does not have a program to deal with hazardous waste; however, building management does recycle some RCRA universal (semi-hazardous) waste materials. They also provide pickup and handling services for the disposal or recycling of dry-cell batteries, fluorescent light bulbs, and light ballasts.

12.2 National Environmental Policy Act

NETL-Tulsa conducts NEPA reviews for proposed offsite federal actions. These actions relate to contract awards or grants to other governmental organizations, educational institutions, and private industry. Project managers complete questionnaires regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. The completed forms are evaluated by the two NEPA compliance officers at the Tulsa office for a determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2005, all funded projects were determined to be categorical exclusions. There were 11 NEPA reviews that resulted in categorical exclusions. The Tulsa office NEPA compliance officer follows Council on Environmental Quality (CEQ) regulations, DOE regulations, and DOE orders and guidance documents.

12.3 TSCA and FIFRA

NETL-Tulsa housed no TSCA-regulated substances and no restricted-use pesticides, herbicides, or defoliants kept within the offices in 2005 or any other years. The landlord and building management organization provide pest control services and grounds keeping services.

12.4 Radiation Protection

12.4.1 Ionizing Radiation Program.

There are no ionizing radiation sources at NETL-Tulsa

12.4.2 Laser Program

NETL-Tulsa has Class I lasers in common office devices such as laser printers, CD readers within PCs, and fiber-optic communications lines. These lasers are built into devices which protect the consumer through engineering design. Staff members may also have laser pointers that are either Class II or Class III and are commonly used by speakers during lectures and presentations. A laser safety program has not been implemented at the Tulsa site and is currently viewed as unnecessary.

12.5 Air Quality and Protection

Because it is strictly an administrative office, NETL-Tulsa has no air quality protection program and no emissions that require monitoring, reporting, or permits. In 2005 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the NETL-Tulsa office. Operation of the Tulsa office does not contribute significantly to any violations of National Ambient Air Quality

Standards (NAAQS). There are no NETL-Tulsa office facilities or projects that are regulated under the National Emission Standards for Hazardous Air Pollutants



(NESHAPS) program. NETL-Tulsa office facilities and projects do not have the potential to emit more than 10 tons-per-year of a single designated toxic air pollutant or more than 25 tons-per-year in aggregate of all toxic air pollutants, nor are any facilities or projects regulated for any of the 189 toxic air pollutants.

Any ozone-depleting refrigerants used for air conditioning inside the offices are under the control of the building management organization. There are no plans or activities relating to the phase-out of ODSs by the NETL-Tulsa staff. Such activities would be undertaken by the building management organization.

12.6 Water Quality and Protection Activities

The building landlord and the landlord's building management contractor deal with sewer use permits and storm water runoff control and permits. It is assumed that the level of impact on surface water has been about the same as for other office complexes in the region. NETL-Tulsa office activities in 2005 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

In 2005, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards. NETL-Tulsa's water supply comes from the municipal water distribution network.

12.7 Executive Orders

12.7.1 EO 13148 -- Greening the Government through Leadership in Environmental Management.

This EO requires federal agencies to implement an EMS and to do more than is required of the private sector in terms of environmental protection and stewardship. However, as previously discussed, the Tulsa office engages in minimal ES&H activities. The office consists of one floor of leased space inside an office building complex. Onsite ES&H primarily focuses on Order 231.1 reporting (e.g., worker injury and lost work day data), the NEPA process, and affirmative procurement of office supplies and miscellaneous items. NETL-Tulsa does not maintain an EMS and is not covered by NETL's system that is in effect at the Pittsburgh and Morgantown sites. Inclusion of the Tulsa office will be considered in the future. NETL-Tulsa does not have a formal pollution prevention program; however, staff members are involved through activities as described under the Pollution Prevention Program above.

12.7.2 EO 13123 -- Greening the Government through Efficient Energy Management.

The NETL-Tulsa electricity costs are included in the rent. Lights and air conditioning are governed by a building energy management system that uses timers, which are on between 6:00 am and 6:00 pm and off at night, on weekends, and on holidays. Windows in the building are tinted and sealed, further reducing the need for cooling. Energy efficient lighting has replaced conventional bulbs, and the staff buys Energy Star products when the opportunity arises. Although there is no formal energy efficiency training in place for the Tulsa staff, they receive informal education through the use of posters throughout the office, and there are containers for recyclables in their offices.

12.7.3 EO 13101, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.

NETL-Tulsa participates in a recycling program established by the landlord and the building management contractor (Metropolitan, Inc.). Receptacles are provided for the collection of waste office paper and aluminum cans. Building management sends to local recyclers the items that can be marketed. All recycling efforts are led by the building management organization. Various scrap materials from building maintenance are also sent to recycling. NETL-Tulsa purchases office paper made with recycled materials and uses refilled toner cartridges. There are no statistics on the amount of materials recycled on behalf of NETL-Tulsa. NETL-Tulsa uses the NETL Small Purchase System (SPS) to buy supplies. This system further encourages affirmative procurement. Individuals who regularly purchase items are instructed to give preference to the purchase of items with recycled content. Large volume items are purchased through the NETL-Morgantown warehouse.

12.8 Groundwater and Soil Quality Protection Activities

There are no groundwater or soil quality protection activities at NETL-Tulsa.

12.9 Other Major Environmental Issues and Actions

NETL-Tulsa is not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of any compliance agreements or cleanup agreements, or any unresolved compliance issues. There were no audits conducted in 2005 under the sponsorship of DOE Headquarters.

13.0 FAIRBANKS

13.1 Site Description

NETL-Fairbanks is located in rented office space in the Duckering Building on the campus of the University of Alaska at Fairbanks. In 2005 NETL-Fairbanks undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the office. Any significant new environmental impacts would be associated with offsite projects supported or funded through the Fairbanks office.

14.0 COMPLIANCE STATUS

14.1 Environmental Compliance

Because of the nature of the work (contracts administration), the small number of employees (four), and the waste management services provided by the University under the terms of the rental agreement, NETL-Fairbanks is not required to implement an environmental compliance program. It has never formally implemented a pollution prevention program. The staff members do engage in affirmative procurement (i.e., the procurement of goods containing recycled content or having less life-cycle impact on the environment). The staff also contributes to the local recycling efforts and undertakes energy-saving steps, such as turning off lights and PCs when not needed. Recycling efforts are managed by the University in coordination with the local borough and include office paper, cardboard, and glass bottles. NETL-Fairbanks ships its spent toner cartridges to the NETL-Morgantown site for recycling.



14.2 National Environmental Policy Act

NETL-Fairbanks requires NEPA reviews for proposed offsite actions. These actions relate to contract awards to other governmental organizations, educational institutions, and private industry. Project proponents fill out a questionnaire regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. The completed questionnaire is reviewed by the NEPA Compliance Officer at the Pittsburgh office of NETL for a determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2005, all NETL-Fairbanks-funded projects were determined to fall within the realm of categorical exclusions.

14.3 EO 13148 -- Greening the Government through Leadership in Environmental Management.

NETL-Fairbanks engages in minimal ES&H activities. The office consists of approximately 1,000 square feet of leased space inside a university building. Onsite ES&H primarily focuses on the NEPA process and affirmative procurement of office supplies and miscellaneous items. The office does not maintain an EMS and is not

covered by NETL's EMS system that is in effect at the NETL-Pittsburgh and NETL-Morgantown. Inclusion of NETL-Fairbanks into the NETL EMS may be considered at some time in the future.

14.4 Other Major Environmental Issues and Actions

NETL-Fairbanks staff members are not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of compliance agreements or cleanup agreements, nor were there any unresolved compliance issues. There were no audits conducted in 2005 under the sponsorship of DOE Headquarters, independent regulators, or other independent third parties.

