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National Energy Technology Laboratory

Annual Site Environmental Report

For Calendar Year 2004



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1.0 EXECUTIVE SUMMARY

The National Energy Technology Laboratory (NETL) strives to achieve the highest standards of environmental performance. Proof of NETL's environmental performance is found in the information contained within this document. This report presents both summary and detailed technical data to demonstrate NETL's performance in protecting the environment, describing incidents and responses, confirming compliance with environmental requirements and standards, and highlighting significant programs and efforts.

The purpose of the Annual Site Environmental Report (ASER) is to inform the public, U.S. Department of Energy (DOE) officials, and other stakeholders of the environmental conditions and activities at NETL's sites located in Morgantown, West Virginia; Pittsburgh, Pennsylvania; Tulsa, Oklahoma; and Fairbanks, Alaska. The ASER concentrates on the Morgantown and Pittsburgh sites, which encompass research laboratories on roughly 330 acres and which perform activities that could impact the environment. NETL's offices at Tulsa and Fairbanks are administrative offices located inside commercial and university office building space, respectively.

Both the Morgantown and Pittsburgh sites have traditionally conducted research and development (R&D) in coal utilization processes, and both have implemented the natural gas program for DOE. Both have laboratories and sub-commercial-scale development facilities. Unlike the Morgantown and Pittsburgh sites, the Tulsa office, which leads the oil program, is solely engaged in the administration of contracts with offsite organizations and has no onsite laboratories or development facilities. Similarly, the Fairbanks office is responsible for the administration of contracts dealing with energy issues in Alaska. Because there are no laboratories at these latter two locations, environmental risks associated with their onsite activities are extremely low.

During 2004, NETL employees at the Pittsburgh and Morgantown sites continued to ensure site activities were performed in conformance with the internationally-recognized International Standards Organization (ISO) 14001 standard, *Environmental Management Systems (EMS)*. Employees worked to revise or complete NETL's environment, safety, and health (ES&H) directives (orders, operating plans, procedures) so that all of the directives issued were uniform for the Pittsburgh and Morgantown sites. Many lab-specific test plans and operating procedures were also updated. In-house auditors audited most employees to determine the level at which the EMS was being implemented. When auditors discovered non-conformances, corrective actions were implemented, and follow-up audits verified successful completion of each corrective action. There were 81 findings made during the internal audits that identified non-conformance or opportunity for improvements. Of these findings, 69 have been corrected and only 12 remain open or are pending completion. Many of the findings were educational in nature (e.g., employees not fully understanding EMS processes and their roles within these processes). Results of this valuable learning experience were demonstrated by two successful ISO 14001 surveillance audits conducted in March and October of 2004.

NETL does not conduct nuclear work on its sites nor dispose of radioactive waste. The only ionizing radiation sources on site are small, sealed sources installed in various laboratory instruments and devices. When these radiation sources are no longer needed, they are returned to the instrument manufacturer. NETL has a radiation protection program for the safe usage of these small sealed sources and the monitoring of worker exposure. There is no requirement or justification for NETL to provide off-site monitoring of radiation exposure because the limited sources

on site do not emit any measurable radiation when radioactive monitoring is performed in immediate proximity to these sources. Environmental protection programs at NETL sites in Pittsburgh and Morgantown, therefore, focus on non-nuclear chemical and physical hazards that might occur as a result of laboratory work on fossil energy (coal, oil, and natural gas) projects. NETL has assisted DOE in the development of technologies for the decontamination and decommissioning of nuclear facilities, but this assistance has been provided only in the form of contract administration as work for others.

NETL protects the environment through media-based programs and through process and control programs. The media-based programs are: the Ambient Air Quality Program, the Surface Water Quality Program, and the Ground Water Quality Program. These programs establish monitoring of ground water and surface runoff water around the perimeter of the sites for the possible escape of contaminants and the monitoring of air pollution sources (i.e., stacks, vents, fume hoods) on site. Closely associated programs address industrial waste water management, spill prevention and control, and handling of hazardous materials. Various details of program implementation and pollution prevention strategy at both sites are given in the Ground Water Protection Management Plan, the Storm Water Pollution Prevention Plan, and the Spill Prevention, Control, and Countermeasures Plan.



Hazardous waste are handled according to a stringent program that ensures that laboratory waste are properly packaged, labeled, manifested, and stored temporarily until they are shipped via licensed transporters to Resource Conservation and Recovery Act (RCRA)-permitted treatment, storage, or disposal facilities. During 2004, NETL continued a program to reduce its chemical inventory by 20 percent by 2005 using fiscal year (FY) 2002 as the baseline and thereby decrease the long-term risks associated with maintaining larger inventories.

Work began on a renovation of the Chemical Handling Facility for the Pittsburgh site. This facility provides receiving and dispensing functions for chemicals and an accumulation and consolidation area for hazardous and non-hazardous waste. The renovations will minimize the risk of chemical escape by leakage and minimize the environmental impact of any explosion or violent chemical reaction inside the facility when completed sometime in 2006.

Ground water and surface water have been protected during recent years, with no new contamination occurring. In fact, the number of contaminants tested and the number of ground water wells sampled has been reduced to address only general indicators of contamination (pH, specific conductance, total organic carbon, and total organic halogens). This list is sufficient for NETL to monitor for contamination from both identified and unidentified sources. Such a generalized approach is justified by the lower risks associated with the smaller projects and the smaller quantities of hazardous chemicals that are now used on site. There were no spills directly to the environment or other environmental incidents during 2004 that triggered reporting requirements. There were two regulatory violations during 2004 involving discharge of impermissible levels of

free cyanide through the industrial wastewater treatment system. Two other incidents occurred which involved minor non-compliance not resulting in a citation. The first of these two incidents



was the accidental discharge of turbid water into nearby Lick Run caused by the underground rupture of a water line used to supply water for the site fire suppression system causing soil contaminated water to flow into the north NPDES-permitted storm water discharge system. The release of a small amount of turbid water required notification to the Pennsylvania Department of Environmental Protection. The second incident involved the improper transportation of a sealed radioactive source. The second incident was resolved by securing the appropriate license transfer immediately upon discovery of the unknown sealed source.

The significant accomplishments or activities during 2004 were:

- ES&H Directives. Approximately 100 percent of the required ES&H directives (orders, operating plans, and procedures) have been issued. 98 percent of all directives were revised on time.
- Independent Third-Party Assessments. NETL commissioned three independent assessments of its ES&H programs: (1) lockout/tag-out, (2) surface water quality, and (3) confined space entry. These assessments indicated minor non-conformances due to not following the requirements in NETL directives. The corrective actions included specific fixes, training and more rigorous annual reviews of the directives by the program participants.
- In-House Assessments. NETL management and ES&H staff conducted 24 walkthrough inspections. Additionally, ES&H staff participated in over 150 Safety Analysis and Review System (SARS) Annual Assessments for in-house R&D projects, site operations, and site facilities. The SARS assessments are the principal means of ES&H control and oversight of projects.
- ISO 14001 activities:
 - Conducted two EMS Management Review Team meetings.
 - Conducted three Internal EMS Audits.
 - Reviewed and revised as necessary 22 Environmental Management Plans (EMPs) with metrics for each EMP objective.
 - Continued to refine the EMS webpage on the NETL Intranet and the ISO 14001 webpage on the external website.
 - Maintained the EMS Roadmap (manual).

- Generated periodic regulatory reviews and posted these on the NETL Intranet.
- Underwent two successful ISO 14001 surveillance audits by an ISO 14001 registrar.
- Air Quality Retrofits. Work continued to retrofit Building 13 at Morgantown and Building 94 in Pittsburgh with an efficient ozone-depleting substance- (ODS-) free heating, ventilation, and air conditioning (HVAC) system. The new system is part of a plan to phase out the onsite uses of Class I ODSs while also increasing the energy efficiency of buildings. Work continued on other buildings to improve various parts of the HVAC systems solely for benefits in energy efficiency.
- Environmentally Friendly New Buildings. NETL is currently designing all new buildings using sustainable design principles. All new buildings when completed will meet the requirements for the Environmental Protection Agency's (EPA's) Energy Star designation and the Leadership in Energy and Environmental Design (LEED) designation. Additionally, NETL is pursuing EPA's Energy Star rating for its new Pittsburgh daycare facility, "Room to Grow," as well as the LEED certification through the U.S. Green Building Council.
- Progress in Energy Efficiency of Facilities. NETL has begun reporting, for the Morgantown and Pittsburgh sites, its energy consumption and its progress toward meeting the FY 2005 goal of a 20 percent reduction in energy use per square foot of heated/cooled floor space relative to a 1990 baseline. The energy use for FY 2004 (Pittsburgh and Morgantown combined) was 233,300 BTU/GSF, a 36.8 percent decrease from the 1990 baseline of 369,240 BTU/GSF.
- National Environmental Policy Act (NEPA) Activities. Three new or continuing activities at NETL resulted in plans for the preparation of Environmental Impact Statements (EISs) were in development during 2004, although none were completed. Three Environmental Assessments (EAs) were completed, with all three reaching a Finding of No Significant Impact (FONSI) during the year. There were approximately 444 NEPA reviews resulting in categorical exclusions.
- EMS Computer-Based Training. NETL continued to refine the new integrated CBT system. The electronic job hazard survey was revised to include items related to the EMS and NETL's environmental aspects. The training administration components were also improved.
- Affirmative Procurement. A "Green Page" was created on the Intranet for listing various recycled-content items that NETL buys, instructions on how to obtain various items, what to do to reduce the need to buy and how to dispose of selected items. Also, the "Green Cupboard" is printed in the internal newsletter each month listing excess materials that are available.
- Efforts to comply with Executive Order (EO) 13148 proved highly fruitful for more than implementation of an EMS. The EO's emphasis on pollution prevention as a means of environmental compliance is primarily fulfilled at



NETL through EMPs and the associated performance goals of these plans. Progress made during 2004 at the Pittsburgh and Morgantown sites towards accomplishing the Order's goals include:

- Reduce Non-Hazardous Waste. The target for 2004 was to generate not more than 200 metric tons, for a reduction of 69.6 percent from the baseline 1993 level of 641 metric tons. NETL's 2004 tonnage was 238 metric tons – a 63 percent reduction. This fell short of the goal set for the reduction of non-hazardous waste in 2004, and created a need for improvement at NETL if we are to meet the 75 percent reduction required by 2005.
- Reduce Hazardous Waste Generation. The target for 2004 was to generate not more than 3.23 metric tons for a reduction of 82.5 percent from the baseline 1993 level of 18.46. NETL essentially met this goal by generating 3.24 metric tons for an 82.5 percent reduction. NETL remains on schedule to meet the 2005 goal of a 90 percent reduction from 1993 levels.
- Increase Non-Hazardous Waste Recycling. By 2005, NETL should be recycling 45 percent of its non-hazardous waste, and by 2010 it should recycle 50 percent. During 2004, NETL exceeded the short-term goal by recycling 47 percent of its non-hazardous waste and is making progress toward meeting the long term goal of 50% recycling.
- Reduce Hazardous Materials Procured, Received, and Stored. NETL exceeded the target of 5,676 containers of hazardous materials in 2004 by 690 containers (4,986 actual containers). The conscientious buying and monitoring of the onsite supplies allowed NETL to reduce its chemical inventory by 24 percent from the 2002 baseline. The target was a 20 percent reduction by 2005.
- Reduce ODSs - Class I Refrigerants and Chiller Replacement. By 2010, EO 13148 requires elimination of all non-exempt Class I refrigerants from use. In 2004, two new 167 ton CFC free chillers were purchased and installed in the newly constructed roof penthouse of Bldg. 94. Electrical and Mechanical rough in work continued and will be completed prior to the cooling season March/April 2005. As of December 2004 two 225-ton Class I chillers were disconnected and taken out of service.
- Reduce Generation of Greenhouse Gases. Using emissions from 1990 as a baseline, NETL's target reduction of greenhouse gases, such as carbon dioxide, was 23.3 percent for 2004. The actual reduction was 22.67 percent. NETL's carbon dioxide emissions are associated with NETL's consumption of natural gas, elec-



tricity, and steam. This demonstrates substantial progress toward the 2005 goal of 25 percent reduction and was achieved in part by the NETL Pittsburgh site discontinuing use of the National Institute for Occupational Safety and Health's (NIOSH) coal-fired steam system and in part from both the Morgantown and Pittsburgh sites moving toward cleaner electrical energy suppliers.

- Decrease Air Emissions of Toxic Compounds. Even though its toxic releases are below the regulatory threshold to report, NETL has taken upon itself to continue to reduce its Toxics Release Inventory (TRI)-listed emissions. NETL's reduction from the 1997 baseline was 62.2 percent during 2004, nearly three times the target. Sampling and analysis, including monitoring of facility hours of operation, were conducted at selected point sources to confirm that the air emission inventories were accurate and to act as a tool to identify opportunities for reduction. Two activities helped with NETL's reductions for 2004. The first was to change from bulk dispensing of organic chemicals at the Pittsburgh site to purchasing smaller containers, such as 2-liter bottles, thus reducing potential sources of evaporation; and the second was to discontinue photo developing at the Morgantown site, eliminating the use of process chemicals.
- Conserve and Enhance NETL's Non-Industrial Land Use. NETL contracts with professional horticulturalists to plan and implement its landscaping based on cost-effective and environmentally sound practices. Native plants are used to ensure adaptability. During 2004, a study of four projects was performed for feasibility to preserve for non-industrial use. The study was completed which outlines future landscaping projects including: creating walking trails paved with coal combustion by-products; creating a composting station to deal with cafeteria and landscaping waste, thus reducing funds spent on fertilizer and reducing non-hazardous waste; and using the expertise of area universities to keep costs down by using students who are willing to help with planning and implementation in exchange for credit. These ideas will be implemented as funds become available.

2.0 INTRODUCTION

The ASER serves as a tool to provide information to the public and DOE stakeholders on the environmental conditions at NETL, including site emissions and effluents, environmental impacts both inside and outside the fence, and any significant environmental occurrences and responses during the calendar year. In addition, it provides information to DOE Headquarters on NETL's environmental program performance and confirms compliance with environmental standards and requirements such as meeting the reporting requirements of DOE Order 231.1, Environment, Safety and Health Reporting, and DOE Order 5400.5, Radiation Protection of the Public and the Environment. The development of the ASER provides an evaluation of NETL's compliance with relevant environmental laws and regulations in that much of the information reported came from interviews in which the authors asked regulatory-based questions and requested selected documents from relevant program managers.

In this report you will find summaries of NETL's regulatory compliance activities, monitoring and measurement activities, and significant facility programs and efforts. NETL takes its responsibility to the environment seriously, both inside and outside the fence. Management

commitment and employee involvement are essential to the success of NETL's environmental program, and NETL is dedicated to both.

2.1 Description of the Sites

NETL was established in December 1999 as the fifteenth DOE national laboratory. Prior, this organization was known as the Federal Energy Technology Center, which was formed from the merger of the Pittsburgh Energy Technology Center and the Morgantown Energy Technology Center. The National Petroleum Technology Office in Tulsa, Oklahoma, became a part of NETL in August 2000, and the Arctic Energy Office in Fairbanks, Alaska, opened in September 2001. R&D activities are conducted both on site and off site through in-house programs, partnerships, cooperative R&D agreements, grants, financial assistance awards, and various other contractual agreements. Historically, each site focused on different research areas and, therefore, has different environmental concerns. Furthermore, each site falls under different state and local regulation, so there are significant permit and reporting differences. An overview of each site is presented below.

2.1.1 Pittsburgh, Pennsylvania

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 70 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 buildings and office buildings. When the Pittsburgh site was first developed, the immediate vicinity was completely



rural; however, the population density and housing density has increased in recent years as new subdivisions of homes are built.

The Pittsburgh Site is a partially wooded tract with scattered industrial buildings and office buildings. Common animals, such as deer, turkey, and fox, are frequently seen on site. The west side 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 fields. Most of the remainder is residential.

With the decline of the steel industry and manufacturing, the area shifted to other industries, first “retail trade” and more recently to the “service” industry. Today the area is known for its hospitals, universities, and remnant industrial centers. 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.

2.1.2 Morgantown, West Virginia

The Morgantown site resides within Monongalia County, West Virginia, on the northern fringe 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. There are approximately 132 acres of land that make up the Morgantown site, of which 46 acres are developed as an industrial area. 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 are federal and half are site support contractors.

2.1.3 Tulsa, Oklahoma

In August 2000, the National Petroleum Technology Office in Tulsa, Oklahoma, was assimilated into NETL. This change connected DOE’s oil program, which was based in Tulsa, with its natural gas program, which was located at the Pittsburgh and Morgantown sites. The goal was to improve communication and cooperation between the research groups and to minimize duplicity. Located in the heart of downtown Tulsa, the NETL office is centrally located relative to the Nation’s oil and gas activities. The administrative offices in the Williams Center are leased by NETL from the Southwestern Power Administration (SWPA).

Tulsa primarily implements DOE’s oil technology research, development, and demonstration programs, with most efforts focused on exploration, drilling, production, and environmental

issues. All of the work focuses on the management and oversight of contracts for R&D in DOE's oil program. The Tulsa office conducts no in-house research and has no laboratories. The NETL Tulsa site has 26 federal and 21 contractor employees working to support the Strategic Center for Natural Gas and Oil.

2.1.4 Fairbanks, Alaska

The Arctic Energy Office (AEO) was established in September 2001 when NETL entered into a cooperative agreement with the University of Alaska at Fairbanks to support research in fossil fuels and power generation for remote areas. Fairbanks is located in the heart of Interior Alaska, 45 minutes by air from Anchorage and 3 hours from Seattle. AEO is located on the University of Alaska at Fairbanks campus in the Duckering Building. The Duckering Building contains various faculty offices, classrooms, and educational laboratories.

The mission of AEO is to develop an in-state resource for expansion and coordination of arctic-related research, development, and deployment in energy technology in two primary categories: (1) Fossil Energy – oil recovery, gas-to-liquids, and natural gas production and transportation and (2) Remote Power – electric power in arctic climates, including fossil, wind, geothermal, fuel cells, and small hydroelectric facilities. AEO conducts no in-house research and has no laboratories. Two federal and two contractor employees are stationed at AEO.