APPENDIX

ACHD	Allegheny County Health Department
AEO	Arctic Energy Office (NETL-Fairbanks)
AIIS	Assessment Information Input System
ARC	Albany Research Center (NETL-Albany)
ASER	Annual Site Environmental Report
B-	Building
CBT	Computer-Based Training
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	U.S. Code of Federal Regulations
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ES&H	Environment, Safety, and Health
FE	Office of Fossil Energy
FEMP	Federal Emergency Management Program
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GPDU	Gas Process Development Unit
GSA	U.S. General Services Administration
HVAC	Heating, Ventilation, and Air Conditioning
ISM	Integrated Safety Management
ISO	International Standards Organization
LEED	Leadership in Energy and Environmental Design
MGN	Morgantown, West Virginia
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NETL	National Energy Technology Laboratory
NOV	Notice of Violation
NPL	National Priorities List
ODS:	Ozone-depleting Substance
P2	Pollution Prevention Program
PADEP	Pennsylvania Department of Environmental Protection
PC	Personal Computer
PCBs	polychlorinated biphenyls
PGH	Pittsburgh, Pennsylvania

PHA	Pleasant Hills Authority
PPOA	Pollution Prevention Opportunity Assessment
PQAE	Project Quality Assurance Engineer
QA/QC	Quality Assurance/Quality Control
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SARS	Safety Analysis and Review System
SPS	Small Purchase System
SWPA	Southwestern Power Administration
TMDL	Total Maximum Daily Loading
TPH	Total Petroleum Hydrocarbons
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
VOC	Volatile Organic Compound
WVDEP	West Virginia Department of Environmental Protection
WWTF	Wastewater Treatment Facility

Table 3.3 Significant Environmental Aspects – Pittsburgh and Morgantown

- Aspect 1: Waste generation, management, and disposal practices
- Aspect 2: Energy and fuel use
- Aspect 3: Hazardous materials procurement, consumption, storage, and release
- Aspect 4: Control over industrial wastewater treatment facility operations and discharges
- Aspect 5: Air emissions
- Aspect 6: Potential exposure to toxic chemicals and energy releases
- Aspect 7: Understanding of surface waste and storm water discharges
- Aspect 8: Raw materials usage (increasing “green” purchasing)
- Aspect 9: Off-site noise generated on-site
- Aspect 10: Non-industrial land use

Table 3.4 EMP Objectives and Targets – Pittsburgh and Morgantown

EMP	Objective	2005 Target
Aspect 1 – Waste Generation, Management, and Disposal Practices		
1.1 Non-hazardous Waste Generation	Reduce non-hazardous waste.	Generate less than 160 metric tons for a reduction of 75% from the 1993 level of 641 metric tons.
1.2 Hazardous Waste Generation	Reduce hazardous waste.	Reduce RCRA hazardous waste to 1.85 tons for a reduction of 90% from 1993 baseline of 18.46 tons.
1.3 Recycling	Increase the amount of recycled material.	Increase recycling of sanitary waste stream to 45%.
Aspect 2 – Energy and Fuel Use		
2.1 Energy Conservation	Invigorate the NETL Energy Management Program.	Project approved by FEMP.
2.2 Energy Use	Reduce energy use in buildings at NETL.	Reduce energy use per square foot in laboratory and industrial (mixed-use) facilities to 295 X 10 ³ BTU/ft ² for a reduction of 20% from the 1990 baseline of 369 X 10 ³ BTU/ft ² .
2.3 Annual Petroleum Fuel Consumption	Reduce annual petroleum consumption at NETL.	Reduce annual petroleum consumption (adjusted for mileage) for NETL’s vehicular fleet to .0294 gallons per mile for a reduction of 20% of the 2001 baseline of 0.0367 gallons/mile.
2.4 Usage Rate of Alternative Fuels	Increase usage rate of alternative fuels at NETL.	Increase usage rate of alternative fuels to 75% using the 2001 baseline of 13.7%.
2.5 Energy and Environmental Leadership in New Building Design and Construction	Energy and environmental leadership in new building design/construction.	Continue energy efficient designs for the Technology Support Facility buildings at the Morgantown and Pittsburgh sites.
Aspect 3 – Hazardous Materials Procurement, Consumption, Storage, and Release		
3.1 Chemical Inventory	Reduce the chemical inventory.	Reduce the chemical inventory to 5,280 containers for a reduction of 20% from the 2002 baseline of 6,600 containers.
Aspect 4 – Control over Industrial Wastewater Treatment Facility Operations and Discharges		
4.1 Notices of Violation (NOVs)	Improve operation of the wastewater treatment facility.	Zero NOVs.
Aspect 5 – Air Emissions		
5.1 Large Chillers Using CFC’s	Eliminate Class I ODS refrigerants.	Remove all Class 1 R-11 CFCs from large chillers from the site.
5.2 Class I Refrigerants	Eliminate Class I ODS refrigerants.	Reduce CFC inventory to 118 pounds from the 2002 baseline of 190 pounds.

Table 3.4 EMP Objectives and Targets – Pittsburgh and Morgantown

EMP	Objective	2005 Target
5.3 Greenhouse Gases	Reduce emission of greenhouse gases.	Reduce emissions to 50.6 million pounds for a reduction of 25% from the 1990 baseline of 67.4 million pounds.
5.4 Alternate Fueled Vehicles	Obtain alternatively fueled, light-duty vehicles for official use.	Obtain 75% of all light-duty vehicles as alternatively fueled vehicles.
5.5 Emissions of TRI Chemicals	Decrease air emissions of toxic compounds.	Reduce emissions of toxic chemicals to 3,080 pounds for a reduction of 20% from the 1997 baseline of 3,850 pounds.
5.6 Volatile Organic Compound (VOC) Emissions	Decrease release of VOCs from painting.	Decrease paint emissions to 21 pound for a reduction of 50% from the 2002 baseline of 42 pounds.
Aspect 6 – Potential Exposure to Toxic Chemicals and Energy Releases		
6.1 Chemical Handling Facility (CHF)	Decrease risk levels to the environment and to workers associated with chemical and/or energy releases.	Complete construction to the CHF.
Aspect 7 – Understanding of Surface Waste and Storm Water Discharges		
7.1 Water Discharge	Better understand the impacts of NETL and nearby offsite activities on surface water/storm water resources.	Ensure the SARS process considered surface water issues for construction activities.
Aspect 8 – Raw Materials Usage (increasing “green” purchasing)		
8.1 Buying Green	Increase NETL storeroom purchases of items in EPA-designated categories to 100%.	100% of all EPA-designated items are purchased from green sources.
8.2 Buying Green	Determine the baseline for potential green purchases made with credit cards	Implement reporting of credit card purchases.
Aspect 9 – Offsite Noise Generated Onsite		
9.1 Offsite Noise	Reduce fence line noise levels attributable to NETL.	Zero noise complaints from off-site.
Aspect 10 – Non-Industrial Land Use		
10.0 Land Use	Conserve and enhance NETL's non-industrial land.	Implement two recommendations from the Non-Industrial Land Use Committee.

**Table 4.4.a Morgantown Radioactive Materials Inventory
December 2005**

Isotope	Activity/Date Determined	Source	Location
Kr-85	2 mCi 3/30/81	Model #3077, Serial #700T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 1/02/79	Model #3012, Serial #467T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 5/19/80	Model #3012, Serial #626T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 5/78	Model #3077, Serial #373T, Thermo-Systems Inc.	B-25, Room 212
Kr-85	2 mCi 3/30/81	Model #3077, Serial #697T, Thermo-Systems Inc.	B-25, Room 212
Ni-63	15 mCi 6/01/84	Model #6000204, Serial #533, Perkin-Elmer Corp.	B-19, Storeroom
Sc-46	0.065 mCi 7/01/90	University of Missouri	B-16, Radioactive Material Storage Cabinet
Sc-46	0.046 mCi 2/12/91	University of Missouri	B-16, Radioactive Material Cabinet
Ra-226	9 uCi 1/56	Model #B-5, Serial #11205, Mettler Corp.	B-25, Room 206
Ra-226	21 uCi 1/56	Model #M-5, Serial #17032, Mettler Corp.	B-25, Room 112
Ra-226	9 uCi 1/56	Model #B-5 GD, Serial #13805, Mettler Corp.	B-3, Area 150
Phosphate Rock	Consumer Product	Model #1080, Sun Nuclear Corp.	B-16, Radioactive Material Cabinet
H-3	20 Ci 5/94	Model #B100/U10, Serial #575263, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574434, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574435, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574436, SRB Technologies	B-33
Co-57	12 mCi 12/95	Model #IPL CUS, Serial #EE661, Isotope Products Lab	B-16, Industrial Hygiene Laboratory
Cs-137	1 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Cs-137	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	10 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Tl-204	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Tl-204	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Cd-109	10 mCi 5/01	Model #XFB3205, Serial #NR2032, IPL Inc.	B-33

Table 4.4.b 2005 Radioactive Sealed Sources in Use at the Pittsburgh Site

Isotope	Qty	Activity	Supplier/Source	NRC License
Ni-63	1	15 mCi	Gas Chromatograph Electron Capture Device	Held by Hewlett Packard
Cs-137	3	40 mCi (2); 20 mCi (1)	Ronan Engineering Company, Model 137; Level Density Gauge	Held by Parsons