2.2 Discussion of Sites within the Document

Three 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 discussions among the sites. Morgantown and Pittsburgh sites are laboratories that have a broad array of environmental concerns, so they have detailed discussions below. Tulsa and the Alaska satellite office serve solely administrative functions, so less can be said about their environmental impacts and regulatory compliance activities.

2.3 Awards and Environmental Stewardship Recognition

All of the awards presented to NETL in 2004 are too numerous to include in this report. A summary of many of the awards and recognition received may be found in the National Energy Technology Laboratory Accomplishments Report for FY 2004. The following is a brief sampling of the awards and environmental stewardship recognition received by NETL in 2004. The Allegheny County Health Department (ACHD) in Pennsylvania issued NETL a three-star award for the voluntary pollution prevention practices being implemented through the environmental management system at NETL. The award, the highest under the department's Enviro Star Program, was made in April 2004, as part of Earth Day celebrations in Pittsburgh. In making the award, ACHD noted that the NETL environmental management system covers onsite research and development, site operations, and administrative support activities, and it conforms to International Standards Organization Standard 14001 requirements. NETL received a certificate signed by the Allegheny County Chief Executive and the Director of the Allegheny County Health Department, and a placard signifying NETL's role as a good neighbor and model for the community in implementing sound pollution prevention practices and programs.

NETL was recognized for outstanding performance in occupational safety and accident prevention for the eighth consecutive year. NETL received the "Quality" Safety Performance Award

from the Western Pennsylvania Safety Council, a chapter of the National Safety Council, at the 79th Annual Safety and Health Conference in May 2004. In addition, NETL site support contractors received the Outstanding Achievement Award for a twelfth consecutive year. The awards were made to organizations in western Pennsylvania that maintained the lowest U.S. Occupational Safety and Health Administration “lost workday case rates.” Having worked



579,107 person-hours, employees at the NETL Pittsburgh site recorded a rate of only 0.34.

Seven technologies developed by NETL researchers, or with support from NETL, received prestigious R&D 100 Awards from R&D Magazine in 2004. The R&D 100 Awards—sometimes called “the Oscars of Invention”—are given to the 100 most technologically significant products and processes of the year. Recognized by industry, government, and academia, an R&D 100 Award provides an important boost to new products just entering the marketplace.

NETL provided technical assistance to a consortium of

private-sector Indian organizations to help establish and commercialize a first-of-its-kind fuel management system. The system, installed at the Dahanu Thermal Power Station on India’s west coast, was instrumental in POWER magazine listing this 500-megawatt power plant as one of its “Top Plants of 2004.”

A new insulation material that will help make low-cost solid oxide fuel cell power generation systems a reality received the Stoel Rives “Utah Innovation Award.” In another project molten carbonate fuel cell technology developed with NETL support was used by the Los Angeles Department of Water and Power to receive the 2004 Environmental Achievement Award from the EPA for leadership in environmental protection.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

3.1 NETL’s Environmental Management System

NETL has implemented an EMS based on the ISO 14001 standard. NETL maintained ISO 14001 certification throughout 2004 from NSF International Strategic Registrations, Ltd., well ahead of the DOE goal to have an EMS in place before December 31, 2005. 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 seriously its responsibilities for environmental stewardship.

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 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 that management uses 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.

Management commitment and employee involvement are required to minimize oversights 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 uses the acronym PRISM to illustrate its policy (see Figure 3.2). PRISM also shows the successful incorporation of DOE's ISM within the ISO 14001 standards. The PRISM graphic is prevalent at the sites as a reminder to employees and visitors of the NETL policy.

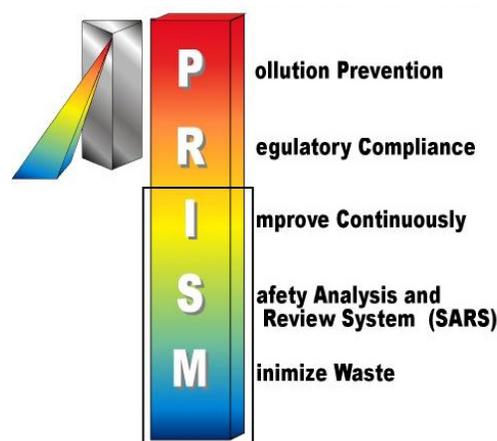


Figure 3.2.1. Illustration of NETL Environmental Policy

3.3 Identification of Environmental Aspects and Impacts

Determination of NETL’s 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 from 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 2004 registry (see Table 3.3. 2004 Significant Environmental Aspects) was approved November 3, 2003. The 2005 registry was published on November 23, 2004, and includes a report on the analysis made to select the top 10 aspects in 2004. This registry applies to the development of goals, plans, and actions for 2005.

Table 3.3. 2004 Significant Environmental Aspects
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

3.4 Environmental Objectives and Targets

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

Environmental objectives are goals that an organization sets 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 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 2004 appear in Table 3.4.

Table 3.4. 2004 EMP Objectives and Targets		
EMP	Objective	2004 Target
Aspect 1 – Waste Generation, Management, and Disposal Practices		
1.1 Non-hazardous Waste Generation	Reduce non-hazardous waste.	Generate less than 200 metric tons for a reduction of 69% from the 1993 level of 641 metric tons.
1.2 Hazardous Waste Generation	Reduce hazardous waste.	Reduce RCRA hazardous waste to 3.23 tons for a reduction of 82.5% from 1993 baseline of 18.46 tons.
1.3 Recycling	Increase the amount of recycled material.	Increase recycling of sanitary waste stream to 41%.
1.4 Construction Waste	Study the feasibility of recycling construction waste.	Modify construction contracts, processes, and language.
Aspect 2 – Energy and Fuel Use		
2.1 Energy Conservation	Invigorate the NETL Energy Management Program.	Complete B-26 lighting retrofit.
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 300 X 103 BTU/ft ² for a reduction of 19% from the 1990 baseline of 369 X 103 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 .0312 gallons per mile for a reduction of 15% 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 65% 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.	Complete 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 5,676 containers for a reduction of 14% 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 waste water treatment facility.	Zero NOVs.
Aspect 5 – Air Emissions		
5.1 Large Chillers Using CFC's	Eliminate Class I ODS refrigerants.	Replace chillers over 150 tons by the end of 2005. Zero units scheduled for 2004.
5.2 Class I Refrigerants	Eliminate Class I ODS refrigerants.	Reduce CFC inventory to 142 pounds from the 2002 baseline of 190 pounds.
5.3 Greenhouse Gases	Reduce emission of greenhouse gases.	Reduce emissions to 51.7 million pounds for a reduction of 23% 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 3,176 pounds for a reduction of 17.5% 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 28 pound for a reduction of 34% from the 2002 baseline of 42 pounds.

Table 3.4. 2004 EMP Objectives and Targets		
EMP	Objective	2004 Target
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.	No target was established for this objective since the work had been completed.
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	Determine the baseline in 2004.
Aspect 9 – Offsite Noise Generated Onsite		
9.1 Offsite Noise	Reduce fence line noise levels attributable to NETL.	No target was established for this objective since zero complaints or violations have been received for 2002-2004.
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.

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 reuse 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 which are documented in directives (Orders, Operating Plans, and Procedures). These documents are written for the purpose of describing how routine actions are undertaken to achieve the safety and environmental goals of NETL. Managerial responsibilities are attached to EMS/ES&H function titles, which are assigned according to a table of assignments. 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. An example would be swapping chillers that use ozone-depleting refrigerants for chillers that use different refrigerants. Such short-term actions do not justify revising directives, so EMPs are written. 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, Objec-

tives, Targets, Management Plans and Management Review. Each EMP specifies the nature of the action to be taken, the timeframe for the action, the responsible persons, 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. EMPs are updated, created, or terminated annually.

3.6 Implementation and Operational Controls

NETL’s EMS is implemented through an organizational structure as shown in Figure 3.6. Senior level positions include the Director, who serves as the chief responsible administrator and as a member of the Management Review Team; the Deputy Director 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.

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 those people working for them. Line managers are NETL’s chief means of operational control.

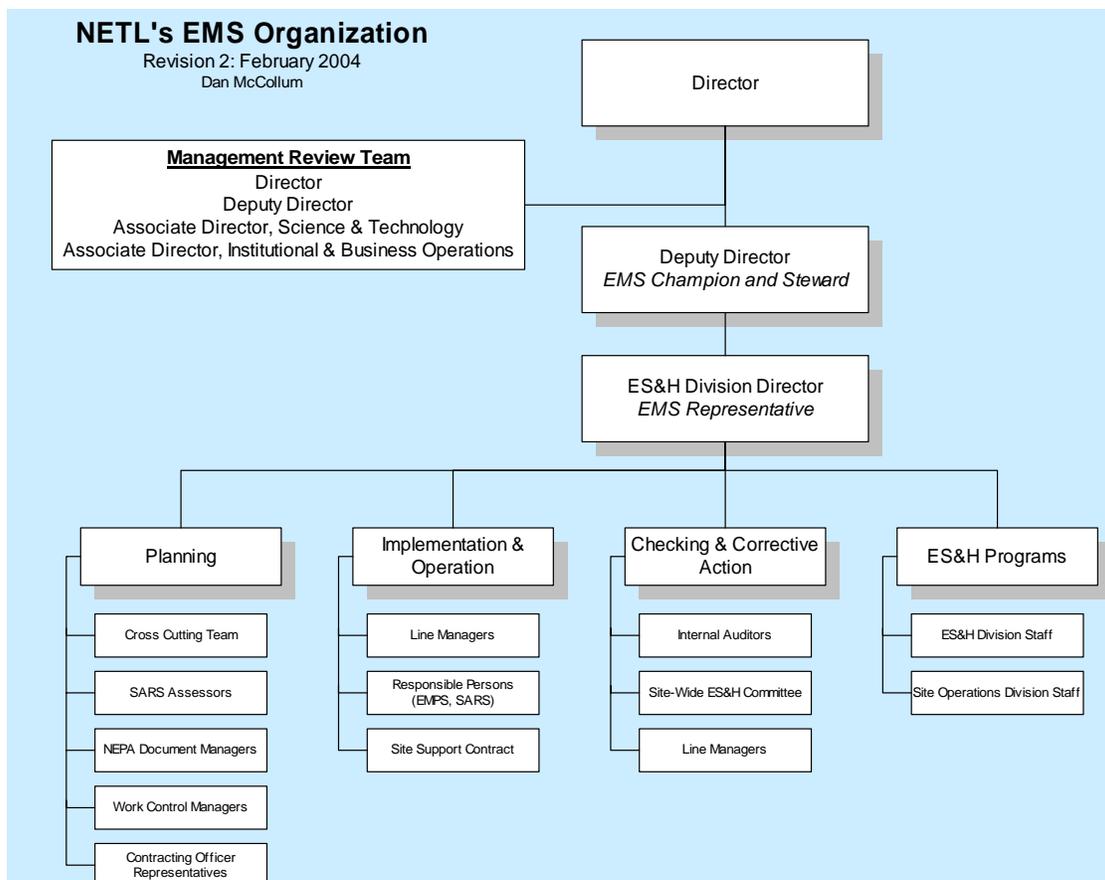


Figure 3.6.1. NETL’s EMS Organization

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 2 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 employees to see.

In addition to the Intranet, NETL communicates the EMS to its employees through training, staff meetings, email, and posters. The NETL training program includes general EMS training aimed 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 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.

In 2004, NETL continued to refine its new integrated Computer Based Training (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 contact with local community interest groups, keeps an up-to-date Internet site – www.netl.doe.gov – that has EMS information available to the public, and conducts public participation activities under the National Environmental Policy Act (NEPA) program. For projects conducted offsite, NETL uses 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. This is accomplished primarily through the Safety Analysis and Review System (SARS). The process requires proposed projects to be described in writing and subjected to reviews by various subject-matter experts and technical committees. Approval must be granted before a project can proceed beyond the planning stage. Included within this process is a review of the potential environmental impacts, regulatory requirements, safety procedures, 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, ground water) and likely pollution routes (spills). 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 2004, NETL conducted one emergency response exercise at the Morgantown site for a release of liquid nitrogen due to a failure of the nitrogen tank, and one at the Pittsburgh site involving a nitric oxide release from leaking cylinders. 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 improve the response capabilities. In 2004, Emergency Management updated the certification processes for ERO positions.
- Contract Requirements. Outside contractor work is controlled at the NETL site through procedures that spell out 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 site, a program has been established to encourage 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 removed from potential use. The NETL Intranet is being used as the tool by which up-to-date, approved, and official EMS documentation is being posted and 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 NETL 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 NETL Intranet and are reviewed and updated as required.

3.7 Performance Measures

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 Appendix A, [Table 3.7a. Environmental Performance Measures](#). The measures are based on budget cycles and thus are tracked on an FY schedule. They cover performance goals for FY 2004 – October 1, 2003, through September 30, 2004. In addition to these measures, surveillance monitoring is conducted through routine reviews and inspections. This monitoring is presented in Appendix A, [Table 3.7b. Surveillance Monitoring](#).

3.8 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 (NETL Procedure 450.4-14, EMS Auditing). To maintain 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 2004, 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., OSHA regulations, National Fire Protection Association (NFPA) code, National Electric Code (NEC), and environmental requirements). The status of corrective actions resulting from the walkthroughs is provided to senior management quarterly.

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., Water Quality Program, Air Quality Program, and the Ground Water Program). These reviews are informal and may vary in scope and detail. During each review, the program manager attempts 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 (see Appendix A, Table 3.7b. Surveillance Monitoring), 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 waste water discharge points. Quarterly discharge monitoring reports are compiled and

reviewed to see if any exceedences have occurred. 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 plus the changing 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 several 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). Currently, NETL staff is testing the possibility of using various on-line regulatory help sources.
- 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.

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 aim to provide a fresh 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 2004 were the Lockout/Tagout Program, Surface Water Quality, and Confined Space Entry. Recommendations for improvement include the following:

- Lockout/Tagout. Complete refresher training as needed on the administrative requirements for inventory of lockout/tagout locks. Review surplus and out-of-service research facilities to insure that project locks have been installed, or the facility made safe by some other means, such as disconnecting power sources. Re-visit the requirement for dating lockout tags, to see if there could be some flexibility in that regard. Prepare a local inventory sheet for locks kept at the LO/TO boards. Provide additional training to credit card purchasers, to insure that energy isolation requirements for equipment are addressed in the design of the equipment that is being purchased. Investigate the extent of need for equipment-specific LO/TO procedures.
- Surface Water Quality. Develop and implement a recordkeeping system at Morgantown that would track the individuals who actually perform the routine inspections that are recorded. In the unlikely event of legal proceedings, that information should be verifiable. Consider having an ES&H representative(s) attend the routine construction meetings at Morgantown, to be consistent with Pittsburgh. This would help to insure that environmental aspects which are associated with planned construction are addressed early in the project life-cycle. Incorporate Erosion and Sedimentation Plan requirements into the NETL Surface Water Quality Management Directive.
- Confined Space Program. Permits must always be cancelled when the entry is completed. The water meter pit at Building 900 is posted with a confined space notice.

Non-conformances generated from all of the self-assessment audits mentioned above are documented using the AIIS database. 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. All NETL employees have access to AIIS, and instructions on the use of the system have been communicated.

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 cause, 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 for dissemination of lessons learned across appropriate organizational elements at NETL.

In brief, after completion of an assessment, the lead assessor uses the AIIS database to generate an assessment record, which is identified by a unique number. Each member of the assessment team can then enter individual findings and concerns that require corrective action. 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.

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/illness and property damage investigation and reporting for NETL.

3.9 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 environment. The QA Program is based on DOE's ISM principles and core functions.

Line management accountability for ES&H issues is an integral part of the QA Program and ISM. NETL implements this through work performance goals that are applied to all line managers. Internal assessments and audits also help to ensure that line managers are held 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 is generated from this process; therefore, it is important that it work effectively. NETL has three SARS processes: R&D, facility, and support operations.

NETL's 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.

An annual SARS Review is conducted on all SARS-permitted onsite 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 shall be corrected within 7 days; priority 2 findings are serious deficiencies – 45 days; priority 3 are non-serious – 120 days; and priority 4 findings are de minimus – 365 days. After assignment, findings are sent to the Responsible Person for resolution and to the responsible line manager as notification using the AIIS database for tracking.

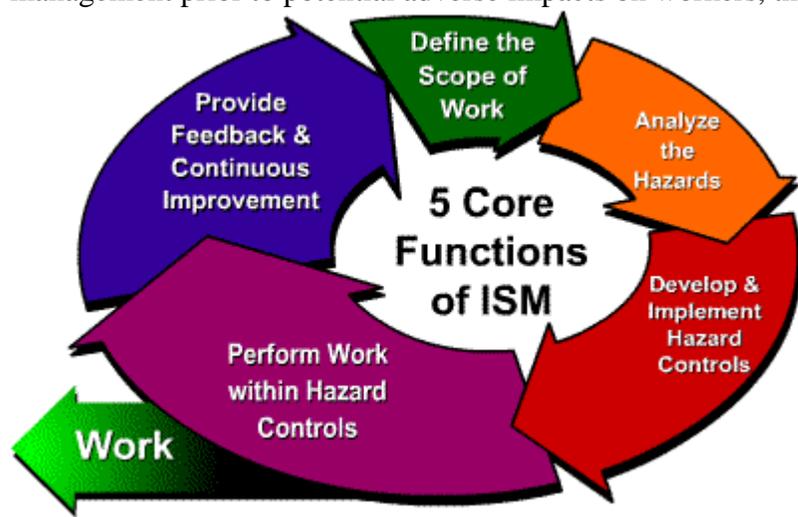
NETL's Facility SARS procedure (NETL P 421.1-3) covers onsite facilities including buildings, trailers, utilities, services, structures, roads, and walkways. The purpose of this safety analysis and review is to ensure that facilities are constructed, maintained, and modified in compliance with applicable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

An annual ES&H assessment is completed on 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, Chemical Hygiene Officer, Environmental Manager, and Life Safety

Officer. Findings are assigned a priority based on significance and recorded in the AIIS database for tracking.

In 2004, the facility SARS procedure was revised as a result of a surveillance audit finding to include the requirement to mark outdated documents as “historical information.” An explanation that the ISO 14001 forms should only address environmental aspects/impacts associated with the facility and not the project or support operation within the facility was also added. A statement that the quality of the facility SARS document is the responsibility of the RP and the RP’s supervisor was added to the quality control section.