Table 4.4.b 2005 Radioactive Sealed Sources in Use at the Pittsburgh Site

Isotope	Qty	Activity	Supplier/Source	NRC License
Assorted	80	Consumer Product	Smoke Detectors	Not Required

Table 4.4.c 2005 X-Ray Radiation Generating Devices

Device	Quantity	Location
X-Ray Tube	1	B-922 Mail Sorting Facility
X-Ray Diffraction Instrument	1	B-94 X-Ray Diffraction Laboratory
Scanning Election Microscope	2 Devices	B-94 and B-84 SEM Laboratories
Electron Spectroscopy for Chemical Analysis	2 X-Ray Tubes	B-94 Electron Spectroscopy for Chemical Analysis Laboratory

Table 4.11 Summary of Permits – Morgantown Site

Permit Number and Name	Issue Date Exp. Date	Regulatory Agency	Description
R13-1768 Permit to Construct, Modify, or Relocate Stationary Sources of Air Pollutants	05/01/1995 to N/A	WVDEP, Office of Air Quality Permitting Section	This permit allows for the construction and modification of the Experimental Syngas Generator/Hot Gas Desulfurization Process Development Unit (GPDU). It sets forth hours/type of operation and required recordkeeping including reporting requirements.
061 00064 Certificate to Operate	07/01/2005 to 06/30/2006	WVDEP, Division of Air Quality	This permit allows for the operation of the Syngas Generator/GPDU. The certificate is valid for 1 year.
MUB 012 Industrial Wastewater Discharge Permit	07/01/2005 to 06/30/2010	MUB	This permit allows for the operation of wastewater pretreatment facilities and discharge into the MUB Sanitary Sewer System. It sets discharge limits and monitoring requirements, compliance with the Morgantown Industrial Waste Ordinance, reporting requirements including accidental discharge reporting, and testing procedures.
WV0111457 General WV/National Pollutant Discharge Elimination System (NPDES) Storm Water Permit	04/01/2004 to 03/31/2009	WVDEP, Office of Water Resources	This general permit covers storm water associated with industrial activity. It identifies activities that are covered by the permit and the associated monitoring and analysis requirements for each. Also discussed are the Storm Water Pollution Prevention Plan and Groundwater Protection Management Plan required by the permit.
WVG610042 Registration Permit for General WV/NPDES Storm Water Permit	12/07/2004 to 03/31/2009	WVDEP, Office of Water Resources	The general permit registration allows NETL to operate under permit WV0111457, above. The registration establishes the schedule for submission of Discharge Monitoring Reports, as well as discussions on monitoring, sampling, and analysis requirements. This registration makes the general WV permit applicable to NETL.

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
1.1 Reduce Non-Hazardous Wastes	75% reduction by 2005 and 80% reduction by 2010 based on 1993 baseline (641 tonnes) CY 2005: 160 tonnes (75% reduction)	183.76 tonnes	5	3	MGN's landfill waste increased because of large amount of construction/demolition activity. Additional work is needed to complete ferric chloride reduction study. Modified chemistry – rather than sludge dewatering – may be most feasible sludge weight reduction strategy. Passive dewatering may be too labor-intensive to be feasible.
1.2 Reduce Hazardous Wastes	90% (reduction by 2005, using a 1993 baseline 18.46 tonnes). CY 2005: 1.85 tonnes (90% reduction)	9.26 tonnes	4	4	Mothballing of PDU in MGN (~6 tons) and continued cleanout of labs in PGH pushed 2004's numbers high. 11.315 tons of hazardous waste was disposed of at both MGN and PGH. In the future NETL will be using updated numbers which will only include "normal" hazardous wastes.
1.3 Increase Non-Hazardous Waste Recycling	Increase recycling of sanitary waste streams to 45% by 2005 and 50% by 2010 CY 2005: 45%	46%	2	2	Target exceeded. The values demonstrate a 6.22% 4th qtr. CY-05 reduction in energy use per square foot as compared to 4th qtr CY-04. Does not include landfill gas for NETL-PGH. Site as identified and qualified as a renewable credit by DOE Headquarters EMS-4 Data base.
2.1 Energy Conservation	Reduce energy consumption through life-cycle cost-effective measures CY 2005: Project to be approved by FEMP	Projects approved - target met.	5	3	Three PGH and one MGN energy savings projects have been selected and are underway. Feasibility study has been completed. Designs for Low steam Boilers completed. Due to time and Safety constraints NETL chose to complete boiler replacement with 8a Construction Contract rather than pursue FEMP funding. Design for energy metering of B-26 is complete. Construction Contract was awarded end of FY05. No articles written for Plugged In No CBT completed

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
2.2 Reduce NETL Energy Consumption	Reduce energy use per square foot in laboratory and industrial (mixed-use) facilities by 20% by FY 2005, using a 1990 baseline. CY 2005: 295 X 103 BTU/ft ² (20% reduction)	202 X 103 BTU/ft ² (45%)	2	2	Target was exceeded.
2.3 Annual Petroleum Fuel Consumption	Reduce annual petroleum consumption (adjusted for mileage) for NETL's vehicular fleet by 20% by 2005 using 2001 baseline (adjusted for mileage) of 0.0367 gallons per mile CY 2005: 0.0294 gallons per mile (20% reduction)	Target was not met - actually was 0.0350 gallons per mile (5%) - first year for positive trend	5	3	The permission to use the ethanol station was issued June 1, 2005. We have already used about 400 gals. The permission to use the CNG quick-fill station (PGH) was issued October 16, 2005. The first two months of FY06 we have used 2,932 gallons equivalent of alternative fuels. Waiting to see if we can get the monies to complete this work. The awards/training ceremonies were held September 26th (PGH) and September 27th (MGN) Posted the notice about the ethanol and CNG Quick-fill station (PGH) is now open and also the use of alternative fuels Article coming out in Plugged In
2.4 Usage Rate of Alternative Fuels	Increase usage rate of alternative fuels to 75% by 2005. CY 2005: 75%	Target was not met - actual of 35%			
2.5 Energy & Environmental Leadership in New Building Design/Construction	Incorporate sustainable design features to attain Leadership in environmental and Energy Design (LEED) certification and Energy Star designation for new building construction.	Target Met	3	3	Although tasks were late from time to time, design and construction is on schedule.

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
3.1 Reduce Hazardous Materials Procured, Received and Stored	Reduce the chemical inventory (number of containers) by 20% by 2005 based on 2002 baseline (4748 containers) CY 2005: 5,280 containers (20% reduction)	5,183	1	1	Processes ongoing. Target met and exceeded in 2003. Inventory total of 5183 containers, a 21% reduction.
4.1 Reduce/Eliminate Violations and Maintain Compliance with Industrial Sewer Use Pretreatment Permit	Reduce the number NOV's issued CY 2005: Zero (0) NOV's to be issued	0 NOV's	4	2	Completion date and start up of new system were delayed which caused 2 tasks to be incomplete. Target was met with zero (0) NOV's.
5.1 Large Chillers Using CFC's	By 2005, retrofit or replace 100% of chillers greater than 150 tons of cooling capacity and manufactured before 1984 and use Class 1 refrigerants (Baseline number of chillers fitting this category = 2) CY 2005: Remove all Class 1 R-11 CFCs from chiller from the site (~700 lbs)	Target was met	1	1	4th qtr. 2-225ton Chillers have been demolished, removed from NETL PGH. Site (August 2005) and replaced with 2 more energy efficient 167 ton Ozone (R-407C refrigerant) friendly chillers which are operational. R-11 refrigerant for 2-225 ton chillers was removed from CHF inventory and shipped to Defense Depot Richmond Va. 8/18/2005
5.2. Class 1 Refrigerants	Eliminate use of Class I refrigerants by year 2010, to the extent economically practicable, and to the extent that safer alternatives are available (inventory = 190 lbs) CY 2005: 118 lbs	92 pounds (93.7%)	1	1	6.624lbs of class I refrigerants removed from CHF inventory in the 4th qtr. (not associated with the 2225 ton R-11 cfc chillers in B-94) NETL has reduced its inventory of Class I refrigerant equipment and gases by 93.7% since 2002 and has met its EMP for 2005.