NETL’s support operations SARS procedure (NETL P 421.1-2) covers onsite support operations (construction, operation, maintenance, renovation) and ensures that associated risks are analyzed, understood, and eliminated, mitigated, or controlled to a degree acceptable by responsible line management prior to potential adverse impacts on workers, the public, the environment, facilities, or 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 effectiveness of controls.

In 2004, the Support Operations SARS procedure was revised as result of a finding from a surveillance audit to include the requirement to either archive the historical documentation in the SARS file or to mark the outdated information contained in the SARS file as “Historical Information.” Also, changes were made to explain that ISO 14001 forms (Scoring Matrix and Screening Analysis Questionnaire) are to only consider the environmental aspects and impacts directly related to the support operations and not those associated with the facility which will be considered in the facility SARS review.

3.10 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 2. NETL’s EMS Organization](#)). During the review meetings, the Management Review Team considers the environmental policy, objectives and targets, internal and external audits, and other related issues. Changes are documented and implemented. Management involvement guarantees the projects are funded and the appropriate priority is placed on the issues that are identified.

MORGANTOWN, WEST VIRGINIA

4.0 MAJOR ACTIVITIES IN 2004

Following is a brief discussion of the major activities that occurred at the Morgantown site and their impact.

4.1 Detailed Design of the Technology Support Facility

NETL completed the design of a major new building being identified as the Technology Support Facility. This new facility is expected to have construction started in August 2005. It is designed to utilize sustainable design principles, which means that when the new building is completed it will meet the requirements for EPA's Energy Star designation, and the LEEDs designation. Work completed in 2004 included development and acceptance of a Title I and II design work. Title I involved the conceptual architectural design for the facility and included 326 separate design drawings. Title II involved engineering design and addressed the mechanical, electrical, plumbing and HVAC systems to be included in the new facility.

4.2 Parking Garage Completed

A new five story parking garage was completed in 2004 and was made open for use in early 2005. The garage was constructed using prefabricated concrete components which significantly reduced the cost of construction. The garage is equipped with pedestrian bridges that connect the 3rd floor West and 2nd floor East with the adjacent parking lot. An elevator serves all five floors of the garage. The parking garage contains 347 numbered spaces, including nine spaces for handicapped parking. The garage also contains twenty-one unnumbered motorcycle/bicycle spaces. The garage accepts vehicles reaching a ceiling height of eight feet or less which is approximately the same height as a standard home garage door.



4.3 Building 2 and 3 Roof Repair and Replacement

Routine inspections revealed several leaks in the roofs of Buildings 2 and 3 had their roofs renovated. Rather than incur the expense and time required by a complete roof renovation, it was determined that the leaks could be eliminated by replacing only a part of these roofs. This limited renovation involved reviewing building specifications to ensure protection of existing electrical, plumbing, ventilation, and fire protection systems along with the removal of damaged or worn materials followed by replacement with new material. The Building 2/ Building 3 Roof Renovation Project and all Modifications are 100% complete.

4.4 Building 13 HVAC Installation

NETL created a special laboratory space to perform a new research process in Building 13 that placed added demands on the existing heating and ventilation systems (HVAC). The added demands involved additional cooling control required by the new research operations. A new

CFC-free HVAC system was installed into the building and more efficient ductwork was used to distribute the added cooling to the building.

4.5 New Emergency Generator in Building 2 Computer Room

Due to the federal reliance upon information resources at NETL, a decision was reached to install emergency backup services to the site computer center. This involved the design and construction of a weather proof enclosure used to house a large 450 KW emergency generator. The weather proof enclosure is deemed to be a temporary structure used to ensure that emergency power is available to the computer room while the new Technology Support Facility is being constructed. The computer room will be relocated to the new Technology Support Facility when construction is complete and the emergency generator relocated to a permanent location in the basement of that facility at that time.

4.6 Refurbished High Pressure Boiler Stack at Building 5 Boiler Room

Due to life cycle deterioration of the existing stack, it was determined that the old stack needed to be replaced. Refurbishment of this stack included replacement of the foundation, the stack and guide wires. On-going operations in the laboratory are now capable of performing safely without disruption for unscheduled delays due to maintenance on this structure.

4.7 Steam Coil Replacement in Building 26

NETL was able to tolerate continual maintenance of the deteriorated coil until 2004 when it was determined that this unit had exceeded the life cycle established for the coil. As a result, the coil was replaced with an exact duplicate of the existing coil so that the deteriorated coil could be replaced without disruption to on-going research operations.

5.0 ENVIRONMENTAL COMPLIANCE

5.1 Compliance Assessment Process

The best way to ensure continued compliance is through frequent and comprehensive assessment. NETL has several processes in place to perform environmental compliance assessments including SARS reviews, program reviews, regulatory agency inspections, management walkthroughs, external audits, and in-house audits. These processes are discussed in detail in Sections 3.8 and 3.9 of this report.

In addition to NETL's internal efforts toward quality assurance, regulatory agency inspections are conducted at the discretion of the agency and may include only selected subsets of the regulatory jurisdiction of the agency. These inspections are sometimes announced in advance or are periodic, but occasionally they are a complete surprise. Inspectors from regulatory agencies have thorough knowledge of the applicable regulations under their jurisdiction, so their inspections are the most valuable from a compliance assurance viewpoint.

On June 21, 2004, the Morgantown Utility Board (MUB) conducted their annual inspection of NETL's industrial wastewater system. A regulatory inspection was performed on December 29, 2004, by the WVDEP Division of Water & Waste Management. No areas of non-compliance were found as a result of either inspection.

5.2 Compliance Status

5.2.1 Summary of Permits

A summary of environmental permits for the Morgantown site is provided in Table 5.2.1.

Table 5.2.1. 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	07/01/2004 to 06/30/2005	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 Waste Water Discharge Permit	07/01/2000 to 06/30/2005	MUB	This permit allows for the operation of waste water 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 Ground Water 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.

5.2.2 Environmental Restoration Activities

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-type Offsite Cleanups. There were four offsite remediation activities that were ongoing during 2004. All four sites have volatile and semi-volatile compounds in the ground water 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.

The largest cleanup activity during 2004 occurred at the Rock Springs Oil Shale Retort Project at Rock Springs, Wyoming. Cleanup activities were ongoing at Sites 4, 5, 6, 7, 9, and 12. Finalization of a bioaugmentation process was completed at Site 12, with the addition of an enhanced

indigenous microbial population and nutrients. The second largest cleanup activity occurred at the Hoe Creek Underground Coal-Gasification Project near Gillette, Wyoming. At both Rock Springs and Hoe Creek, cleanup was undertaken in 2004 by air sparging and in-situ bio-remediation. Contaminant levels continue to be reduced at each site, with BTEX compounds showing reductions of approximately 83 percent at Rock Springs and 98 percent at Hoe Creek. Ground water has been returned to its original class of use and has been restored to baseline conditions at the Hoe Creek II Site. The Wyoming Department of Environmental Quality (WDEQ) has granted approval to plug and abandon all Hoe Creek II wells and reclaim the surface. Hoe Creek III will continue air sparge activities during 2005, at which time it will enter a 12-month stability monitoring period.

Cleanup activities were also undertaken at the Rocky Mountain I Underground Coal-Gasification Project and the Hanna/DOE Underground Coal-Gasification Project, both located near Hanna, Wyoming. At these two sites, the ground water and soil cleanup actions have been completed to the satisfaction of WDEQ using conventional pump-and-treat processes coupled with activated carbon filters. In 2004, DOE undertook a sampling and analysis of the re-vegetated areas, as required by WDEQ, for the closeout phase and reclamation performance bond release. Evaluation of the previously disturbed re-vegetated areas resulted in approval by WDEQ for reclamation performance bond release. A public notice will be advertised in the local paper and landowners will be notified that the WDEQ has approved the bond release for the Rocky Mountain I Underground Coal Gasification Site. The Hanna DOE site will initiate re-vegetation evaluation in 2005.

Additionally, there were three decontamination and decommissioning (D&D) activities that were in the closeout phase with demolition occurring soon. The Air Products Laboratory D&D Project has completed cleanup of contaminants from bench-scale tests of coal gasification processes at the Allentown, Pennsylvania, facility. At this site, improper handling of byproducts and cleaning solvents led to the contamination. Elsewhere, pilot-scale gasification plant operations led to contamination at two other sites: the Air Products Gasification Facility D&D Project in La Porte, Texas, and the Foster-Wheeler Gasification Facility at Livingston, New Jersey. Equipment and contaminated areas have been removed at the LaPorte, Texas, facility. For all three D&D sites, the contaminants are primarily coal tars. Swab sample tests in 2004 indicated that the coal tars contain phenolic compounds and other semi-volatile (non-chlorinated) hydrocarbons.

CERCLA/Superfund Amendments and Reauthorization Act (SARA) Onsite Cleanups. The Morgantown site of NETL had no National Priorities List (NPL) sites in 2004, 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 2004.

During the past 25 years, there have been several onsite cleanup activities. Some of these activities followed the closure of facilities that had apparently leaked for a number of years. Other cleanup activities followed discrete spills. Table 5.2.2a. provides an overview of these events in terms of the source, contaminants, and current status of the site. A list of the specific chemicals or materials of concern is presented in Appendix A, [Table 5.2.2b. Properties of Potential Contaminants.](#)

Table 5.2.2a. 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.
Waste Water Pond 001	Coal Tar Polynuclear Hydrocarbons, BTEX, metals	Removed 1995; site filled and regraded.
Waste Water Pond 002	Coal Tar Polynuclear Hydrocarbons, BTEX, metals	Removed in mid 1980s.
Waste Water 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.

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 waste water 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 waste water. The leak was repaired and a leak detection system was installed. No regulatory actions or complaints resulted.

RCRA Cleanups. The NETL Morgantown site has never had a non-UST RCRA corrective action and, when last checked, was not on the Corrective Action Report (CORRACTS). For purposes of RCRA regulation, the Morgantown site is a large quantity generator, which is defined as an entity that generates in any month more than 1,000 kilograms of non-acutely hazardous waste or more than 1 kilogram per month of acutely hazardous waste. Therefore, Morgantown is found on the RCRIS-LQG (Resource Conservation and Recovery Information System for Large Quantity Generators) database.

During 2004, there were no RCRA spills or releases, no remediation actions, and no special surveillance actions. Ground water monitoring is conducted routinely and provides base-level surveillance for the entire site.

As indicated in Table 5.2.2a, an underground storage tank removal project was undertaken during and prior to 1991 to properly close several fuel and waste oil tanks. Tank sites were assessed for soil contamination at the time of tank removal. Soil contamination was found and was removed as part of the closure activities. Subsequent ground water monitoring has not detected the presence of dissolved petroleum fractions.

Federal Facilities Compliance Act Actions. The Federal Facilities Compliance Act waived sovereign immunity for the federal government executive agencies regarding the payment of fines and civil penalties for violations of RCRA. However, it permitted executive agencies to avoid RCRA's land storage ban on mixed radioactive waste. It gave EPA explicit authority to issue compliance orders to federal agencies for violations of RCRA. It also requires EPA to conduct an annual inspection of every federal facility that has a RCRA Treatment, Storage, and Disposal (TSD) permit. The Division of Water & Waste Management, WVDEP, conducted a surprise inspection on December 29, 2004. All areas were found to be in compliance with the appropriate regulations. The EPA did not levy any civil fines on NETL in 2004. Because NETL does not own or operate any TSD facilities, the annual inspection provision does not apply. NETL does comply with local and state laws regarding the handling of hazardous waste and is subject to civil penalties for violations.

TSCA Actions. There were no reported spills or releases of TSCA regulated substances [e.g., pesticides, polychlorinated biphenyls (PCBs), formaldehyde, methylene chloride], other than asbestos. However, there has been an ongoing program of asbestos removal or encapsulation during recent years. Most of these actions are small, such as the removal of asbestos coverings from sections of pipe prior to making a plumbing repair. Asbestos abatement work is performed by an asbestos remediation contractor who utilizes trained and certified technicians. NETL requires that asbestos abatement firms provide copies of certificates to the Asbestos Program Manager. The contractors provide for the disposal of asbestos and provide NETL with a manifest after they have shipped the waste to a disposal facility. NETL office workers are not exposed to asbestos hazards during their routine work. Abatement work is performed to minimize the risk to NETL maintenance workers who would perform maintenance work at these locations.

FIFRA Actions. During 2004, there were no restricted-use pesticides, herbicides or defoliants kept on site. Only general use pesticides were kept and used for routine insect control. The NETL ES&H Division is not aware of any spills or releases of FIFRA regulated substances (e.g., pesticides, herbicides, defoliants).

5.2.3 Waste Management and Pollution Prevention Activities

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 Tables 5.2.3a through 5.2.3c 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 2004, hazardous waste were transported to the storage and treatment facilities of American Environmental Services (AES), Inc., located in Westover, a town adjoining Morgantown. At the AES facility, small packages of similar waste are combined and repackaged for more cost-effective shipment to a final disposal facility selected by AES. Non-hazardous waste (normal office waste that are not recycled and cafeteria waste) are transported by Browning Ferris Industries (BFI), Inc., to the Meadowfill landfill, located near Clarksburg, West Virginia.

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.

Table 5.2.3a. 2004 Hazardous Waste Generation NETL-Morgantown		
Waste Stream	Quantity Generated (lbs)	Quantity Shipped (lbs)
Lead Paint Chips	0	0
Waste Mercury	25	25
Waste Paint	1310	1310
Photographic Lab Water	60	60
Propane Cylinder	5	5
Waste Chemicals (Labpacks)	1143	1143
TOTAL	2543	2543

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 2004, 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 await 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, corrosivity).

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. Waste 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 would dispose of 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 members sample waste water discharges monthly for metals, various organic compounds, pH, BOD, total suspended solids, and TOC. A full suite of chemical analyses are conducted on waste water annually. If anomalous readings are obtained during the monitoring of the dedicated laboratory waste water sewer system, troubleshooting begins. If necessary, Morgantown ES&H staff will sample fixture traps and drains to locate the source of chemicals. Spill kits are provided in areas where chemicals are handled. Floor drains are connected to the on-site



pretreatment facility, where there is a possibility for NETL staff to detain and neutralize spilled chemicals.

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 to 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. That 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 holding acids and bases as lab feeds. For the GPDU, there is one tank holding sulfuric acid (H_2SO_4) at a 93 percent concentration, and there are two tanks holding sodium hydroxide ($NaOH$) at 50 percent and 20 percent concentrations. For these tanks, the sump water (which should be only rainwater) in the secondary containment is monitored before discharge. If the pH of the rainwater collected in the sump is outside the normal range, it is discharged to the clarifier for pH control prior to discharge into the municipal sewer system. 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 encased in PVC pipes which slope back to the secondary containment pits to prevent soil contamination.

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 means of 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 in the hazmat team and 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 2004, hazardous waste management inspections focused on proper control of hazardous materials within the lab spaces. Findings were entered into the AIIS tracking system and included improper disposal of aerosol cans, and mislabeling of trash containers. One finding involved the improper disposal of "office" hazardous waste, i.e. items such as white-out and batteries. There were also findings of personal waste such as containers of hair-spray. Instead of disposing of these in an uncontrolled container, now these waste are taken to the storeroom to a controlled satellite accumulation area. Alkaline batteries are still collected throughout the office buildings for recycling. All findings have been corrected.

On December 29, 2004, the WVDEP Division of Water & Waste Management conducted a surprise inspection. No areas of non-compliance were found.

TSCA Program. During 2004, the Morgantown site housed only small amounts of TSCA regulated substances. Some asbestos remains on site as building materials. There was an estimated one gallon of formaldehyde that had been used for pickling organisms, plus small amounts of general use pesticides. The formaldehyde is stored within double containment in one of the labs. No PCBs are kept on site for lab use. It is believed by ES&H staff that all PCB-containing devices have been removed from site.

Asbestos is the most abundant TSCA-regulated substance on site. Most is contained within "Cemestos" (cement-asbestos) wall panels found on the exteriors of several lab buildings (B-2, 3, and 4). Asbestos within these panels is well encapsulated by the cement admixture. Air monitoring has revealed no shedding of asbestiform fibers from the Cemestos panels. Occasionally, visual inspections are conducted to check the overall condition of the panels, and the panels have proven to be durable and non-friable. B-1 has Cemestos panels on the clerestory located on top of the building. These panels have been encapsulated in paint-like material as a precaution. B-1 also has asbestos deposited inside the cavities of some hollow concrete block walls. This asbestos is effectively isolated from building occupants and is readily accessible only from the top of the walls, above the suspended ceilings. Most asbestos has been removed

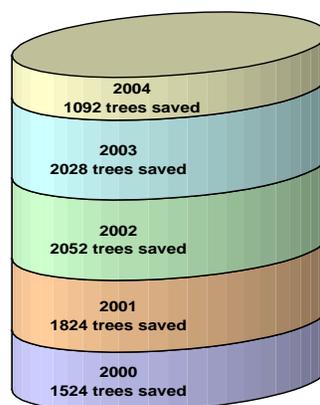
from outdoor pipes, where it had once been installed. However, asbestos is found in some patches on the pipe insulation, requiring testing each time a patch is disturbed. Furthermore, asbestos is found on site in some pipeline gaskets and in some lab device refractories, and asbestos-containing bricks line the inside of the boilers in B-5. During 2004, there were no new discoveries of asbestos on site. Asbestos abatement activities are mentioned above in section 5.2.2. on TSCA remediation activities.

FIFRA Program. During 2004, there were no restricted-use pesticides, herbicides or defoliants kept on site. Only general use pesticides were kept and used for routine insect control. A commercial pest control company provides routine insect control applications where needed around the cafeteria, buildings, and trailers. Terminix, the contracted pest-control company, reportedly had applied restricted use insecticides sold under the brand names of Suspend(R) SC and Demand(R) CS. These pesticides contain the active ingredients Deltamethrin (4.75%) and Lambda-Cyhalothrin (9.7%), respectively. Both substances are restricted to use by commercial applicators because both are extremely toxic to fish and aquatic invertebrates and both are highly toxic to bees. Herbicides were not sprayed on the lawns during 2004 by NETL staff, and the Site Operations Division staff believe that contracted gardeners do not use herbicides during their efforts.

NETL's Pollution Prevention Program. NETL integrates pollution prevention into its daily work and planning activities. Examples were given above in the RCRA section regarding the on-site search for chemicals before more are purchased, and the recycling of some semi-hazardous materials. At NETL, pollution prevention is used in a broad sense to refer to judicious purchasing, the purchasing of less toxic substitutes, procurement of goods manufactured with recycled content, onsite recycling efforts, the purchase of electricity from less polluting sources, maximizing the energy efficiency of buildings, and implementation of an EMS with continual improvement. The program is implemented in accordance with NETL Procedure P 450.1-10, *Waste Minimization, Pollution Prevention, and Recycling Program*. "It is the NETL policy that waste[s] generation shall be prevented or reduced at the source, whenever feasible. Waste whose generation cannot be avoided shall be recycled in an environmentally safe, compliant manner, whenever feasible. Disposal or other releases of waste into the environment shall occur only as a last resort..." The Waste Minimization Coordinator oversees the source reduction efforts and the recycling programs. The idea is to create a culture of waste minimization and pollution prevention by training the employees and facilitating the processes. Computer-based training is provided; messages about recycling, affirmative procurement, and source reduction are posted on the Intranet; and the Waste Minimization, Pollution Prevention,

Trees Saved by Recycling NETL Paper Waste

NETL saved 8520 trees since the year 2000



safe, compliant manner, whenever feasible. Disposal or other releases of waste into the environment shall occur only as a last resort..." The Waste Minimization Coordinator oversees the source reduction efforts and the recycling programs. The idea is to create a culture of waste minimization and pollution prevention by training the employees and facilitating the processes. Computer-based training is provided; messages about recycling, affirmative procurement, and source reduction are posted on the Intranet; and the Waste Minimization, Pollution Prevention,

and Recycling Program guidance document is updated annually and made available on the Intranet to emphasize the benefits of NETL recycling. Key requirements of the Waste Minimization and Pollution Prevention Plan are the establishment of goals for reducing the volumes of various waste streams, tracking and reporting of material usage and waste generation for comparison with the goals, employee awareness training, and specific pollution prevention opportunity assessments. Key requirements of the Recycling Plan are the implementation of collection programs for recyclable materials, the sale or donation of recyclable materials, and employee awareness training. NETL's principle recycling programs are: (1) aluminum cans, (2) corrugated paper, (3) mixed office paper waste, (4) leaf waste, (5) scrap metal, used newspapers, (6) and used magazines. Contractor employees pick up these materials at designated accumulation areas and transport these materials to the recyclables management area or the compost bin (for leaf waste). Arrangements are then made for the sale, donation or onsite use of these materials. Scrap metals (steel, copper, aluminum) are accumulated in designated dumpsters. Magazines, newsprint, telephone books, plastic bottles and wooden pallets are also recycled on an opportunistic basis (which occurs most of the time).

A few examples of new pollution prevention or recycling initiatives at the Morgantown site are presented below. Other examples are provided throughout the text of this document.

- NETL (Pittsburgh and Morgantown) is purchasing low-volatile paints, instead of high-volatile oil-based paints.
- NETL contracted with offsite paint shops where paint volatiles are either captured or burned. NETL does not have a paint booth where volatiles could be captured.
- Morgantown eliminated all photo lab processing waste by converting the photo lab to an all digital system.
- Morgantown recycled packaging peanuts on site, and sent the excess to offsite consumers.

Many of the principle pollution prevention activities are addressed by the EMPs, as outlined in Table 3.4.

5.2.4 Radiation Protection Activities

Ionizing Radiation Program. When people think of DOE laboratories, most think of nuclear weapons facilities. But DOE does much more, such as R&D for the improved usage of coal, oil and natural gas. NETL performs no work for nuclear weapons – in fact it has no nuclear programs of any type, except for contract administration of the development of some methods and tools for cleanup of sites contaminated with nuclear program materials. Tests of these cleanup technologies occur at other facilities, which have contamination problems. None occur at NETL.

Use of radioactive materials at the Morgantown site is limited to X-ray generating devices and research instrumentation that contain sealed radioactive sources. NETL does not generate, process, or treat radioactive waste; nor does it have on site any permanent disposal facility. An inventory of radiation sources is actively maintained by the Radiation Control Technician and monitored by the Radiation Safety Officer. Information is listed 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, *Radiation Protection Program*, provide the applicable

regulations and requirements. In addition, best management practices are found in DOE Implementation Guides and EPA information.

Table 5.2.4a. lists the radioactive sealed sources in use at Morgantown during 2004. NETL did not release any radionuclides into the environment. All of the radioactive sources are sealed and are used in instrumentation. In Morgantown, there is one radiological control area, which contains the X-ray mail room scanner. This x-ray scanner is a radiation generating device but not a radionuclide containing device. The x-rays are generated by electricity, so the scanner is not listed in Table 5.2.4a. In addition to the mail scanner, there are two electron spectroscopy chemical analyzers in B-25. There are four phosphorescent exit signs that constitute the largest sources on site, with each emitting 20 curies of radiation from tritium source material. When NETL no longer wants nor needs a sealed source item, NETL preferentially returns these items to the instrument manufacturers. During 2004, the Morgantown site sent no radiation source items to either storage/disposal facilities or the manufacturer.

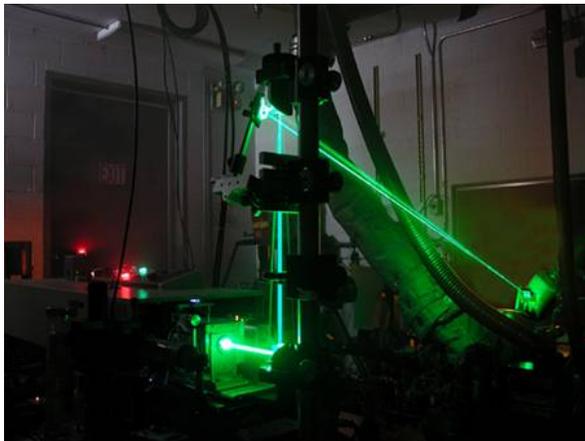
Radiation monitoring performed at NETL consisted of a limited number (approximately 12) of personal dosimeter badges (thermo-luminescent detectors) supplied to each person listed as a source custodian. During 2004, there were no exposures and all badges registered zero exposure (i.e., only background radiation). Every person was found to be below the OSHA exposure limit for the year (1 rem), in fact all personnel showed zero exposure from the NETL sources. In addition, the single radiological control area has a dosimeter badge continually exposed. Leak testing is performed when due every six months on all applicable sealed sources. None of the testing or monitoring performed detected any radioactive material leakage during 2004.

Table 5.2.4a. Morgantown Radioactive Materials Inventory December 2004			
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

**Table 5.2.4a. Morgantown Radioactive Materials Inventory
December 2004**

Isotope	Activity/Date Determined	Source	Location
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

Laser Program. There are many lasers at the NETL sites. Most of these are built into common office devices such as laser printers, CD readers within personal computers, fiber-optic communications lines, etc. Because these lasers are built into devices which protect the consumer by



engineering design, these laser are rated as Class I. Laboratory applications on site use the more powerful Class II, III and IV lasers. An example of Class II lasers are the laser pointers used on site by speakers during lectures and presentations. It is noted that the typical laser pointer that the public buys at the local office supply store or department store is a Class III laser, a laser that is capable of damaging living tissue. Class II lasers are used in NETL laboratories for sensing applications, which typically feed into control devices, but mostly they are used for alignment of various devices.

Class III lasers are used in the laboratories for sensing applications, measurements and imaging. Class IV lasers are used for the same applications as Class III lasers plus ignition of fuels (like a spark plug). Class IV lasers can burn or cut materials.

NETL currently uses ANSI Z136.1-2000, *Standard for Safe Use of Lasers*, as the reference document for laser safety. NETL abides by the OSHA standards 29 CFR 1910.132 for personal protective equipment and 29 CFR 1910.133 for eye and face protection. OSHA provides guidance on the safe use of lasers within STD 01-05-001, Publication 8-1.7 (Aug. 5, 1991). No permits are required for the NETL lasers, and there is no requirement for an inventory of lasers

on site. Currently, NETL provides basic training through a CBT module and through lecture-based training. Refresher courses are provided every 3 to 5 years for operators of Class III and IV lasers. Protective glasses or goggles are provided, and interlock warning systems are placed on Class IV lasers. During 2004, there were no mishaps or environmental impacts associated with NETL lasers.

Current laser applications include the development at NETL-Morgantown of laser spark plugs for reciprocating engines burning natural gas. These engines would be used for distributed power generation, with the laser spark plug providing benefits of lower maintenance costs and lower tailpipe emissions. Planar Laser Induced Fluorescence (PLIF) is a technology used at NETL-Morgantown for studying fuel mixing in turbulent flows within natural gas burner nozzles inside gas turbine engines. Laser Doppler Velocimetry (LDV) is used onsite to study particle flows in gasifiers and coal combustors and turbulent flows for fuel mixing.

5.2.5 Air Quality and Protection Activities

The first of three environmental media protection programs is the NETL Ambient Air Quality Program, which is administered by the site's Air Quality Manager. 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, 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 (No. R13-1786) from WVDEP for construction of the GPDU. Monitoring activities during 2004 required by the permit were limited to recording the run time of the GPDU. See Appendix A, [Table 4.1. 2004 Quarterly Operations and Emissions Report](#), for further details.

Elsewhere on site, NETL staff began sampling the emissions of TRI-listed compounds in laboratory fume hoods and flues as part of the ISO14001 efforts. Under EMP 5.5 various sampling devices were employed to sample organic compounds within the ductwork and stacks. These investigations aimed both to identify the various compounds in the vents and to measure the emission rates of these compounds. Site personnel placed within the flues and hoods five-liter evacuated canisters having a nickel lining. Organic compounds adsorb to the nickel and desorb as a function of partial pressure and relative affinity. After the sampling period, each canister was sent to a contracted testing laboratory, where the contaminants were desorbed and measured. The results of the hood emissions monitoring activities may be used for a future EMP aimed at reducing NETL's emissions, as part of the Assistant Secretary'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 creates and reports annually 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 aim to reduce its emissions of ODSs. One seeks to phase out NETL's use of Class I ODS in smaller appliances such as drinking water fountains; the other attempts to replace selected large chillers that air condition large office buildings. A third EMP aims to reduce emissions of volatile organic compounds (VOCs) from paint operations. NETL has begun to contract more spray painting of small parts to local commercial paint shops that have paint booths with VOC capture or abatement devices. A fourth EMP deals with vehicles, where the aim is both to reduce the consumption of petroleum products and to reduce emissions of vehicular air pollutants.

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 through the WVDEP website's Air-quality Index and through the EPA AirNOW web-based system. During 2004, 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 the PM_{2.5} criteria. It is believed that the NETL site is not a significant contributor to ambient air quality problems.

During 2004, there were no New Source Reviews (Clean Air Act Pre-Construction Reviews) for any NETL-Morgantown facilities. Nor were there any Morgantown facilities with the potential to emit more than 100 tons/year of any designated air pollutant. WVDEP does 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). There are four permitted stacks for the GPDU, and each stack has a permitted maximum hourly emission rate for particulate matter, sulfur dioxide, carbon monoxide, nitrogen oxides, and VOCs. The permit also caps annual emission quantities for the GPDU as a whole and for each stack other than the flare, which has other restrictions. The permit requires official emission testing of the main stack for particulates and sulfur dioxide after shakedown testing is complete. Best available control technology (BACT) is not required. During 2004, the GPDU was operated in compliance with its permit. At the end of the calendar year, the operation of the GPDU was indefinitely suspended and the project is being mothballed.

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 to 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.

Table 5.2.5. 2004 Air Emissions Permits – Morgantown Site							
Permits	Status	Exceedance	NOVs	Sources	Pollutants	Emissions	Criteria
R13-1768 and 061-00064	Renewed for 2004	None	None	Minor emission sources, GPDU	None monitored by requirement	Not monitored by requirement	1440 hours operation per year

During 2004, there were no unplanned releases of air pollutants covered by CERCLA or TRI reporting. 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 B-2 and in B-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 B-1, B-3, B-4, and B-7 revealed fiber concentrations below the EPA and State of West Virginia clearance levels (0.01 fibers/cc). Some 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, with the exceedance caused by high concentrations of non-asbestos fibers.

5.2.6 Surface Water Quality and Protection Activities

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. More directly, the surface water program covers permits and monitoring for both storm water sewers (which are separate from sanitary sewers) on site and 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 every year designated storm water outfalls are sampled and tested for basic pollutants (see Table 5.2.6a.) that might indicate contamination from site applications of fertilizer or leaking sewer lines (see Table 5.2.6b.). 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.

Table 5.2.6a. NPDES Permit Storm Water Monitoring Requirements and Limits			
Outfall	Pollutants of Concern	Limits	Frequency
002	Ammonia Nitrogen	4 mg/l	6 mo
	Nitrite + Nitrate Nitrogen	0.68 mg/l	6 mo
	Fecal Coliform		6 mo
005	Total Suspended Solids	100 mg/l	6 mo
	Ammonia Nitrogen	4 mg/l	6 mo
	Nitrite + Nitrate Nitrogen	0.68 mg/l	6 mo
	Fecal Coliform		6 mo
010	Ammonia Nitrogen	4 mg/l	6 mo
	Fecal Coliform		6 mo

Table 5.2.6b. NETL-Morgantown 2004 NPDES Storm Water Analysis Results							
Constituents Cutoff	Conc.	Outfall 002		Outfall 005		Outfall 010	
		6/11/04	9/28/04	6/11/04	9/28/04	6/11/04	9/28/04
Nitrate + Nitrite Nitrogen (Grab)	0.68 mg/L	0.4 mg/L	0.7 mg/L	0.32 mg/L	0.78 mg/L	NS	NS
Ammonia Nitrogen (Grab)	4 mg/L	ND	ND	ND	ND	ND	ND
Fecal Coliform (Grab)	---	>4,000 col/100 mL	>4,000 col/100 mL	>4,000 col/100 mL	>4,000 col/100 mL	>4,000 col/100 mL	>4,000 col/100 mL
Total Suspended Solids (Grab)	100 mg/L	NS	NS	32 mg/L	9 mg/L	NS	NS

NS = Not Sampled; ND = Not Detected

On the developed portion of the Morgantown site, there are four drainage areas that have rain-water 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.
- Outfall 003 receives drainage from a hillside beside B-17 and drains an area of approximately 43,560 square feet. The permit does not require monitoring of this outfall.
- Outfall 005 drains an area that includes B-19 (warehouse, machine shop), B-33 (hazardous materials temporary storage) and various research facilities. It drains 209,088 square feet.
- Outfall 010 drains parking areas, offices and a large section of undeveloped land. It drains approximately 3,197,304 square feet.

The outfalls at the Morgantown site are monitored according to General Permit Registration #WVG610042 under National Pollutant Discharge Elimination System (NPDES) Permit #WV0111457. Major sources for potential spills of petroleum products and oils are above-ground storage tanks, oil-filled transformers and switches, a hazardous waste accumulation facility (B-33) and 55-gallon drums at several locations (B-5, -19, and -36). Presently there are six above-ground 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 above-ground

storage tanks are located inside the area drained by Outfall 002. There are two additional above-ground 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, which have been tested for PCBs. In addition to the tanks of petroleum products and ethanol, there are three storage tanks associated with the GPDU, a project designed to test technologies for removing sulfur gases from hot coal combustion gases. One 6,000 gallon tank holds sulfuric acid, a 15,000 gallon tank holds a 20 percent solution of sodium hydroxide and another 5,000 gallon tank holds a solution of 50 percent sodium hydroxide. Because these tanks pose a significant hazard if their contents are released, the storage facility is 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 above in this paragraph, there are numerous smaller potential sources that are described in a site inventory list.

During 2004 there were several construction activities on site. The major activity was the continued construction on the new parking garage which had a total disturbed area of less than 1 acre. For all projects, best management practices were employed to reduce erosion and stream siltation. 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. Base 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 ephemeral stream that traverses across 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 onsite storm water sewer systems, a completely separate and dedicated sewer system handles the industrial waste water. A third separate and dedicated sewer system on site handles the domestic sewage. Industrial waste water 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 waste water is that waste water conveyed from laboratory sinks and laboratory facilities where pollutants other than normal domestic sewage might enter the waste water stream. The industrial waste water enters a clarifier located onsite where the waste water is sampled monthly. From the clarifier the industrial waste water enters the onsite domestic sewage sewer lines that empty into the municipal sewers owned and operated by the Morgantown Utility Board. The discharge is regulated under pretreatment permit number MUB 012. Periodic sampling is performed by the site support contractor staff, and the samples are analyzed by a contracted laboratory chosen from a list of laboratories certified by the EPA. Discharge Monitoring Reports (DMRs) detailing monthly sampling and analysis are provided to the Morgantown Utility Board (see Appendix A: [Table 5.2.6c. NETL-Morgantown 2004 Waste Water Effluent Analysis](#)). NETL's monitoring activities help to enforce the requirement that hazardous waste are not permitted in the laboratory

drains or other drains, except in the trace quantities that normally originate from washing laboratory equipment and glassware. Line 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.). 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 waste water system to identify the source.

Protection of surface water and ground water 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.

Above ground 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 (B-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 B-33 is indoors, and the facility is inspected each week. At the Morgantown site, hazardous materials are not conveyed through underground pipes, with the exception of acids and bases conveyed to the GPDU. GPDU pipes are enclosed inside PVC pipes, which slope back to secondary containment pits to prevent soil contamination. All above-ground 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 Morgantown Utility Board (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 waste water system and the sources of waste water on site. When the industrial waste water 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 5.2.6c. 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 waste water from the Morgantown site could contain almost any 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.

5.2.7 Ground Water and Soil Quality and Protection Activities

The third environmental media protection program deals with ground water quality, including the monitoring and cleanup of leaks and spills that enter the soil and ground water. Ground water protection on site is controlled by NETL Procedure 450.1-2, *Ground Water Quality Management*, which is administered by the Federal Ground Water Quality Manager. This is a fundamental program that covers regulatory requirements and best management practices for preventing leaks and spills, for ground water and soil monitoring, for contaminated soil removal, and for closeout actions. The directive is supplemented by more detailed information and instructions that are found in the Ground Water Protection Management Plan, which documents the various potential sources of pollution, potential contaminants that should be monitored, methods of well installation and sampling, monitoring strategy, and QA/QC processes related to having water/soil samples analyzed by a contracted laboratory. 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.