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
5.3 Reduce Generation of Greenhouse Gases	Reduce generation of greenhouse gases attributed to facility energy use through life-cycle cost effective measures by 25% by year 2005 and 30% by year 2010, using 1990 as a baseline (67.4 million lbs.). CY 2005: 50.6 million lbs (25% reduction)	50,494 million lbs (25.13)	2	2	Target was met. These values are based on Allegheny Power's 2003 Clean Energy supply of 3.3109% of its total supplied electricity. The values represent a 5.42% reduction in green house gas emissions (electricity usage) from CY-04 4th quarter compared to CY-05 4th quarter. These values represent a 22.8% reduction in greenhouse gas emissions (natural gas use) for 4th quarter CY-05 as compared to the 4th qtr CY-04.
5.4 Increase Use of Alternative Fuel Vehicles	Acquire at least 75% of light-duty vehicles as an alternative fuel vehicle by 2005 and 90% by 2010. CY 2005: 75%	90%	2	2	Only two vehicles were replaced with an alternative fueled vehicle. The other vehicle planned to be replaced was not available with a snow plow package in an alternative fueled vehicle. It was replaced with a gasoline vehicle. In addition there were seven alternative fueled vehicles that were replaced with seven more alternative fueled vehicles. That is nine of ten light-duty vehicles were replaced with an alternative fueled vehicles 90%.
5.5 Decrease Air Emissions of Toxic Compounds	Reduce emissions of chemicals on the TRI List by 20% by 2005 using 1997 as baseline (3,850 lbs) CY 2005: 3,080 lbs (20% reduction)	1193	4	4	All tasks were completed on schedule.
5.6 Decrease Air Emissions from Painting Operations	CY 2005: 21 lbs released to the atmosphere (50% reduction)	2 lbs	1	1	2 pounds of spray paint have been purchased during CY 2005

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
6.1 Reduce Risks to Workers and Environment Associated with CHF	Decrease risk levels to the environment and to workers associated with chemical and/or energy releases. CY 2005: Complete all construction of the CHF	Target was not met - construction is not complete	8	6	
7.1 Better Understand Impacts of NETL and nearby Surface/Storm Water Resources	CY 2005: Ensure SARS process considers surface water for construction activities	Target met	3	3	All tasks were completed on schedule and target was met.
8.1 Buying Green – Warehouse	Increase to 100% purchase of items routinely used at NETL on the list of EPA-designated items manufactured from "post-consumer" materials. CY 2005: 100% recycle	100%	3	3	Target continues to be maintained at 100%

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
8.2 Buying Green – Credit Card Purchases	Determine the baseline for potential “green” purchases made with credit cards	Target Not Met	3	1	It has been very difficult to extract the necessary data from SPS for establishing a baseline. Although we have queried SPS by keying on Federal Stock Code Groupa (FSCG) (related to EPA-designated products) to monitor Green Purchases, we have not been able to identify all purchases in the affirmative procurement list under P2 since SPS does not contain full Federal Stock Numbers but rather group numbers that do not easily correlate with these EPA items. Until such time HQ or DOE-NETL develop a system to track these purchases, we will not be able to establish a reliable baseline of green purchasing under simplified acquisition. Since SPS will eventually be replaced by a DOE-wide system mandated by DOE-HQ, NETL IT is not willing to expend resources to enhance the current SPS. Since site support contractors are new, we may have to extend this task into CY06 to allow time for new CORs to implement accurate and complete reporting requirements for EPA designated items.
9.1 Reduce “Fence Line” Noise Levels Attributable to NETL Operations	Noise levels at the fence line attributable to NETL operations under normal conditions will be reduced to below ordinance standards 100% of the time by 2004; there will be zero complaints from neighbors.	0	No EMP for this Aspect		No violations or complaints have been received.

Table 4.14.a – 2005 Environmental Management Plan (EMP) Status

Objective	Target(s)	EMP Target Status	Number of Tasks	Tasks Completed	Summary of Progress
10.1 Conserve and Enhance NETL's Non-Industrial Land Use	CY 2005: Implement 2 Recommendations from the Non-Industrial Land Use Committee	1 project completed	4	4	Tasks were completed, but the target was not met - only the low end project was completed. High end project was not approved nor funded.

Table 4.14.c -- Summary of EMP Activity

All EMPS	Task Totals		63	51
	Percent Tasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Targets	Green	15	68%
		Yellow	4	18%
Red		3	14%	
Total Targets		22	77% Percentage = (Green + .5 Yellow)/Total	
ES&H EMPS	Task Totals		32	26
	Percent Tasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Targets	Green	6	67%
		Yellow	1	11%
Red		2	22%	
Total Targets		9	72% Percentage = (Green + .5 Yellow)/Total	
SOD EMPS	Task Totals		21	17
	Percent Tasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Targets	Green	7	78%
		Yellow	2	22%
Red		0	0%	
Total Targets		9	89% Percentage = (Green + .5 Yellow)/Total	

Table 4.14.b Surveillance Monitoring

Type of Surveillance	Contact	Type of Monitoring	Key Characteristics	Frequency	Location
SARS review	ES&H Division	Review of requirements in SARS procedure	Operational control, document control	Annually	Various laboratories, support operations, facilities
ES&H management walkthrough	ES&H Division	Visual inspection of work sites	ISM observance	Monthly	Site-wide
Transformer inspection (MGN)	EG&G	Visual assessment of oil-filled transformer	Regulatory compliance	Daily	Site-wide
Transformer inspection (PGH)	SAIC	Visual assessment of oil-filled transformer	Regulatory compliance	Weekly	Site-wide
Storage tank inspection (MGN)	EG&G	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Interstitial storage tank monitoring (MGN)	EG&G	Interstitial monitoring of dual-wall tanks	SPCC plan compliance, regulatory compliance	Quarterly	B29, B36, Navy facility fuel storage tanks
Storage tank inspection (PGH)	SAIC	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Radiation gauge survey	Parsons	Leak test of radiation sources	Regulatory compliance	Semi-annual	At radiation sources, B-84
Safety observer inspection (PGH)	EG&G	Visual inspections of work-sites	Contractor ISM observance, operational control	Semi-annual	Site-wide
Water usage (PGH)	Site Operations Division	Document water usage	Operational	Daily	B-83, 84, 93, 94, chillers, boiler house
Backup generators (PGH)	SAIC	Backup generators inspection	Operational	Weekly	Site-wide
Chemical handling facility (CHF) (PGH)	EG&G	CHF operations inspection checklist	Operational	Daily	B64, B91, B92

Table 6.1.1 NETL Potential Contamination Sources and Cleanup Actions		
Potential Source	Potential Contamination	Current Status
Underground Storage Tanks	BTEX	All tanks removed 1991 or before.
42-Inch Coal Gasifier	Coal Tar Polynuclear Hydrocarbons, BTEX	Gasifier removed; soil removed to 10 feet in 1994.
Stretford Pad	Stretford Solution (vanadium and cadmium compounds)	Pad removed; soil removed to 10 feet in 1994.
Wastewater Pond 001	Coal Tar Polynuclear Hydrocarbons, BTEX, metals	Removed 1995; site filled and re-graded.
Wastewater Pond 002	Coal Tar Polynuclear Hydrocarbons, BTEX, metals	Removed in mid 1980s.
Wastewater Pond 005	Coal Tar Polynuclear Hydrocarbons, BTEX, cyanide, metals	Removed 1985; backfilled and paved as a parking lot.
Contaminated Sewer Lines	Mercury	Removed from B-1 to a point east of B-3; lines from B-3 to Burroughs Run remain.
Underground Lines from B-4 to Pond 005	Coal Tar Polynuclear Hydrocarbons	In place; soil investigated 1996.