NETL's impacts on ground water have been primarily deicer salt contamination, a problem that is shared with many businesses and road maintenance activities in this region (see Appendix A: [Tables 5.2.7a. through 5.2.7f.](#)).

Primarily, the strategy for ground water protection is one of spill and leak prevention. The Morgantown site has both 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 feedstocks 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.

Ground water monitoring is focused primarily on past spills, leaks, and the effectiveness of the cleanup actions undertaken. The section on CERCLA (section 5.2.2) listed the past events and the current status of these spill sites. Two of these past events provide cause for continued ground water and soil monitoring.



An informal agreement exists between NETL and WVDEP concerning the Pond 005 site located north of B-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 low concentrations of organic semi-volatiles 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. An informal agreement subsequently reached with WVDEP requires ground water monitoring around the parking lot perimeter. NETL continues to comply with this requirement.

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.

Twenty-one active monitoring wells exist at the Morgantown site. These wells monitor two shallow aquifers and one deep aquifer. All are sampled annually for pH, water level, conductivity, and temperature. Five wells associated with the now-closed pond 005 are sampled semiannually for benzene, toluene, ethylbenzene, xylenes, naphthalene, phenolics, cadmium, sulfates, sulfides, and chlorides.

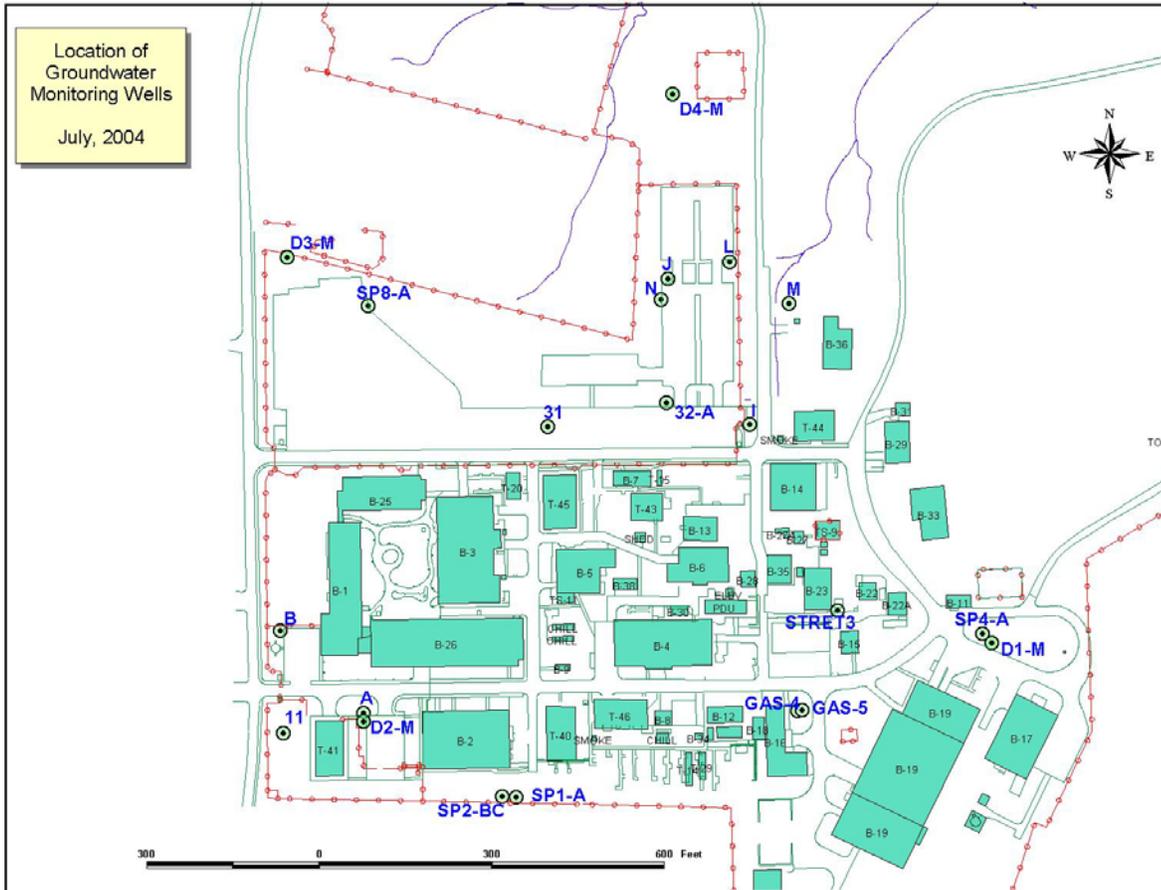


Figure 5.2.7. Location of Ground Water Monitoring Wells at Morgantown Site

The overall ground water 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. Historically (1993 to 2002) ground water monitoring at the Morgantown site 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 5.2.2b.](#)) was formulated to include 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 in the Stretford solution. However, no organic compounds have been 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.

The only contaminants consistently found in significant amounts in the ground water at the Morgantown site are those related to the application of salts for deicing purposes. Sodium chloride (table salt) is applied to the parking lots and roads. 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.

After 10 years of monitoring, ground water conditions are well understood. Spills and leaks in the past have not significantly degraded the ground water 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 ground water contamination. At this point, most of the research is bench-scale and uses small quantities of chemicals and solvents. Accordingly, the ground water analyses have been significantly curtailed. Under the new scheme, wells will be sampled each Spring and late Summer. 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 ground water monitoring during 2004 are presented in Appendix A: [Tables 5.2.7a. through 5.2.7f.](#) A general location map for the samples wells is given in Figure 5.2.7.

5.2.8 Compliance with Other Major Environmental Statutes

5.2.8.1 SARA Title III, EPCRA

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 (or 55 gallons or the specific threshold planning quantity) of a listed extremely hazardous substance.

To help comply with these regulatory requirements, NETL developed Procedure 440.1-2A, *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. Periodically 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 a MSDS number, if a 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 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 shipped off site for disposal, the item is deleted from the list.

The Morgantown site files chemical inventory reports (Tier 2) and MSDS lists (or individual sheets) with 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 reported materials are: nitrogen gas (average daily amount 0 to 99 pounds), alumina (average daily amount 1,000 to 10,000 pounds) and coal (average daily amount 10,000 to 100,000 pounds). Alumina and coal are now stored indoors in small containers and in 55-gallon drums. Nitrogen is stored outdoors in an above-ground storage tank.

The Morgantown site does not generate a toxic release inventory because the site does not release any of the listed toxic materials in quantities that exceed the TRI threshold amounts. During 2004, there were no releases that would trigger emergency notification as required by either EPCRA or CERCLA.

5.2.8.2 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 human environment. The Act establishes three levels of review for federal actions. Under the first and highest level of review, an Environmental Impact Statement (EIS) must be prepared to evaluate the environmental consequences of any major federal action that might have significant impact on the quality of the human 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 Environmental Assessment (EA), is prepared. Based on the analysis in the EA, a decision is made either: that the potential environmental impacts warrant preparation of an EIS; or the impacts are not significant and a Finding of No Significant Impact (FONSI) is issued.

If an EIS or an EA is not required because the federal action does not have a significant effect on the environment, either individually or cumulatively, then the third level of review, a

Categorical Exclusion (CX), is warranted. These federal actions can be excluded from in-depth NEPA review. The classes of actions that DOE has determined do not individually or cumulatively have a significant effect on the human environment and may therefore be covered by the categorical exclusions), as well as the eligibility criteria for their application, are identified in DOE's NEPA implementing procedures (10 CFR 1021).

NETL conducts NEPA reviews for both onsite actions and offsite actions proposed for funding by the federal government. These actions include those planned in cooperation with other governmental organizations, educational institutions, and private industry. NETL performed 444 NEPA reviews in 2004 that resulted in categorical exclusions (203 for Energy Efficiency Renewable Energy activities and 241 for NETL activities). In addition, three new or continuing activities at NETL during 2004 required work towards preparation of Environmental Assessments (EAs). These three EAs will now be discussed.

An EA (DOE/EA-1493) was completed in August 2004, for a project to demonstrate a multi-pollutant control system that can cost effectively reduce NO_x, SO₂, acid gas and mercury from small-to-medium sized coal-fired power plants. The demonstration plant at Greenidge Unit No. 4 in Torrey, New York, would use urea injection for Selective Non-Catalytic Reduction (SNCR) combined with single-bed, in-duct Selective Catalytic Reduction (SCR), low NO_x combustion, and a circulating fluidized bed dry scrubber to achieve emissions reductions. A FONSI for the Greenidge Multi-Pollutant Control Project (under the Power Plant Improvement Initiative) was signed on December 3, 2004.

An EA (DOE/EA-1477) was completed at the end of the first quarter of FY 2004 for a project to analyze the potential environmental impacts from commercial application of a lignite fuel enhancement project at Great River Energy's Coal Creek Station near Underwood, ND. This project was proposed to demonstrate technology for increasing the heating value of lignite and other high-moisture coals by reducing the moisture content using waste heat that would normally be discharged through a cooling tower. A FONSI was issued January 2004.

The final EA (DOE/EA-1498) was completed for cooperative agreement with the University of Kentucky Research Foundation, Center for Applied Energy Research, to design, construct, and operate an advanced coal ash beneficiation processing plant at Kentucky Utilities (KU) Ghent Power Station in Carroll County, Kentucky. The coal ash beneficiation process will be based on hydraulic classification and froth flotation to separate ash particles by size and type to produce a suite of useful products. The demonstration plant would use an existing waste stream of ash to manufacture concrete additives and construction materials. The EA resulted in issuance of a FONSI on December 4, 2004.

Three new or continuing activities at NETL during 2004 resulted in plans for the preparation of Environmental Impact Statements (EIS). These three EISs will now be discussed.

The Gilberton Coal-to-Clean Fuels and Power Project was selected under NETL's Clean Coal Power Initiative and would involve the construction and operation of a plant to produce about 5,000 barrels per day of clean liquid fuels (diesel fuel and naphtha) and about 41 megawatts of electricity from 4,700 tons per day of anthracite coal waste. Evaluation and analysis of comments received at a public scoping meeting led to development of an outline and draft of DOE/EIS-0357. The contractor preparing the EIS, Oak Ridge National Laboratory (ORNL), provided a draft document to NETL for review. NETL's internal comments were provided to the

contractor for incorporation into the draft document. NETL plans to disseminate the draft EIS to the public in 2005.

DOE/EIS-0361 is planned 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. Potomac Hudson Engineering, Inc., was selected during January, 2004, as the contractor to prepare the draft EIS. 2004 efforts have focused on characterizing the existing environment, conducting flood flow impact studies and ground water impact studies, and participating in engineering planning meetings with Western Greenbrier for design of the project and to address environmental planning and mitigation of impacts issues. The meetings have also included examining various alternatives, such as where the plant will be located and how the material fuel and limestone will be transported. Western Greenbrier CoGen, LLC, has sponsored various community meetings to further community discussions about the project. In addition, as part of a data-gathering effort, Western Greenbrier, the County Commission, and DOE/NETL sponsored a high school student program to help obtain data on the affected environment.

During early 2004, Potomac-Hudson Engineering, Inc., began preparing a Programmatic EIS (DOE/EIS-0366) for implementing FE's Carbon Sequestration Program. Public scoping meetings were held in various locations across the U.S. to obtain input regarding the public's concerns. It is anticipated that a draft PEIS would be available by late 2005.

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

- Clean Power from Integrated Coal/Ore Reduction (CPICOR) (DOE/EIS-0280) at Vineyard, UT.
- McIntosh Unit 4 Pressurized Circulating Fluidized-Bed Demonstration Project (DOE/EIS 0282) at Lakeland, FL.
- FutureGen, a project to build an Integrated-Gasification Combined-Cycle power plant combined with deep underground CO₂ sequestration, was on hold during 2004. The industrial consortium, which would implement the project, had not formally organized into a business entity. Additionally, no location had been identified, and no EIS determination had been issued.
- An EIS (DOE/EIS-0362) was proposed for the Next Generation Circulating Fluidized Bed Coal Generating Unit located in Fountain, CO. This project was also



selected from the competitive solicitation for Clean Coal Power Initiative demonstration projects and would involve the construction and operation of an advanced circulating fluidized-bed combustion system using multi-layer emission control to produce 150 megawatts of electricity from the cleanest coal-fired generating unit in the world. However, the project was terminated in 2004; the project withdrew from the CCPI program.

5.2.8.3 Endangered Species Act

Several times during recent years NETL has inquired about the existence of rare, threatened, or endangered species or their critical habitat located within the vicinity of the Morgantown site. Most recently this inquiry was repeated during 2002 when an EA was conducted for the acquisition of five acres of land and the planned construction of several new buildings and facilities. A letter, dated April 5, 2002, from the West Virginia Division of Natural Resources states: “We have no known records of any rare, threatened, or endangered species or wetlands within the project area. The Wildlife Resources Section knows of no surveys that have been conducted in the area for rare species or rare species habitat. Consequently, this response is based on information currently available and should not be considered a comprehensive survey of the area under review.” Staff at NETL has not found evidence to the contrary regarding these species or their critical habitats.

The Morgantown site is located on the northern fringe of the city of Morgantown, at the city limits boundary. In the past, this land was cleared and farmed. The surrounding streams are significantly polluted and degraded from acid mine drainage and from urban/suburban runoff. Now, the surrounding land is experiencing both residential growth and commercial development, and this trend is expected to continue. Therefore, the Morgantown site is mindful of its land holdings and the usage of this property by wildlife. One of the EMPs aims to improve habitat quality of the non-industrial portions of the site. Currently the site hosts populations of common animals (deer, rabbits, skunks, snakes, etc.).

5.2.8.4 National Historic Preservation Act

The National Historic Preservation Act requires that federal agencies consider the potential impacts of their proposed projects on historic properties. It also requires the agencies to undertake appropriate consultation with the State Historic Preservation Officer, local governments and other interested parties. There have been at least two activities within the past 10 years that have triggered historic property investigations. During the 1990s, a portion of the site was investigated where a new facility was to be constructed by the Navy. That investigation covered two previous home sites and produced a Phase I archaeological survey of the areas to be disturbed.

More recently, during 2002, as part of an EA for the purchase of five acres of adjoining land and the proposed construction of several new buildings and facilities, NETL commissioned another Phase I archaeological survey and historic resource survey. The survey addressed an Area of Potential Effect of 10.1 acres on the northwest side of the Morgantown site. The archaeological survey included background research, geomorphological reconnaissance and 37 shovel test pits. It was thought that possibly a Revolutionary War fort or blockhouse (Burrough’s Fort) might have been located in this area. The archaeological survey uncovered no evidence of historic or prehistoric artifacts. It is likely that Burrough’s Fort was located farther south.

The historic survey resulted in completion of West Virginia Historic Property Inventory Forms for two houses adjacent to the DOE site. Neither house was eligible for listing in the National Register of Historic Places both were demolished by NETL to prepare for the future construction of a new childcare facility.

5.2.8.5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 prohibits unauthorized taking, possessing, importing, or other listed actions, with any migratory birds or their eggs. Two EAs have been conducted at the Morgantown site within the past 10 years without any discovery of migratory bird breeding, nesting, feeding or resting sites. During 1993, a survey was conducted of the wildlife resources on site. Again, no concerns associated with migratory birds have been identified at any time, including 2004.

5.2.8.6 Atomic Energy Act of 1954 (42 USC 2011 et seq.)

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 of radiation source materials.

NETL's site in Morgantown does not process, produce or dispose of radiation source materials as a part of its routine operations. However, Morgantown does 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 Officer maintains an inventory of the radiation sources on site, indicating the item, isotope(s), quantity, custodian, location, status and activity. Table 5.2.4a. lists the 2004 source inventory. During 2004, the Morgantown site 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.

Radiation exposure monitoring at the Morgantown site consisted of the use of several personal dosimeter badges supplied under a contract with Radiation Detection Company, Inc. In addition, leak testing and analysis was performed on sealed sources by Applied Health Physics, Inc.

5.2.9 Executive Orders

5.2.9.1 EO 13149, Greening the Government Through Federal Fleet and Transportation Efficiency

Fleet management is provided by the Pittsburgh site. Discussions of fuel efficiency and compliance with this EO are provided in Section 8.2.9.1, as part of the Pittsburgh site descriptions.

5.2.9.2 EO 13148, Greening the Government Through Leadership in Environmental Management

EO 13148 was enacted to ensure federal environmental leadership by requiring executive agencies to do more than is required of private sector organizations. The Order assigns responsibility to federal agency leaders for integrating environmental accountability into agency day-to-

day decision making and long-term planning. Environmental management considerations must be a fundamental and integral component of federal policies, operations, planning, and management. It also requires that pollution prevention should be emphasized as a means to address environmental compliance issues.

The goals of the Order include establishing an EMS, environmental compliance, reduction of toxic chemical releases and use, reduction of ODS use, implementation of environmentally-sound landscaping practices, and reporting under EPCRA and the Pollution Prevention Act of 1990.

NETL implemented an EMS well ahead of the Order's required due date of December 31, 2005. For independent verification of our EMS, NETL received the initial ISO 14001 certification in 2003 from an independent certified auditor. In 2004, NETL confirmed the quality of our EMS twice during surveillance audits again conducted by an independent certified auditor. NETL Order 450.1, Environmental Management System, lays out the process for implementing the NETL EMS including compliance with EMS requirements in EO 13148.