Table 6.1.2 Properties of Potential Contaminants

Contaminant Suite	Potential Contaminant	Density (g/ml)	Physical State	Water Solubility	Sorption Coefficient	Carcinogenic
			@ approx. 20 deg C		log KOC	
Coal Tar	Acenaphthalene	0.899	Solid	3.93 mg/l	3.68	
Polynuclear Hydrocarbons	Acenaphthene	1.069	Solid	3.47-3.93 mg/l	3.79	
	Benzo(b)fluoranthene		Solid	0.0012 mg/l	5.74	potential
	Benzo(k)fluoranthene		Solid	0.00055 mg/l	6.64	potential
	Benzo(a)anthracene	1.274	Solid	0.01-0.44 mg/l	6.14	+
	Benzo(a)pyrene	1.351	Solid	0.003 mg/l	5.60-6.29	+
	Benzo(e)pyrene	0.8769	Solid	0.004 mg/l	5.6	+
	Biphenyl (diphenyl)	0.866	Solid	7.5 mg/l	3.23	
	Chrysene	1.28	Solid	0.0015-0.006mg/l	5.39	weak
	Coronene		Solid	0.00014 mg/l	7.8	
	o-Cresol (2-methylphenol)	1.041	Solid	24,500 mg/l	1.34	
	Dibenzofuran	1.0886	Solid	10 mg/l	3.91-4.10	
	Dibenz(a,h)anthracene	1.282	Solid	0.005 mg/l	6.22	+
	Fluoranthene	1.252	Solid	0.275 mg/l	4.62	potential
	Fluorene	1.203	Solid	1.9 mg/l	3.7	potential
	Indene	1.006	Liquid			
	3-Methylcholanthrene					+
	Methyldibenzofuran					
	Methylphenanthrene (1,2,3,4-)	1.161	Solid	0.073 mg/l	4.56	
	1-Methylnaphthalene	1.025	Liquid	26-28 mg/l		
	2-Methylnaphthalene	1.006	Solid	24.6-25.4 mg/l	3.87-3.93	
	4-Methylphenol (p-cresol)	1.0347	Solid	19,400 mg/l	1.69	
	Naphthalene	1.152	Solid	30 mg/l	2.74-3.52	-
	Phenanthrene	1.025	Solid	1.6 mg/l	3.72-4.59	-
Phenol (carbolic acid)	1.0576	Solid	82,000 mg/l	1.24-1.43		
Pyrene	1.271	Solid	0.16 mg/l	4.22-5.65	+	
Triphenylene	1.302	Solid	0.38 mg/l	4.0-6.9		
BTEX	Benzene	0.878	Liquid	1780 mg/l	1.69-2.00	+
	Ethylbenzene	0.867	Liquid	152 mg/l	1.98-2.41	
	Toluene	0.8669	Liquid	538 mg/l	1.89-2.49	
	m-Xylene	0.8842	Liquid	146-160 mg/l	2.26	
	o-Xylene	0.8802	Liquid	176 mg/l	1.68-1.83	
	p-Xylene	0.8611	Liquid	156-185 mg/l	2.52	
Stretford Solution	Vanadium	6.11	Solid			
	Cadmium	8.642	Solid			
Contaminated Sewer	Mercury	13.534	Liquid			

Table 6.1.3a Hazardous Waste Generation NETL-Morgantown

Waste Stream	Quantity Generated (lbs)	Quantity Shipped (lbs)
Poison (Toxic solids & Liquids)	37	37
Waste Mercury	7	7
Waste Corrosive Liquids	11093	11093
Waste Flammable Solvents	140	140
Waste Oxidizers	7	7
Chemical Waste	100	100
Waste Solvents	148	148
Other RCRA Compounds	41	41
Fluorescent Light Tubes (Universal Waste)	770	770
Batteries (Universal Waste)	2670	2670
TOTAL	15013	15013

Table 6.5 Air Emissions Permits – Morgantown Site

Permits	Status	Exceedance	NOVs	Sources	Pollutants	Emissions	Criteria
R13-1768 and 061- 00064	Renewed for 2005	None	None	Minor emission sources, GPDU	None monitored by requirement	Not monitored by requirement	1440 hours operation per year

Table 6.6.1.a -- NPDES Permit Storm Water Monitoring Requirements and Limits

Outfall	Pollutants of Concern	Limits	Frequency
002	Nitrite + Nitrate Nitrogen Fecal Coliform	0.68 mg/l	6 mo 6 mo
005	Total Suspended Solids Fecal Coliform	100 mg/l	6 mo 6 mo
010	BOD Total Suspended Solids Ammonia Nitrogen Fecal Coliform pH COD	30 mg/l 100 mg/l 4 mg/l Report only 9 120	6 mo 6 mo 6 mo 6 mo 6 mo 6 mo
010	Oil & Grease	15 mg/l	6 mo

Table 6.6.1.b NETL-Morgantown NPDES Storm Water Analysis Results

Constituents Cutoff	Conc.	Outfall 002		Outfall 005		Outfall 010	
		5/20/05	8/8/05	5/20/05	8/8/05	5/20/05	8/8/05
Nitrate + Nitrite Nitrogen (Grab)	0.68 mg/L	1.3 mg/L	0.56 mg/L	NS	NS	NS	NS
Ammonia Nitrogen (Grab)	4 mg/L	NS	NS	NS	NS	ND	ND
Fecal Coliform (Grab)	---	180 col/100 mL	>4,000 col/100 mL	510 col/100 mL	>4,000 col/100 mL	2,900 col/100 mL	500 col/100 mL
Total Suspended Solids (Grab)	100 mg/L	NS	NS	23 mg/L	10 mg/L	70 mg/l	290 mg/l
BOD	30 mg/l	NS	NS	NS	NS	ND	4.3 mg/l
pH	9	NS	NS	NS	NS	7.42	8.01
COD	120 mg/l	NS	NS	NS	NS	19 mg/l	30 mg/l
Oil & Grease	15 mg/l	NS	NS	NS	NS	ND	ND

NS = Not Sampled; ND = Not Detected

Table 6.6.1.c Surveillance Monitoring

Type of Surveillance	Contact	Type of Monitoring	Key Characteristics	Frequency	Location
SARS review	ES&H Division	Review of requirements in SARS procedure	Operational control, document control	Annually	Various laboratories, support operations, facilities
ES&H management walkthrough	ES&H Division	Visual inspection of work sites	ISM observance	Monthly	Site-wide
Transformer inspection (MGN)	EG&G	Visual assessment of oil-filled transformer	Regulatory compliance	Daily	Site-wide
Transformer inspection (PGH)	SAIC	Visual assessment of oil-filled transformer	Regulatory compliance	Weekly	Site-wide
Storage tank inspection (MGN)	EG&G	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Interstitial storage tank monitoring (MGN)	EG&G	Interstitial monitoring of dual-wall tanks	SPCC plan compliance, regulatory compliance	Quarterly	B29, B36, Navy facility fuel storage tanks
Storage tank inspection (PGH)	SAIC	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Radiation gauge survey	Parsons	Leak test of radiation sources	Regulatory compliance	Semi-annual	At radiation sources, B-84
Safety observer inspection (PGH)	EG&G	Visual inspections of work-sites	Contractor ISM observance, operational control	Semi-annual	Site-wide
Water usage (PGH)	Site Operations Division	Document water usage	Operational	Daily	B-83, 84, 93, 94, chillers, boiler house
Backup generators (PGH)	SAIC	Backup generators inspection	Operational	Weekly	Site-wide
Chemical handling facility (CHF) (PGH)	EG&G	CHF operations inspection checklist	Operational	Daily	B64, B91, B92

Table 6.6.1.d NETL-Morgantown 2005 Wastewater Effluent Analysis (lb/d); Pretreatment Permit, Outfall 001, One sample/month													
Parameter	Limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (MGD)													
Monthly Avg	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Daily Max	0.15	0.04	0.06	0.06	0.05	0.02	0.01	0.05	0.05	0.02	0.03	0.05	0.02
BOD5													
Monthly Avg	None	0.2	0.2	0.2	0.2	ND	0.2	0.2	ND	ND	ND	ND	ND
Daily Max	None	0.7	1.0	1.0	0.8	ND	0.3	0.8	ND	ND	ND	ND	ND
TSS													
Monthly Avg	None	0.4	0.4	0.6	0.4	ND	0.2	ND	ND	ND	ND	ND	ND
Daily Max	None	1.7	2.5	3.5	2.1	ND	0.4	ND	ND	ND	ND	ND	ND
Arsenic													
Monthly Avg	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium													
Monthly Avg	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0002
Daily Max	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0003
Chromium													
Monthly Avg	0.007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper													
Monthly Avg	0.04	0.003	0.001	0.001	0.002	0.002	0.001	0.001	ND	ND	0.001	0.001	0.001
Daily Max	0.06	0.010	0.005	0.005	0.008	0.003	0.003	0.004	ND	ND	0.002	0.003	0.002
Cyanide													
Monthly Avg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead													
Monthly Avg	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.038	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury													
Monthly Avg	0.0006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.0009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel													
Monthly Avg	0.01	0.0006	0.0005	0.0004	ND								
Daily Max	0.015	0.0020	0.003	0.003	ND								
Silver													
Monthly Avg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc													
Monthly Avg	0.2	0.011	0.006	0.009	0.01	0.005	0.006	0.006	0.003	0.003	0.003	0.003	0.003
Daily Max	0.3	0.043	0.035	0.055	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01
Iron													
Monthly Avg	None	0.02	0.01	0.02	0.03	0.02	0.01	0.03	0.006	0.011	0.016	ND	0.02
Daily Max	None	0.10	0.06	0.11	0.16	0.03	0.02	0.15	0.03	0.05	0.12	ND	0.05
Manganese													
Monthly Avg	None	0.008	0.01	0.01	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Daily Max	None	0.033	0.07	0.17	0.09	0.04	0.02	0.04	0.09	0.07	0.11	0.04	0.02
Phenolics													
Monthly Avg	None	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	ND
Daily Max	None	ND	ND	ND	ND	ND	ND	ND	ND	0.016	ND	ND	ND

Table 6.6.1.d NETL-Morgantown 2005 Wastewater Effluent Analysis (lb/d);**Pretreatment Permit, Outfall 001, One sample/month**

Parameter	Limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Organic Halogens	None	ND	0.003	0.003	0.002	0.004	0.004	0.015	0.002	0.002	0.001	0.003	0.004
Monthly Avg	None	ND	0.020	0.020	0.008	0.009	0.008	0.076	0.009	0.010	0.011	0.020	0.008
Daily Max													
Organics Alachlor-1254													
All other parameters	None	NS	NS	NS	NS	ND	NS						
	None	NS	NS	NS	NS	ND	NS						
pH (s.u.)													
Minimum	6.0	7.8	7.9	6.5	7.6	7.0	7.2	7.3	7.3	7.6	7.2	7.7	7.0
Maximum	9.0	8.9	8.7	8.1	8.4	8.5	8.0	7.9	7.9	8.1	7.8	8.1	8.0

MGD = millions of gallons per day; NS = not sampled; ND = not detected; TSS = total suspended solids; BOD5 = biological oxygen demand for 5-day period; s.u. = standard units

Figure 6.8.1 Active Monitoring Wells at the NETL-Morgantown Site

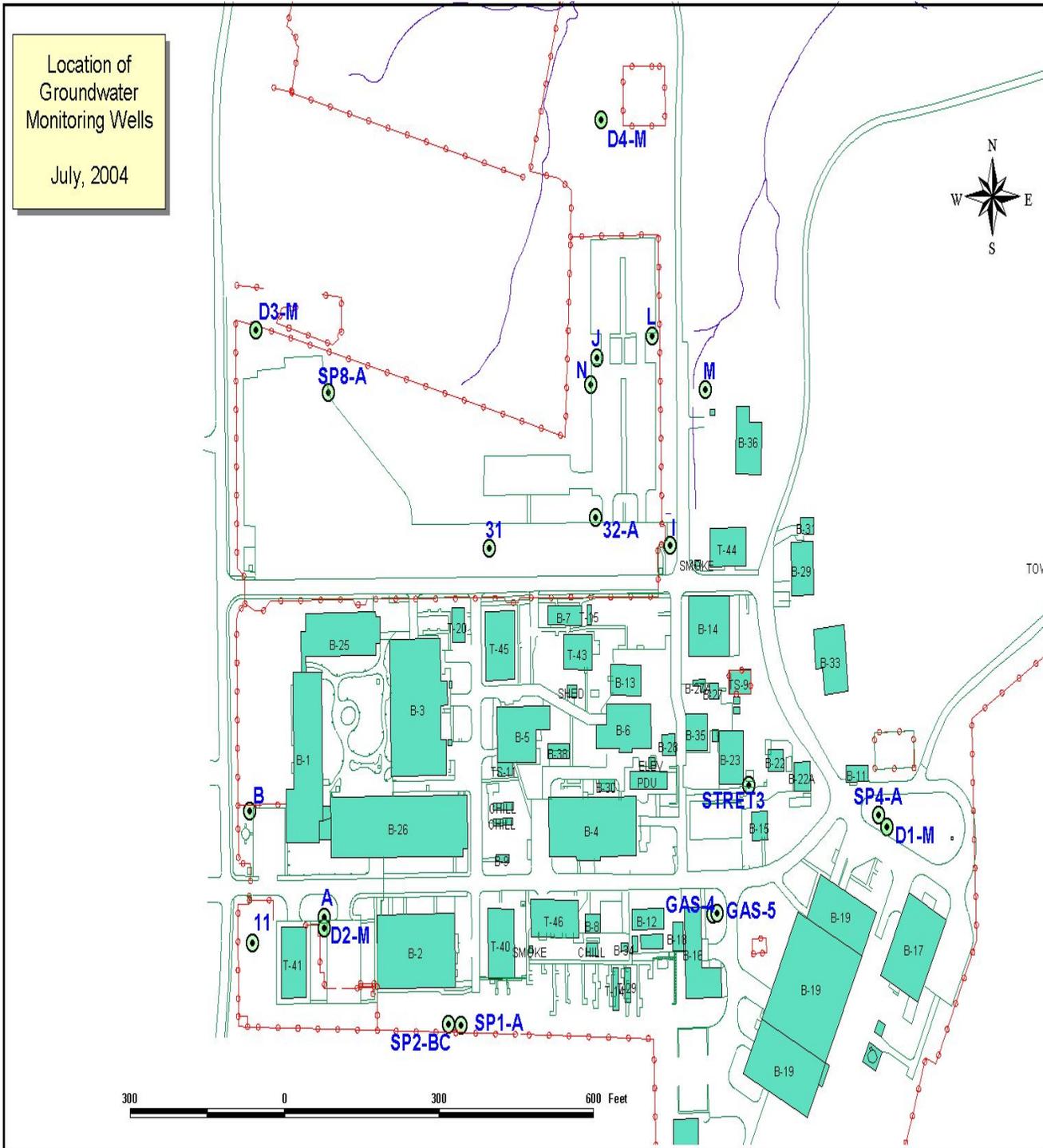


Table 6.8.1.a NETL-Morgantown June 2005 Groundwater Data for "A" Aquifer

Parameter	Sample Location												
	A	B	SP1-A	SP4-A	SP8-A	SP9-A	I	J	K	L	M	N	GAS-4
pH (s.u)	6.4	6.2	6.3	6.3	6.2	P&A	6.6	5.8	P&A	6.2	4.9	5.2	6.4
Specific Conductance (µmhos)	148	133	150	149	194	P&A	2887	895	P&A	1507	3960	813	754
Temperature (°C)	16.2	16.0	15.6	16.0	17.4	P&A	17.8	20.2	P&A	17.0	17.1	20.4	16.2
Cadmium (total, mg/L)	NT	NT	NT	NT	NT	P&A	ND	.0012	P&A	.0011	ND	.0014	NT
Benzene (mg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT
Toluene (mg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT
Ethylbenzene (mg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT
Total Xylenes (mg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT
Chloride (mg/L)	NT	NT	NT	NT	NT	P&A	2	220	P&A	340	63	190	NT
Sulfide (mg/l)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT
Sulfate (mg/L)	NT	NT	NT	NT	NT	P&A	13	48	P&A	73	75	56	NT
Total Recoverable Phenolics (mg/L)	NT	NT	NT	NT	NT	P&A	.028	ND	P&A	ND	ND	ND	NT
Naphthalene (µg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	ND	ND	NT

ND = not detected; s.u. = standard units; NT = not tested; P&A = well plugged

Table 6.8.1.b NETL-Morgantown June 2005 Groundwater Data for "B-C" Aquifer

Parameter	Sample Location					
	11	SP2-BC	32A	31	GAS-5	STRET3
pH (s.u)	6.3	6.5	5.4	5.5	6.5	5.9
Specific Conductance (µmhos)	94	227	1754	448	548	44
Temperature (° C)	16.3	16.2	18.8	17.7	15.1	15.7

ND = not detected; s.u. = standard units.

Table 6.8.1.c NETL-Morgantown June 2005 Groundwater Data for Morgantown Aquifer

Parameter	Sample Location			
	D1M	D2M	D3M	D4M
pH (s.u)	6.4	8.8	7.8	6.3
Specific Conductance (µmhos)	209	267	219	214
Temperature (° C)	16	16.3	15.7	14.2

ND = not detected; s.u. = standard units

Table 8.1.2 Tier II Chemical Inventory Reporting List

Chemical Name	CAS	Average and Maximum Daily Amount (lbs)	TPQ (lbs)
Nitrogen (liquid and gaseous)	7727-37-9	114,650	10,000
Nitric oxide	10102-43-9	448	100
Sulfur dioxide	7446-09-5	1,666	500

Table 8.3.1 TSCA Chemical Held Onsite In Excess Of 10 Lbs.