Monitoring and measuring NETL's environmental compliance is accomplished through special audits, program reviews and EMS audits. The EO's emphasis on pollution prevention as a means of environmental compliance is primarily fulfilled at NETL through EMPs. EMPs include performance targets in support of EO 13148. Progress made during 2004 toward accomplishing the Order's goals includes the following:

- Reduce Non-Hazardous Waste. The target for 2004 was to generate not more than 200 metric tons, for a reduction of 69 percent from the baseline 1993 level of 641 metric tons. NETL's 2004 tonnage was 238 metric tons – a 63 percent reduction. NETL will strive to achieve the 75 percent reduction required by 2005, although it is unclear at this time what additional measures may be taken to do so.
- Reduce Hazardous Waste Generation. The target for 2004 was to generate not more than 3.23 metric tons for a reduction of 82.5 percent from the baseline 1993 level of 18.46. NETL narrowly missed this goal by only 0.05 percent – 0.01 metric tons, or an 82.5 percent reduction. The 2005 goal is a 90 percent reduction from 1993 levels.
- Increase Non-Hazardous Waste Recycling. By 2005, NETL should be recycling 45 percent of its non-hazardous waste, and 50 percent by 2010. In 2004, NETL exceeded the short-term (2005) goal by recycling 47 percent of its non-hazardous waste.
- Reduce Hazardous Materials Procured, Received, and Stored. NETL researchers continued disposal of old and expired chemicals in 2004. This contribution, along with conscientious buying and monitoring of the onsite supplies,



allowed NETL to reduce its chemical inventory by 24 percent from the 2002 baseline. The target set is 20 percent by 2005 which is already being exceeded.

- Reduce ODSs. Class 1 Refrigerants and Chiller Replacement. By 2010, EO 13148 requires elimination of all non-exempt Class 1 refrigerants from use. Class 1 ODSs, or chlorofluorocarbons (CFCs), are compounds consisting of chlorine, fluorine, and carbon. When CFCs rise to the stratosphere and are broken down by strong ultraviolet light, they release chlorine atoms that then deplete the ozone layer. CFCs are commonly used as refrigerants, solvents, and foam blowing agents. Substantial progress was made in 2004 in meeting this goal through the purchase and installation of two 167 ton CFC-free chillers to replace two existing 225 ton Class 1 ODS chillers.
- Reduce Generation of Greenhouse Gases. Using emissions from 1990 as a baseline, NETL's target reduction of greenhouse gases, e.g., carbon dioxide, was 23.3 percent for 2004. The actual reduction was 22.7 percent. NETL's carbon dioxide emissions are associated with NETL's consumption of natural gas, electricity, and steam. This reflects substantial progress toward the 2005 goal of 25 percent reduction.
- Decrease Air Emissions of Toxic Compounds. Even though its toxic releases are below the regulatory requirement to report, NETL has taken upon itself to continue to reduce its TRI-listed emissions. The TRI contains information on releases of nearly 650 chemicals and chemical categories from government facilities as well as industries including manufacturing, metal and coal mining, electric utilities, and others. NETL's reduction from the 1997 baseline was 62.2 percent during 2004. This represents a 91% decrease in annual VOC air toxic emissions which exceeds the reduction goal through 2010. Sampling and analysis, including monitoring of facility hours of operation, was conducted at selected point sources to confirm that the air emission inventories were accurate and to act as a tool to identify sources for reduction. Two activities that helped with NETL's reductions for 2004 were (1) discontinuing operation of the PDU at the Morgantown site and (2) discontinuing operation of the 500# combustor at the Pittsburgh site. The discontinued use of these two research units represented a combined 75% decrease in annual VOC air toxic emissions as reported in 2004.
- Conserve and Enhance NETL's Non-Industrial Land Use. NETL contracts with professional horticulturalists to plan and implement its landscaping based on cost-effective and environmentally sound practices. Native plants are used to ensure adaptability. During 2004, a list of four projects was developed for conservation and enhancement of NETL's non-industrial land. Unfortunately, there was not sufficient funding available for these four projects and no further progress was made in 2004. These ideas will be implemented in 2005 and beyond as funds become available.



Reporting under EPCRA and the Pollution Prevention Act is another requirement of EO 13148. These reporting requirements ensure the public disclosure of releases of toxic chemicals into the environment. The law requires facilities which manufacture, process, or use significant amounts of toxic chemicals, to report annually on their releases of these chemicals. The reports show the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on toxic chemicals that are shipped to other facilities for disposal. The EPA maintains this information in its TRI database (<http://www.epa.gov/tri>). NETL's 2004 EPCRA reports are discussed in Section 5.2.8.1.

5.2.9.3 EO 13123, Greening the Government Through Efficient Energy Management

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 has conducted energy audits, completing all facilities by 1999. Several Site Operations Division employees took formal classroom training and passed exams to obtain certification as a Certified Energy Manager.

NETL classifies all of its buildings at the Morgantown site as industrial buildings and laboratories; and, therefore, NETL aims to achieve the EO goals of a 20 percent reduction in energy consumption per square foot in laboratory and industrial (mixed use) facilities by 2005. During the base year (1990), energy use was 369,000 BTU/1000sq.ft. During FY 2004, energy use was 233.3 BTU/1000sq.ft., a reduction of 36.809 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. Part of this has been achieved by the reductions in energy (electricity and natural gas) usage. Additional reductions in emissions have come from the purchase of electricity generated from renewable resources (i.e., wind, solar, geothermal, biomass). In West Virginia and Pennsylvania, the primary new sources of renewable energy are the wind turbines that were recently installed along several ridgelines. No renewable energy was generated on site during 2004.

NETL has made efforts to reduce its consumption of petroleum products (oil, gasoline, diesel fuel, LPG, 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



use petroleum products, which are fueled with gasoline and diesel fuel. An ethanol tank and dispensing system has been installed in Morgantown to support compliance with this EO.

An existing “showcase facility” at the Morgantown site is B-3, which was renovated to become a computer simulation facility. Both the HVAC and the lighting systems were completely replaced with energy efficient systems.

During 2004, NETL’s architectural and engineering firm completed and NETL accepted the Title I and II design of the new Technology Support Facility for the Morgantown site. This building is being built with sustainable design principles and energy efficiency principles so that upon completion the build can qualify for the EPA’s Energy Star certification and for a LEED designation. Conceptual through final implementation design was completed during 2004, with construction scheduled to begin in 2005.

5.2.9.4 EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition

NETL implements through the Pittsburgh site a program for recycling and part of a program for waste prevention. Refer to section 8.2.9.4 within the Pittsburgh discussions for information on waste prevention and recycling. Historically, the affirmative procurement program has been implemented from the Morgantown site. 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 lesser 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 that meet EPA guidelines, except for those products for which written justification is given for avoidance. The EPA must designate items in their Comprehensive Procurement Guideline. Onsite recycling goals for each agency are to be established progressively for year 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.

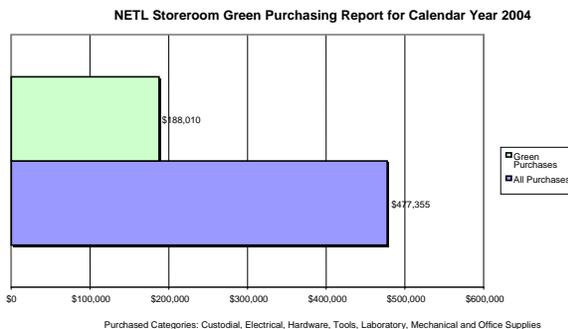
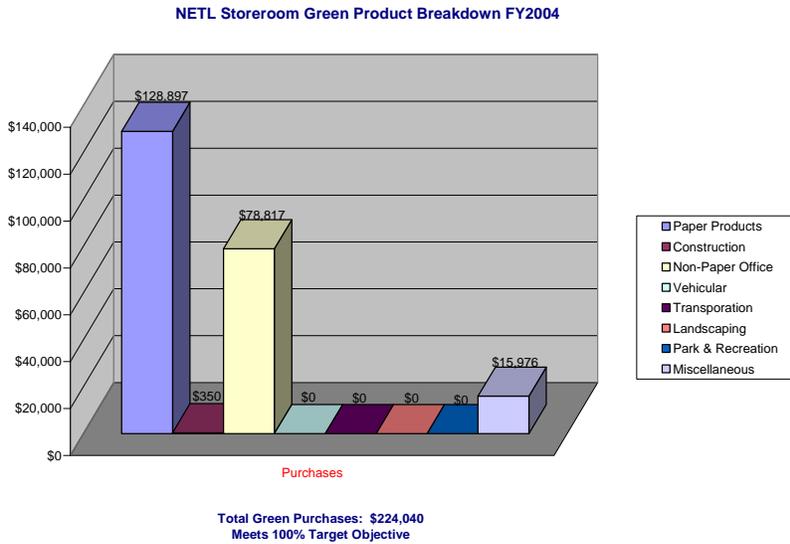


Figure 5.2.9.4a. Affirmative Procurement as a Percentage of Money Spent on Consumer Goods

Government credit card purchases are monitored for compliance, and metrics are tallied each year for purchases by the warehouse and others.

Basically, NETL takes a two prong 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 buys “green”). As a last resort, the prospective buyer can directly purchase the items while under the obligation to make an affirmative choice. Recent enhancements to the SPS 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 5.2.9.2a. 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. The purchase of “green” items is a function of availability and demand, as shown in Figure 5.2.9.2b. During FY 2004, NETL achieved the goal of purchasing 100 percent “green” items for the NETL Storeroom. The Morgantown Storeroom serves both the Pittsburgh and the Morgantown sites.

5.2.9.5 EO 11990, Protection of Wetlands

This EO1 requires that federal agencies undertake actions to minimize the destruction of wetlands. Basically, wetlands should not be disturbed unless there is no practical alternative. Public review is required for activities that would disturb wetlands.

¹ EO 11990, Protection of Wetlands, which was amended by EO 12608, which was revoked in part by EO 13242, which was amended by EO 13261, which was amended by EO 13344, is still applicable to NETL. The amendments are not significant to NETL. EO 11990 can be downloaded from the EPA at: <http://www.epa.gov/owow/wetlands/regs/eo11990.html>

5.2.9.6 EO 11988, Floodplain Management

This EO2 requires justification for a project proposed to be located on a floodplain, a consideration of alternatives to locating the project within the floodplain, and compliance with state and local regulations concerning the use or construction of buildings on floodplains. The Morgantown site does not have buildings or facilities located within floodplains, as delineated on FEMA's Flood Insurance Rate maps. For offsite projects, floodplain impacts and DOE alternatives are addressed during the NEPA process.

5.2.10 DOE Orders

The following is a discussion of key DOE environmental directives that NETL is responsible for implementing. All DOE directives are available for viewing by the public at the DOE Directives Home Page, www.directives.doe.gov.

5.2.10.1 Order 450.1, Environmental Protection Program

NETL implements the requirements of DOE Order 450.1 through its EMS and through NETL's Order 450.1, Environmental Management System. The DOE Order calls for "...sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by Department of Energy (DOE) operations..." and, it requires the implementation of an EMS at each site to secure these goals. NETL complies with these requirements through a comprehensive suite of ES&H directives and programs.

There were 81 findings made during the internal audits that identified non-conformance or opportunity for improvements. Of these findings, 69 have been corrected and only 12 remain open or are pending completion. Many of the findings were educational in nature (e.g., employees not fully understanding EMS processes and their roles within these processes). A complete discussion of the NETL EMS and its 2004 goals and accomplishments is contained in Section 3.

Much progress was made during 2004 as part of the effort to maintain ISO 14001 certification for NETL's EMS. This effort included the continuation of a number of new programs and directives for such things as the identification of significant aspects and targets, development and implementation of EMPs, NETL's EMS, environmental auditing, and control of onsite noise. More specifically, during or by 2004, NETL:

- Developed or reviewed approximately 100 percent of NETL's required ES&H directives for the merged sites.
- Conducted two EMS Management Review Team meetings.
- Conducted three Internal EMS Audits.
- Reviewed and revised as necessary 22 Environmental Management Plans (EMPs) with metrics for each EMP objective.
- Continued to refine the EMS webpage on the NETL Intranet and the ISO 14001 webpage on the external website.
- Maintained the EMS Roadmap (manual).

² EO 11988, Floodplain Management, <http://www.fema.gov/library/EO11988.shtm>, has not had any amendments that affect NETL and is therefore not applicable to NETL.

- Generated periodic regulatory reviews and posted these on the NETL Intranet.
- Underwent two successful ISO 14001 surveillance audits by an ISO 14001 registrar.

Generally, NETL is pleased with the progress made in maintaining its EMS during 2004. NETL emphasized the improvement of programs for the management of environmental risks, including regulatory compliance risks. Roles and responsibilities were sharpened, requirements implemented, and specific improvement activities investigated. As a result, NETL's EMS was re-verified by the ISO 14001 certification process. The certification auditor interviewed key and randomly selected personnel; plus the auditor inspected key documents, at his request. A functioning regulatory compliance program was required by the auditor.

DOE Order 450.1 requires some activities that only apply to sites that have exceptional impacts on the environment. NETL does not handle nuclear materials or large quantities of toxic materials. Nor have there been any visual indications of adverse impacts on wildlife or vegetation that would prompt such special activities. Therefore, NETL does not undertake certain activities listed in DOE Order 450.1, such as the evaluation of the exposure of aquatic and terrestrial biota to toxic or hazardous materials.

5.2.10.2 Order 231.1, Environment, Safety and Health Reporting

Order 231.1 requires each DOE site to produce and submit various reports on such things as lost work days due to injuries, property losses, and environmental impacts. In fact, this ASER is a requirement of Order 231.1. Please see section 8.2.10.2. for a description of Morgantown's and Pittsburgh's compliance with this Order.

5.2.10.3 Order 435.1, Radioactive Waste Management

DOE Order 435.1 requires that radioactive waste are managed to protect workers in accordance with 10 CFR 835 (Occupational Radiation Protection); to comply with applicable federal, state and local laws; and to comply with the guidance in DOE M 435.1-1 (Radioactive Waste Management Manual). Basically, NETL attempts to return sealed radiation sources to the original manufacturer. Only when this is not possible, will NETL send the source item directly to a storage or disposal facility.

A very minor exception to the typical administration of radioactive source material occurred on August 8, 2004 when NETL unknowingly shipped excess government equipment containing a sealed 10 millicurie source to the Idaho National Engineering and Environmental Laboratory (INEEL). The offsite contractor holding the license for this sealed source did not properly transfer the license when closing out the contract. Normally, such equipment would be transferred back to the manufacturer for proper re-use or disposal. In this case however, the contractor subsequently became insolvent and failed to properly transfer the license. The excess property was then transported to INEEL without either INEEL or NETL being informed that the excess property contained a sealed radioactive source. Also, it was not clearly evident from the description of the instrument (e.g. component listings) that it contained a sealed radioactive source. Upon identification of the unidentified source material, NETL contacted the manufacturer of the equipment and ensured that INEEL received the appropriate information for the manufacturer to facilitate a proper transfer of the license for the sealed source material to INEEL.

5.2.11 Other Major Environmental Issues and Actions

NETL has a potential liability for cleanup and for damages resulting from contamination of soil and ground water at the University of Tennessee Space Institute (UTSI), Tullahoma, Tennessee. During the late 1970s, UTSI obtained a contract with NETL to obtain financial support for the continued development and testing of a laboratory-scale coal-fired “magnetohydrodynamic” device. This device simulates a new combustor design for electric power generation, and the project was called the Coal-Fired Flow Facility (CFFF). During the project, there were various incidents when contamination could occur, such as when project personnel cleaned parts on the lawn using various organic solvents and spilled some of the solvents into the soil. There was also a leaking diesel fuel storage tank that contributed petroleum-related contaminants. When the U.S. Geological Survey investigated ground water quality at the site during 1991, they found contamination in the form of a number of chlorinated solvents and petroleum-related compounds. When the Tennessee Department of Environment and Conservation (TDEC) first investigated the situation during 1993, they requested that UTSI begin a ground water monitoring program. This program further revealed the existence and distribution of contaminants. Sampling has continued from 1991 until the present. Civil & Environmental Consultant, Inc. (CEC) conducted the latest sampling tests on November 10, 2004. They have made specific recommendations for actions that could lead to closure of this site. It is their belief that wells MW-17 and MW-18 have penetrated a particular layer of rock (the Chattanooga Shale layer), allowing contamination by naturally occurring gas rather than by manmade pollutants. If this can be proven by carbon 14 dating, the two wells could be closed to future sampling. The remaining three wells (MW-11, MW-13, and MW-14) could be closed by going through the Site Specific Impaired Aquifer classification procedure if it can be shown that the source of contaminants has been removed, the deep aquifer is proven to produce natural gas, and no groundwater users are identified in the vicinity of the property. During 2004, the hired consultants recommended:

Civil & Environment Consultants, Inc. recommends the following phased approach to access the possibilities of either remediation of the groundwater contaminants at the property or attaining a site specific standard for the groundwater contaminants by requesting a Site Specific Impaired Classification for the aquifer.

First, audit the circumstances of the release of the contaminants to ensure that the source has been stopped. If the source has not been removed, do so now. This is a high priority.



Second, review the available data to ensure that the monitoring wells are constructed such that they can provide pertinent and accurate information necessary to assess the groundwater contamination. Upon review of the bore logs and well construction diagrams, it may be necessary to visually inspect monitoring well MW-18 for proper construction. This can be done via a down-hole camera with video taping capability. Both of the deeper monitoring wells are not plumb (both bend and twist with depth)

suggesting that no centralizers were used during their construction. It is possible that the casing for monitoring well MW-18 is breached approximately thirty-one feet below TOC either by dislocation or by incorrect sealing as described earlier in this document. A camera log of this well could provide evidence of improper construction or collapse.

Third, evaluate the source (and age) of the gas observed in monitoring well MW-17. CEC proposes collecting a representative gas sample from near the terminal depth of the monitoring well. Once collected, the gas sample should be radiometrically dated using the carbon isotope ^{14}C . If the source of gas is of manmade origin, the age of the gas shall be recent as opposed to naturally occurring gas which will date significantly older. Another possible dating method would be to use tritium analysis to determine a relative date of the water. However, as the borehole was likely advanced using air-rotary drilling technology with some water injection for dust control, tritium may have been introduced to the subsurface. If the gas dates to greater than two hundred years, the aromatic hydrocarbons found in the groundwater in the deeper wells can be attributed to natural gas and these wells should be abandoned with no further action necessary.

Fourth, during the next groundwater monitoring event, the hydraulic conductivity should be determined for several of the monitoring wells. This can be completed using simple rising head slug tests to estimate the average horizontal hydraulic conductivity within the aquifer. Once the average horizontal hydraulic conductivity has been determined, an estimate of the groundwater flow velocity can be determined. The rising head slug tests can be completed using either field determined head observations if sufficiently timely (recovery within a few hours) or by using data logging pressure transducers if the recovery rates are slower. Judging by the conditions observed during the November 2004 monitoring event, it is likely that data logging pressure transducers would be necessary to determine the rising head of groundwater elevations.