Common Name	CAS
Naphthalene, 1,2,3,4-tetrahydro-	000119-64-2
Carbon Tetrachloride	000056-23-5
Boric Acid	010043-35-3
Nitric Acid	007697-37-2
Hydrochloric Acid	007647-01-0
N-Hexane	000110-54-3
Sodium Acetate	000127-09-3
Carbon Dioxide	000124-38-9
Ethyl Acetate	000141-78-6
Ferric Chloride	007705-08-0
Methanol	000067-56-1

Table 8.3.2 2004 Radioactive Sealed Sources in Use at the Pittsburgh Site

Isotope	Qty	Activity	Supplier/Source	NRC License
Ni-63	1	15 mCi	Gas Chromatograph Electron Capture Device	Held by Hewlett Packard
Cs-137	3	40 mCi (2); 20 mCi (1)	Ronan Engineering Company, Model 137; Level Density Gauge	Held by Parsons
Assorted	80	Consumer Product	Smoke Detectors	Not Required

Table 8.3.3 2004 Radiation Generating Devices: X-ray Devices

Device	Quantity	Location
X-Ray Tube	1	B-922 Mail Sorting Facility
X-Ray Diffraction Instrument	1	B-94 X-Ray Diffraction Laboratory
Scanning Election Microscope	2 Devices	B-94 and B-84 SEM Laboratories
Electron Spectroscopy for Chemical Analysis	2 X-Ray Tubes	B-94 Electron Spectroscopy for Chemical Analysis Laboratory

Table 8.5.1 2005 Air Emissions Annual Report

Pollutant	Estimated Emissions (Tons/Year)					
	500 lb Combustion Unit	MCCF	Combined Boilers	Unpaved Roads	Paved Roads	Total Site
Carbon Monoxide	0.0	0.0	0.10914	0.00324	0.06164	0.17402
Lead	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Dioxide	0.0	0.0	0.12995	0.000024	0.00452	0.134494
Particulate Matter <10 micron	0.0	0.0	0.0015427	0.067	0.266672	0.336181
Particulate Matter Total	0.0	0.0	0.0015427	0.31	1.71	2.022461
Sulfur Dioxide	0.0	0.0	0.0007797	0.0	0	0.00078
VOCs	0.0	0.0	0.0071348	0.00022	0.00418	0.011535

Table 8.6.1-- NETL-PGH Industrial Sewer Use Permit (Building 74) Monitoring Analysis

Constituent	Free Cyanide	Phenol	Copper	Mercury	Chloroform	pH
Permit Limit	< 0.005 mg/L	0.025 mg/L	0.08 mg/L	< 0.0002 mg/L	< 5 ug/L	6.0 - 9.0 s.u.
April 11, 2005 Sampling Date						
Building 74 Effluent						
Composite	ND (< 0.0050 mg/l)	ND (< 0.0050 mg/l)	ND (< 0.0050 mg/l)	ND (< 0.00020 mg/l)	ND (< 5.0 ug/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	7.20 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	7.49 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	6.93 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	7.39 s.u.
October 13, 2005 Sample Date						
Building 74 Effluent						
Composite	ND (< 0.0050 mg/l)	ND (< 0.0050 mg/l)	ND (< 0.0050 mg/l)	ND (< 0.00020 mg/l)	ND (< 5.0 ug/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	7.23 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	8.24 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	7.31 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	7.68 s.u.

ND = not detected; N/A = not applicable; s.u. = standard units; mg/L = milligrams per liter; µg/L = micrograms per liter; permit exceeded = shaded values.

Table 8.6.2 -- Building 74 Monthly Monitoring results

Constituent	Permit Limit	01/11	02/08	03/17	04/11	05/10	06/07	07/12	08/02	09/07	10/13	11/08	12/07
		SGS	SGS	SGS	SGS	SGS	SGS	SGS	SGS	SGS	SGS	SGS	SGS
Aluminum	None	ND	0.12	ND	0.67	0.44	0.42	0.61	0.35	ND	ND	1.6	1.4
Cadmium	None	ND	ND	ND	ND	ND	ND	ND	ND	0.0042	ND	ND	ND
Chromium	None	0.023	0.011	ND	ND	ND	0.0091	ND	ND	ND	ND	ND	ND
Cooper	0.08	0.0052	ND	ND	ND	0.0060	ND	ND	ND	ND	ND	0.0063	ND
Cyanide (free)	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOX	None	ND	0.053	0.049	0.067	0.033	0.029	0.020	0.17	ND	ND	0.035	0.032
Iron	None	ND	ND	0.15	0.22	0.14	0.27	0.069	0.080	1.8	0.099	0.17	ND
Lead	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	<0.0002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	None	ND	ND	ND	ND	ND	ND	ND	ND	0.068	0.0081	ND	ND
Oil & Grease	None	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (s.u.)	6.0 – 9.0	6.8	7.9	7.2	7.3	7.0	8.4	7.4	7.7	6.9	6.8	7.2	7.2
Phenolics	0.025	ND	0.019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS	None	ND	ND	ND	ND	ND	ND	ND	ND	5.0	ND	8.0	ND
Tin	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloromethane	<0.005	ND	ND	ND	ND	0.0053	ND	ND	ND	ND	ND	ND	ND
Zinc	None	ND	ND	ND	ND	ND	ND	ND	ND	0.020	ND	ND	ND

ND = not detected; N/A = not applicable; s.u. = standard units; mg/L = milligrams per liter; µg/L = micrograms per liter; permit exceeded = shaded values.

Table 8.6.3 -- NETL-PGH 2005 National Pollutant Discharge Elimination System Storm Water Analysis Results

Constituent	Sample Date			
	03/23/05	06/14/05	09/20/05	11/29/05
North Outfall – PGH				
Flow	0.892 MGD	7.242 MGD	0.031 MGD	5.750 MGD
Suspended Solids	26 mg/L	41 mg/L	10 mg/L	180 mg/L
CBOD5	2.2 mg/L	17 mg/L	5.3 mg/L	ND (< 3.3 mg/l)
Oil and Grease	ND (< 5.0 mg/l)	ND (< 5.0 mg/l)	ND (< 5.0 mg/l)	ND (< 5.0 mg/l)
Aluminum	0.56 mg/L	2.4 mg/L	ND (< 0.10 mg/l)	5.1 mg/L
Iron	0.87 mg/L	6.3 mg/L	0.18 mg/L	7.5 mg/L
Manganese	0.13 mg/L	0.42 mg/L	0.11 mg/L	0.40 mg/L
Lead	ND (< 5.0 ug/l)	15 ug/L	ND (< 5.0 ug/l)	25 ug/l
Mercury	ND (< 0.20 mg/l)	1.6 ug/L	ND (< 0.20 mg/l)	ND (< 0.20 mg/l)
pH	7.33 s.u.	7.57 s.u.	8.12 s.u.	7.24 s.u.
Ammonia Nitrogen	ND (< 1.0 mg/l)	6.7 mg/l	ND (< 1.0 mg/l)	ND (< 1.0 mg/l)
South Outfall – PGH				
Flow	0.375 MGD	6.527 MGD	0.068 MGD	8.469 MGD
Suspended Solids	48 mg/L	200 mg/L	48 mg/L	160 mg/L
Aluminum	1.9 mg/L	1.5 mg/L	7.9 mg/L	5.5 mg/L
Iron	0.74 mg/L	1.8 mg/L	0.82 mg/L	6.7 mg/L
Manganese	0.32 mg/L	0.12 mg/L	0.91 mg/L	0.36 mg/L
Lead	ND (< 5.0 ug/l)	16 ug/L	ND (< 5.0 ug/l)	12 µg/L
pH	7.48 s.u.	7.47 s.u.	7.98 s.u.	7.61 s.u.
Ammonia Nitrogen	ND (< 1.0 mg/l)	ND (< 1.0 mg/l)	ND (< 1.0 mg/l)	ND (< 1.0 mg/l)

MGD = millions of gallons per day; s.u. = standard units; ND = Non Detected.