By following this approach, CEC believes that we can acquire the information necessary to determine the best approach for the future of the property in relation to the environment. If the source of contaminants has been removed, the deep aquifer is proven to produce natural gas, and no groundwater users are identified in the vicinity of the property, it may be most advantageous to pursue a Site Specific Impaired Aquifer classification. The information necessary to request this classification is also the information necessary to determine the best remediation approach, if one is deemed appropriate for this circumstance.

[Ground Water Monitoring Report, University of Tennessee Space Institute, November 2004. Conclusions and Recommendations]

6.0 ENVIRONMENTAL RADIOLOGICAL PROGRAM INFORMATION

Because the Morgantown site is not a nuclear facility, it does not have a radiological program of comparable size and complexity as those programs found at the 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. See section 5.2.4, Radiation Protection Activities. Additional information may be found in section 5.2.8.6

(Atomic Energy Act of 1954), and section 5.2.10.3 (DOE Order 435.1, Radioactive Waste Management).

Non-applicable radiological program requirements for NETL in 2004 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

PITTSBURGH, PENNSYLVANIA

7.0 MAJOR ACTIVITIES IN 2004

Following is a brief discussion of the major activities that occurred at the Pittsburgh site and their impact.

7.1 Building 83 Upgrade

A major upgrade was performed on the building 83 laboratories. This included demolition of unusable laboratory space and replacement of the depleted roof. A new CFC-free HVAC system was installed. Outdated laboratories located on the third floor were decommissioned and moved to modern laboratory facilities in either building 92 or building 84. A comprehensive engineering survey of the building 83 electrical and mechanical systems was performed prior to the decommissioning to ensure safe and proper procedures were followed. Design work was completed for the upgrade of chaseways and restrooms. The laboratory compressed air supply system was upgraded with a new compressor. This ensured completion of the first phase of a multiphase complete renovation of the building 83 laboratory facility.

7.2 Building 90 Improvements

Building 90 is a single purpose facility used to house three air compressors needed for supply air for the research plateau. The entire Building 90 was renovated to support operations during adverse winter weather. This included the installation of three new, multistage, energy efficient, air compressors which provide exhaust heat used in the building to prevent freezing during the winter. Thermostatic controllers were installed to ensure proper temperature in the building during periods of temperature fluctuation.

7.3 Building 65 Safety Upgrades

Improvements were made to the building 65 cylinder pad and to the concrete pad and pantry drainage system. A new concrete driveway with a new curb and sidewalk was installed. The roof was repaired to prevent damage of hazardous material compressed gas cylinders during adverse weather conditions.

7.4 Third phase of the Building 58 3rd Floor Office Renovation Completed

Laboratory office space constructed more than fifty years ago was renovated to incorporate modern electrical, mechanical, and safety features not available when the building was originally constructed. This included replacement of old single pane windows with new energy efficient double pane windows, upgrade to a hot water demand system from the inefficient heated hot water tank system, modern telecommunication equipment and lines, computer system infrastructure upgrade, and Americans With Disabilities compliant access and restroom facilities.

7.5 Building 74 Detailed Design for New Boilers Completed

New boilers were designed for the wastewater treatment facility (building 74), building 86, and Building 92 laboratory. The new boilers were designed to more efficiently heat these facilities. Completed initial design of the new process controls used to control wastewater discharge from the Building 74 industrial wastewater treatment facility. This included upgrade to the system controls and monitoring equipment. A new computerized operations system was installed for automated treatment of wastewater effluent.

7.6 Americans with Disabilities Act (ADA) Compliance

Improvements were made to facilities in Building 167 emergency operations center and physical fitness facility, to building 58, and to offices located in the procurement/human resources building 921. The improvements were made to ensure compliance with the ADA and included ramps to doorways, automatic door openers, wheelchair accessible facilities and restrooms, mated floor surfaces, special office equipment and office areas for persons with disabilities, and emergency egress equipment for persons with disabilities.

7.7 Building 84 Laboratory Upgrade Performed

Due to the renovation being provided to the building 83 third floor laboratories, an upgrade of room 120 of building 84 was made to accommodate relocation of the building 83 laboratory. The building 84 laboratory was upgraded to provide modern laboratory facilities including fire suppression sprinklers, fire alarms, laboratory fume hoods, and laboratory furniture. The upgrade also included removal of asbestos-containing laboratory furniture and asbestos-containing floor tiles.

7.8 Building 94 Penthouse Construction

The building 94 laboratory was modified with new boilers and HVAC condensers and a computerized heating/cooling system installed to ensure efficient heating and cooling in the laboratory areas. Two chlorofluorocarbon (CFC) containing HVAC chillers were decommissioned, removed and the CFC recycled. A penthouse was constructed on top of the building to house the new boilers and chillers used to control the temperature inside the building. Complete replacement of the building electrical, gas, plumbing, and air conditioning chiller water system was performed. This created a self-contained HVAC system that is significantly more efficient and environmentally compatible.



8.0 ENVIRONMENTAL COMPLIANCE

8.1 Compliance Assessment Process

The Pittsburgh site uses the same processes as the Morgantown site to perform environmental compliance assessments. This includes SARS reviews, program reviews, regulatory agency inspections, management walkthroughs, external audits, and in-house audits. These processes are discussed in detail in Sections 3.8 and 3.9 of this report.

In addition to NETL's internal efforts toward quality assurance, regulatory agency inspections are conducted at the discretion of the agency and may include only selected subsets of the regulatory jurisdiction of the agency. These inspections are usually announced in advance or are periodic, so they are rarely a complete surprise. Inspectors from regulatory agencies know the applicable regulations under their jurisdiction thoroughly, so their inspections are the most valuable from a compliance assurance viewpoint.

There were two industrial waste water inspections performed in 2004. On April 26, 2004, Pleasant Hills Authority (PHA) performed an inspection. A Notice of Violation (NOV) was received on May 24, 2004, for a free cyanide exceedance of the Building 74 effluent from this inspection. The NETL split sample produced no detectable presence of free cyanide. On September 1, 2004, PHA and the EPA conducted an inspection, no violations were issued. ACHD's Division of Air Quality conducts an inspection annually of the air emissions facilities at the Pittsburgh site. The 2004 inspection found no violations.

8.2 Compliance Status

8.2.1 Summary of Permits

A summary of environmental permits for the Pittsburgh site is provided in Table 8.2.1.

Table 8.2.1. Summary of Permits – Pittsburgh Site			
Permit No. Expiration Date	Permit Type	Regulatory Agency	Description
7032056-000-00500 A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit	Air	ACHD	4,500,000 BTU/Hr. Cleaver Brooks Natural Gas Boiler located in B-922.
7032056-000-00501 A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit.	Air	ACHD	Three 1,630,000 BTU/Hr. RayPak Finned Coppertube boilers located in B-922
7023056- A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit.000-00800	Air	ACHD	500 lb/hr. gas and coal-fired research combustion unit in B-86.
GF 31062.008 12/28/2002. Waiting for PHA to issue a new permit.	Industrial Sewer Use	PHA	Establishes the permissible waste water effluent discharge of certain process/laboratory/ waste-water constituents.
PA0025844 07/11/2001. A renewal application was submitted on 01/11/2001 but a new permit has not yet been issued.	Storm water Discharge	PADEP	National Pollutant Discharge Elimination System (NPDES) permit for the discharge of site storm water into the public waterways of Pennsylvania.
PA0297201 Not applicable	Industrial Settling Weir	PADEP	Permit for an industrial settling weir owned by the U.S. National Institute of Occupational Safety and Health
02-81183008A 10/04/2005.	Aboveground Storage Tank Registration	PADEP	Permit for tank containing ferric chloride.
02-81183009A 10/04/2005.	Aboveground Storage Tank Registration	PADEP	Permit for tank containing caustic soda.
PAA-040112	Asbestos	ACHD	Asbestos Abatement Permit for B-58.

Table 8.2.1. Summary of Permits – Pittsburgh Site

Permit No. Expiration Date	Permit Type	Regulatory Agency	Description
PAA-040106	Asbestos	ACHD	Asbestos Abatement Permit for B-94.
PAA-040339	Asbestos	ACHD	Asbestos Abatement Permit for B-83.

8.2.2 Environmental Restoration Activities

CERCLA/SARA Onsite Cleanups. 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 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. 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 2004 or at any other time during the past.

The Pittsburgh site is listed as “Undetermined” on the EPA CERCLA Section 120 List. This is because NETL detected onsite soil and ground water 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. Ground water 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”].

During the period from November 1992 to April 1994, the Pittsburgh site performed a broad and comprehensive site sampling and analysis investigation. This investigation included soil, surface water, stream sediment, and ground water throughout each of the areas that are occupied or potentially impacted by DOE operations. One hundred forty-four surface samples and near surface samples were taken from nine study areas at the site. Generally, very low solvent and petroleum contamination was found to be ubiquitous at the site (including background).

Table 8.2.2a. provides a summary of the findings from the investigation and the actions taken to remediate the problems.

Table 8.2.2a. NETL Site Sampling and Analysis Investigation and Cleanup Actions

Source	Contaminant	Remediation
Former above-ground storage tank in 900 area	Petroleum	The contamination was cleaned up through excavation and disposal of 493 tons of soil at the Arnoni landfill.
Former fueling boom in 900 area	Petroleum	The contamination was cleaned up through excavation and disposal of 802 tons of soil at the Arnoni landfill.
Former oily water sump in lower 900 area (former Synthane Plant)	Petroleum	The contamination was cleaned up through excavation and disposal of 237 tons of soil at the Arnoni landfill. In addition, 5,750 gallons of oily water were removed from the sump and treated/disposed at the Liquimax Facility.
Former gas holders on main plateau	Lead	The contamination was cleaned up through excavation, treatment, and disposal of 110 tons of hazardous material at the Mill Service Yukon facility and the excavation and disposal of an additional 311 tons of non-hazardous soil at the Arnoni landfill.
Soil piles on the former waste staging area at the 2.2 acre site	Solvent	Prior to scheduled removal, some of the material was accidentally graded flat. Resampling identified only a portion of the graded material as contaminated. Ultimately, 804 tons of soil were disposed at the Arnoni landfill. PADEP reviewed the incident, and decided that since the solvent concentrations were so low, the ground water management plan should be sufficient to detect impacts to ground water and no immediate further action was required.
Soil piles east of B-83	Solvent and mercury	The contamination was cleaned up through excavation and disposal of 6 tons of soil at the Arnoni landfill.
Stained soil near B-910	PCB	The contamination was cleaned up through excavation and disposal of one-half ton of soil at the Arnoni landfill.
Courtyard B-59	Solvent and Petroleum	The contamination was cleaned up through excavation and disposal of previously excavated soil at the Kelly Run landfill.
Main plateau and valley fill area	Trichloroethylene (TCE) and Nickel in ground water	Ground water monitoring wells were installed to monitor the contamination. Level of TCE contamination is very low but still above federal drinking water levels. Level appears to be decreasing over time and no migration is evident. Presence of Nickel is believed to be caused by winter salting of roadways causing a breakdown of the well casing and not contamination of groundwater from independent sources. No remediation is appropriate or required.
Contaminated soil outside B-90	TPHs	Removal of 160 tons of contaminated soil.
Contaminated soil west of B-93	TPHs	Removal of 112 tons of contaminated soil from the site of former above-ground storage tanks.
Contaminated soil near B-902	TPHs	Removal of 30 tons of contaminated soil at site of former under-ground storage tank.
Contaminated soil near B-922	TPHs	Site capped by installing a compacted clay cover.

RCRA Cleanups. The NETL Pittsburgh site has never had a RCRA corrective action and, when last checked, was not on the Corrective Action Report (CORRACTS). For purposes of RCRA regulation, the Pittsburgh site is a large quantity generator, which is defined as an entity that generates in any month more than 1000 kilograms of non-acutely hazardous waste or more than 1 kilogram per month of acutely hazardous waste. Therefore, Pittsburgh is found on the RCRIS-

LQG (Resource Conservation and Recovery Information System for Large Quantity Generators) database.

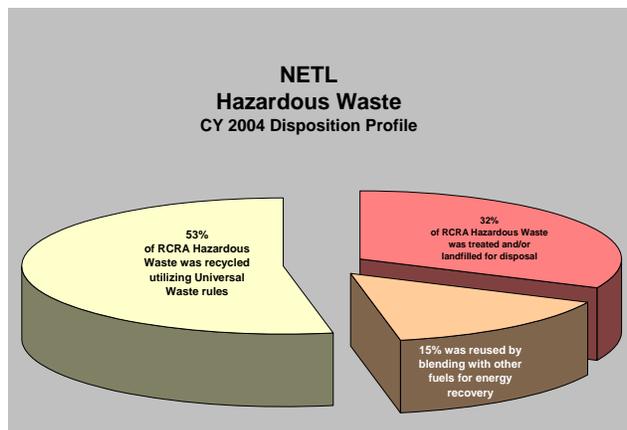
During 2004, there were no RCRA-regulated spills or releases, no remediation actions, and no special surveillance actions. Ground water monitoring is conducted routinely and provides base-level surveillance for the entire site.

Federal Facilities Compliance Act Actions. The Federal Facilities Compliance Act waived sovereign immunity for the federal government executive agencies regarding the payment of fines and civil penalties for violations of RCRA. It gave EPA explicit authority to issue compliance orders to federal agencies for violations of RCRA. However, it also permitted executive agencies to avoid RCRA's land storage ban on mixed radioactive waste. There were no occasions during 2004 when EPA's Federal Facilities Division contacted NETL about possible compliance actions. The EPA did not levy any civil fines on NETL during 2004. NETL does comply with federal, state, and local laws regarding the handling of hazardous waste and is subject to civil fines for violations of those requirements.

TSCA Actions. There were no documented spills or releases of TSCA regulated substances (e.g., pesticides, PCBs, formaldehyde, and methylene chloride) occurring during 2004. The site does have some residual asbestos from earlier construction methods. There has been an ongoing program of asbestos removal or encapsulation during recent years in an effort to eliminate or secure all asbestos-containing materials. During 2004, there were four asbestos abatement actions at the Pittsburgh site. The first abatement permit was obtained for third floor rooms in Building 58. The second permit was for the transite wall on the third floor of Building 58. The third permit was for removal of an asbestos-containing roof flashing on Building 94. The fourth permit was obtained for abatement of the roof on Building 83. All asbestos abatement work is performed by an asbestos remediation contractor who utilizes trained and certified technicians. NETL requires that asbestos abatement firms provide copies of certificates to the Federal Asbestos Program Manager. The contractors arrange for the disposal of asbestos and also provide NETL with a manifest after they have shipped the waste to a disposal facility. NETL office workers are not exposed to asbestos hazards during their routine work. The abatement work is performed to minimize the risk to NETL maintenance workers who would perform maintenance work at these locations.

8.2.3 Waste Management and Pollution Prevention Activities

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 2004. 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 450.1-9), *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 attend every three years the hazardous waste operations training and 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 2004 was transported to the storage and treatment facilities of American Environmental Services (AES), Inc. using AES to transport the waste. The AES facility combines small packages of similar waste and repackages the waste for more cost-effective shipment to a final disposal facility, selected by AES and monitored by NETL. Non-hazardous waste (normal office waste not being recycled and cafeteria waste) are transported to a local landfill utilizing commercial waste disposal services.

The hazardous materials handling and waste generation operations were improved during 2004. NETL generated 6,075 pounds hazardous waste during 2004, 0.28 tons less than the target established for 2004. Please see section 3.4 on Environmental Objectives and Targets for an explanation of how this target 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 when possible for requested hazardous chemicals. Smoke detectors and 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 also completed during 2004. 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 into the facility 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 is scheduled to start during 2004.

Liquid waste are kept in drums. NETL Pittsburgh 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 2004. 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 waste 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 are transferred to the waste management organization. The waste generators ensure that all hazardous or potentially hazardous waste are properly contained and identified at the point of generation. Generators are held accountable for waste that are not properly contained or identified or are otherwise mismanaged.

Waste handling personnel who collect the hazardous waste first inspect the container, the labels, and the internal manifest to ensure that the waste 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 proper handling techniques and disposal methods for chemical waste.

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. Table 8.2.3b. lists the TSCA-regulated chemicals used at NETL Pittsburgh in quantities greater than 10 pounds.

Table 8.2.3b. TSCA Chemicals Held at NETL-Pittsburgh In Quantities Greater than 10 Pounds		
Common Name	CAS	Quantity (lbs.)
Naphthalene, 1,2,3,4-tetrahydro-	000119-64-2	41
Carbon Tetrachloride	000056-23-5	13
Boric Acid	010043-35-3	38
Nitric Acid	007697-37-2	169
Hydrochloric Acid	007647-01-0	1,712
N-Hexane	000110-54-3	55
Sodium Acetate	000127-09-3	10
Carbon Dioxide	000124-38-9	3,852
Ethyl Acetate	000141-78-6	18
Ferric Chloride	007705-08-0	3,286
Methanol	000067-56-1	154

During 2004, some asbestos remained on site encased within building materials such as floor tile, floor tile mastic, roofing tar paper, laboratory countertops, laboratory hoods, muffle furnaces, and drying ovens. 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 cannot be assured was manufactured after July 2, 1979 and is therefore presumed to contain PCB at a concentration greater than 50 ppm. NETL disposed of 56 pounds of such suspect waste in 2004 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.

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 during previous years. Most is contained within floor tile and floor tile mastic found on the floors of several lab buildings (B-74, 58, 83, 86, 94, 95, 141, 903, and 920). The remainder is contained in the roofs and within laboratory furniture (B-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 device refractories, 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 B-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 2004, 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.