Figure 8.8.3 – NETL-Pittsburgh Groundwater Management Program Main Plateau Well Locations

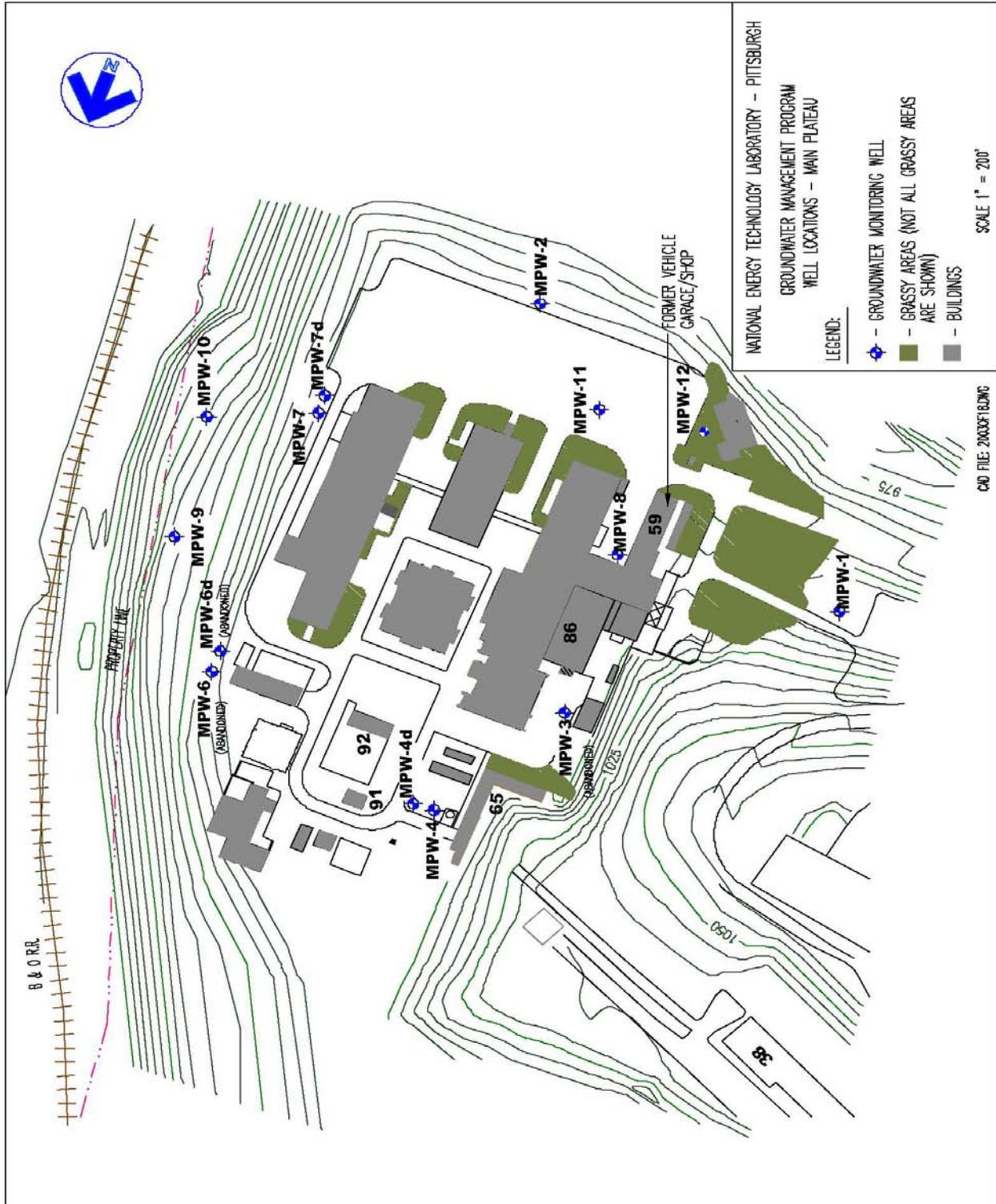


Figure 8.8.4 – NETL-Pittsburgh Groundwater Management Program Valley Fill Well Locations

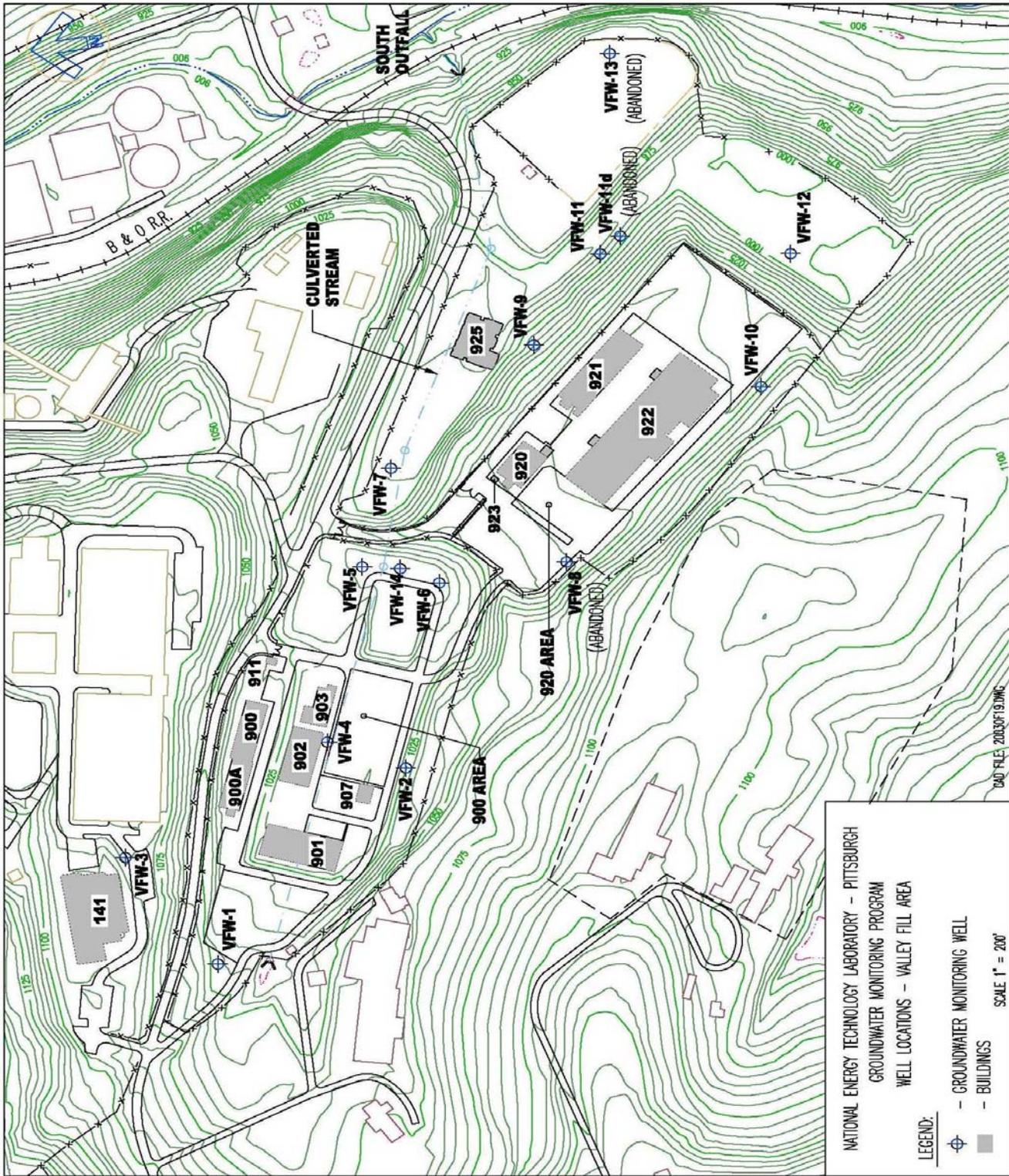


Table 8.8.5 NETL-PGH 2005 Groundwater Detection Monitoring Program – Results of Analysis

Well	Sample Date				Sample Date			
	05/11/05				10/11/05			
Constituents	pH	Specific Conductance	Temperature	TPH-DRO	pH	Specific Conductance	Temperature	TPH-DRO
VFW-2	6.63	2710	14.0	ND	7.17	11270	15.5	ND
VFW-4	6.77	2190	17.4	ND	7.07	2520	16.8	ND
VFW-7	6.71	3710	16.0	ND	6.97	5550	14.2	ND
VFW-10	6.71	2020	16.2	ND	7.07	3210	15.2	ND
VFW-11	6.72	1550	14.9	ND	7.19	2180	14.4	ND
VFW-12	6.77	1220	14.2	ND	7.09	2590	14.1	ND
VFW-14	6.71	2070	15.0	ND	6.58	7370	15.0	ND

pH unit: standard unit; Specific conductance unit: umhos/cm @ 25 °C; Temperature unit: degree centigrade
 TPH-DRO: Total Petroleum Hydrocarbons – Diesel Range Organics; ND: Non Detect

Figure 10.8 – NETL-Albany Groundwater Monitoring Well Network (July 2002)