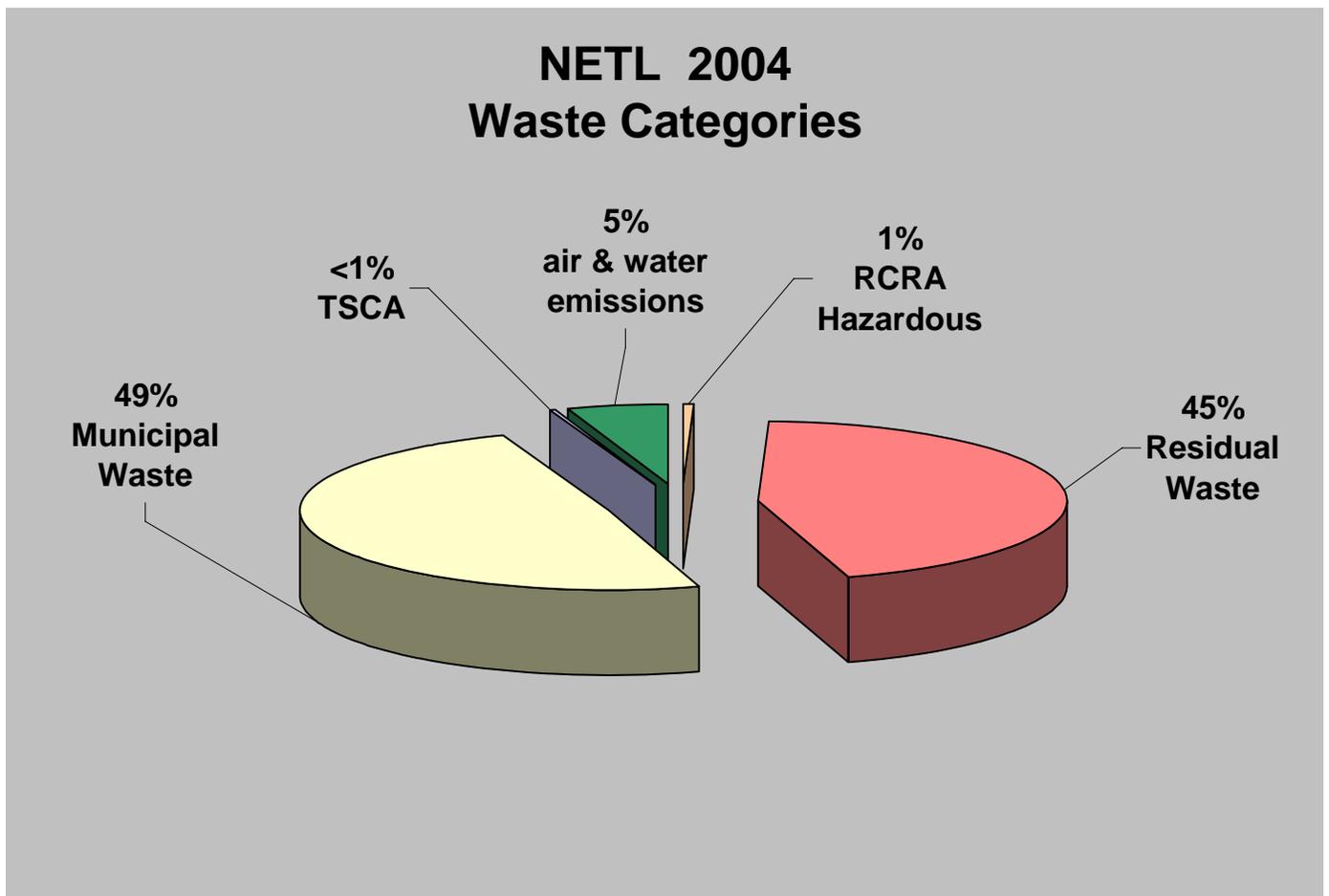
The Pollution Prevention (P2) program is implemented in accordance with NETL Procedure P 450.1-10, *Waste Minimization, Pollution Prevention, and Recycling Program*. “It is the NETL policy that waste generation shall be prevented or reduced at the source, whenever feasible. Waste whose generation cannot be avoided shall be recycled in an environmentally safe, compliant manner, whenever feasible. Disposal or releases of waste into the environment shall occur only as a last resort...” The Waste Minimization Coordinator oversees the source reduction efforts and the recycling programs. The idea is to create a culture of waste minimization and pollution prevention by training the employees and facilitating the processes. Computer-based training is provided; and messages about recycling, affirmative procurement, and source reduction are posted on the Intranet. Key requirements of the Waste Minimization and Pollution Prevention Plan include the establishment of goals for reducing the volumes of various waste streams, tracking and reporting of material usage and waste generation for comparison with the goals, employee awareness training, and specific pollution prevention opportunity assessments (PPOAs). See [Table 8.2.3.c](#) for a complete description of the areas addressed by the PPOA.

Key requirements of the Recycling Plan are the implementation of collection programs for recyclable materials, the sale or donation of recyclable materials, and employee awareness training. NETL’s principle recycling programs are: (1) aluminum cans, (2) corrugated paper, (3) mixed office paper waste, (4) leaf waste, (5) scrap metal, (6) used magazines, and (7) used newsprint. Contractor employees pick up these materials at designated accumulation areas and transport them to the recyclables management area or the designated area (for decomposition of leaf waste). Arrangements are then made for the sale, donation, or onsite use of these materials. Scrap metals (steel, copper, aluminum) are accumulated in designated dumpsters. Magazines, newsprint, telephone books, and wooden pallets are also recycled on an opportunistic basis (which occurs most of the time).

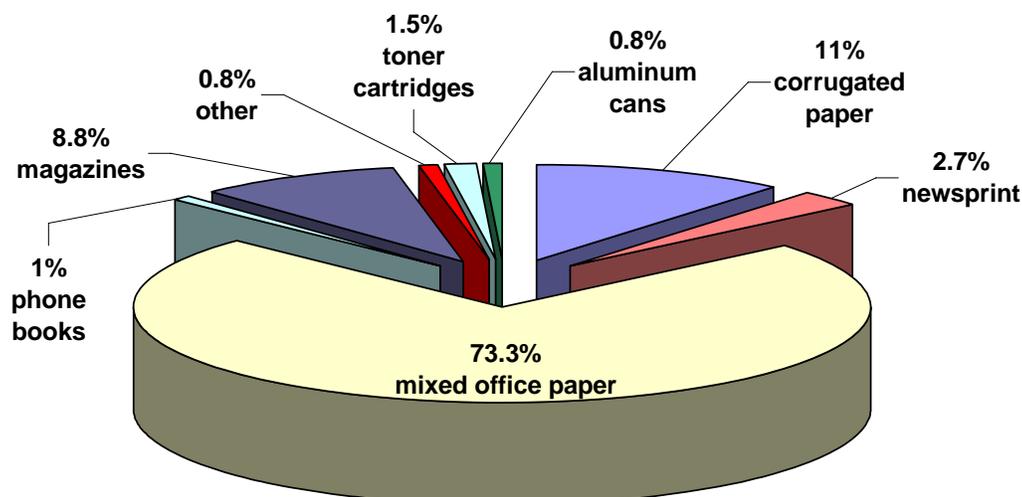
A few examples of new pollution prevention or recycling initiatives are presented below. Other examples are provided throughout the text of this document.

- NETL began purchasing low-volatile paints, instead of high-volatile oil-based paints.
- NETL increased contracting with offsite paint shops where paint volatiles are either captured or burned. NETL does not have a paint booth where volatiles could be captured.

- NETL exhaustively investigated the potential for reducing the quantity of oily rags sent to disposal. Given the rag laundering program currently in place and the rag reuse practices for automotive maintenance (rag reuse until no longer useable), no further reduction is feasible.
- Reduction of waste water treatment sludge. The Pittsburgh site is investigating low-cost options for drying the sludge to decrease its weight and for reducing the quantity of sludge generated by lowering the amount of ferric chloride used as an “agglomerate” for precipitating metals.
- Pittsburgh is seeking opportunities for disposing of coal combustion ash and for reuse of treated waste water effluent as process/cooling water.



NETL Recycled Municipal 2004 Distribution Profile



Many of the principle pollution prevention activities are addressed by the EMPs, as outlined in Table 3.4.

8.2.4 Radioactive Materials

Use of radioactive materials at NETL is limited to research instrumentation that contains sealed radioactive sources (see Table 8.2.4a.) and radiation generating devices (see Table 8.2.4b.). 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, and Commonwealth of Pennsylvania recommendations and requirements.

Table 8.2.4a lists the radioactive sealed sources in use at Pittsburgh during 2004. NETL did not release any radionuclides into the environment. 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 used radioactive source materials, and the other five are in instruments that produce only X-rays (see Table 8.2.4b). These instruments are two scanning electron microscopes, an electron spectroscopy chemical analyzer, an X-ray diffractometer, and an X-ray mailroom scanner.

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 2004.

Table 8.2.4a. 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 8.2.4b. 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

8.2.5 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 B-922. The second permit (7032056-000-00501) is for three RayPak Finned Copper Tube Boilers, located inside B-922, each having a 1,630,000 Btu/hr input rating. The third permit (7023056-000-00800) is for the 500 lbs/hr gas and coal-fired research unit located inside B-86.

The site was designated as an “administratively synthetic minor source” by the ACHD, and this designation continued through 2004. 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 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, quantity, and total time of fuel burned to determine the estimated emission level. The results of this modeling are summarized in Table 8.2.5. The 500 lb 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 Bldg 58, 84, 900, 920, 921, and 922; three Kewanee Boilers in Bldg. 84; unpaved roads (particulates); and paved roads. The Combustion and Environmental Research Facility (CERF) was not operated during 2004 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 research combustion unit and for the boiler air emissions permits. There were no NOVs and no unplanned air emissions during 2004.

Table 8.2.5. 2004 Air Emissions Annual Report						
Pollutant	Estimated Emissions (Tons/Year)					
	500 lb Combustion Unit	MCCF	Combined Boilers	Unpaved Roads	Paved Roads	Total Site
Carbon Monoxide	0.074405	0.00588	0.102606	0.01	0.113	0.305891
Lead	2.05 e-5	0	0	0	0	2.05 e-5
Nitrogen Dioxide	1.1342	0.007	0.12845	0.0007	0.0007	1.26475
Particular Matter <10 micron	0.01284	1.33 e-4	0.002311	0.11138	0.26931	0.395974
Particular Matter Total	0.00210	1.33 e-4	0.002311	0.50273	1.72601	2.233284
Sulfur Dioxide	6.49740	4.20 e-5	0.000733	0	0	6.498175
VOCs	0.00571	3.85 e-4	0.006703	0.0007	0.008	0.021498

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 usage of Class I ODS is being phased out for the HVAC equipment. For example, water fountains that contained Class I ODS in their chiller units were replaced across the site during 2004. Systems and appliances with environmentally friendly substitutes are being used to replace the Class I ODS 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.

8.2.6 Surface Water Quality and Protection Activities

The topography of the NETL Pittsburgh site is comprised of rolling hills which 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 north area houses all of the laboratory and process facilities for the DOE portion of the site. The south 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 waste water, or sanitary waste water 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, ground water, and soil. Applicable federal, state, and local regulations potentially affecting these activities are reviewed, and compliance is ensured before approval by the ES&H staff.

Laboratory waste water from the north area is routed to the WWTF located in B-74. All treated industrial waste water, which consists of laboratory and process waste water 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 waste water prior to discharge into the sanitary sewer. The effluent can be re-circulated from a point just beyond the

plate separator (prior to the filtration system) if additional pretreatment is required prior to filtration and discharge. Final effluent pH adjustment occurs just prior to discharge into the effluent monitoring tank. Treated industrial waste water effluent from the site's WWTF is then routed to, and given final treatment in, the Pleasant Hills publicly owned 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 of effluent constituents (free cyanide, phenolics, mercury, copper, chloroform, and pH) that may be discharged in the waste water. The permit requires NETL to submit to PHA's consulting engineering firm, Gannett Fleming, Inc., waste water analysis data semiannually for the treated waste water effluent discharged through the WWTF, which is located in B-74. 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 waste water survey report that contains no analytical data but rather summarizes information about the site's industrial waste water discharge, including the volume of waste water discharged, the number of site employees, the type of waste discharged, and the type of pretreatment performed.

NETL received two NOV's for violations of the Industrial Sewer Use Permit during 2004. On May 24, 2004 an NOV was received for an April 26, 2004 PHA semi annual inspection grab sample for a free cyanide concentration of 0.032 mg/l (permit limit is < 0.010 mg/l) from the Building 74 effluent. The NETL split sample was non-detectable for free cyanide. On August 10, 2004 an NOV was received for a July 7, 2004 NETL monthly composite sample for a free cyanide concentration of 0.016 mg/l (permit limit is < 0.005 mg/l) from the Building 74 effluent. [Table 8.2.6a](#) (Appendix A), provides the Industrial Waste Water Treatment Facility Effluent sampling results taken at the B-74 WWTF during 2004, including the monthly free cyanide exceedance (the exceedance is indicated by shading).

The south area does not have and does not need an industrial waste water 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 north area is combined with sanitary sewage from CDC/NIOSH. This sanitary sewage discharge is separate from the discharge of the treated laboratory/process waste water. Sampling of the sanitary sewage occurs at the sub-interceptor location, which is adjacent to the site's main entrance road approximately 200 feet inside the main entrance gate, at the point where sanitary waste water from the CDC/NIOSH area is combined with sanitary waste water from NETL. Analytes for this waste stream are the same ones required for the industrial waste water permit. Sampling of the effluent entering this shared sub-interceptor revealed that the NETL-generated sanitary sewage contribution was not a source of discharge contamination. Subsequently, NETL was removed from the sub-interceptor stream sampling requirement beginning in 2001. However, NETL continues to perform sampling of this waste water stream at the request of the PHA. No NOV's were issued for the sub-interceptor discharge monitoring analysis.

In addition to the sampling and analysis performed by NETL and CDC/NIOSH, PHA conducts independent sampling and analysis of waste water effluent from all these locations. This infor-

mation is used by the PHA to determine whether any discharges of the treated effluent were in excess of the local limits and required issuance of a NOV.

MSHA has a separate sanitary sewer line from the NETL and NIOSH sub-interceptor discharge on the north side of the site. The MSHA sanitary sewer line discharges directly into the South Park main sanitary line. The sanitary sewer discharge from the NETL/NIOSH sub-interceptor 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 south area is routed to, and treated in, the separate Clairton publicly-owned municipal sewage treatment plant.

Storm water (surface water) runoff from the 69-acre NETL north side portion of the site exits the site through the north 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 and consist of air conditioning condensate, runoff from various impervious surfaces into the site storm sewers, and treated acid-mine drainage from a safety 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 April 23, 2004 that released turbid water into Lick Run.

Storm water collected from the south side of the site exits through the south 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 north side of the site is regulated through a NPDES permit issued to NETL, NIOSH and MSHA. Storm water discharged from the south side of the

site is regulated through a NPDES permit issued to only NETL. [Table 8.2.6c](#) 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. [Table 8.2.6c](#) also provides the storm water South Outfall monitoring results for flow, suspended solids, aluminum, iron, manganese, lead, pH, and ammonia.

8.2.7 Ground Water and Soil Quality and Protection Activities

The Ground Water Monitoring Program has as its primary objective the monitoring of the shallow, weathered bedrock zone as the first significant aquifer or water-bearing unit beneath NETL facilities. Contamination entering the ground from surface sources would be expected to impact this zone first; hence, the majority of monitoring wells are placed in this zone. The Program also

requires monitoring wells in the deeper water-bearing zone to provide data on water quality at greater depths and deeper contaminant migration (if any).

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

The Ground Water Monitoring Program provides the following information:

- Baseline conditions of ground water quality and quantity related to the site.
- Characterization of the ground water and surface water relationship.
- Identification of potential sources of ground water contamination.
- Data useful in the development and implementation of remedial measures for any NETL facilities/sites that could pose a concern to the environment.
- Measurement of petroleum hydrocarbons (diesel range organics) in ground water at selected wells surrounding abandoned (or previously removed) storage tanks and oil spill areas at the Pittsburgh site, per state request.



The scope of the Ground Water Monitoring Program continued to be reduced during 2004 because without regulatory demand or the suspicion of some past contamination, the previous level of sampling and analyses is no longer justified. The monitoring system will now focus on indicators that can provide early detection of potential concerns. Specifically, the total number of monitoring wells was reduced from 23 to 8 (actually, only 7 wells were actually sampled because the 8th well was unavailable due to construction of that well). The number of

laboratory-analyzed constituents in these eight wells was reduced from 64 to 1, namely, Total Petroleum Hydrocarbons (TPH). Selection of the eight wells that will continue to be monitored is based on a storage tank closure plan that was submitted to the State during 1994. The selected eight wells are close to the site of two removed underground storage tanks that are the subjects of the closure plan. The single constituent that is now monitored at these wells, TPH, will indicate ground water contamination from these removed tanks should such contamination ever appear. TPH measurements by EPA method 8015B (TPH-DRO) is normally the best test to perform for # 2 fuel oil (# 2 fuel oil has the same composition as diesel fuel) according to the U.S. EPA. No TPH were detected in any of the ground water samples taken during 2004. The results of the Ground Water Monitoring Program are provided in the Table 8.2.7.

Table 8.2.7. Ground Water Detection Monitoring Program Results of Analysis								
Well	Sample Date							
	05/05/04				10/06/04			
Constituents	pH	Specific Conductance	Temperature	TPH-DRO	pH	Specific Conductance	Temperature	TPH-DRO
VFW-2	6.97	2790	12.4	ND	6.77	2140	14.5	ND
VFW-4	6.91	3910	15.3	ND	6.80	2040	15.5	ND
VFW-7	6.95	5630	12.4	ND	6.60	6300	15.8	ND
VFW-10	7.16	2980	12.5	ND	6.72	1610	15.5	ND
VFW-11	7.30	2960	12.1	ND	6.48	1640	14.6	ND
VFW-12	7.20	2980	11.0	ND	6.60	1760	14.6	ND
VFW-14	7.04	3950	12.5	ND	6.72	2190	14.4	ND

pH unit: standard unit; Specific conductance unit: umhos/cm @ 25 0C; Temperature unit: degree centigrade; TPH-DRO: Total Petroleum Hydrocarbons – Diesel Range Organics; ND: Non Detect

8.2.8 Compliance with Other Major Environmental Statutes

8.2.8.1 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 lbs. 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 lbs. Table 8.2.8.1 lists those chemicals reported by NETL for 2004, commonly known as the Tier II Chemical Inventory Reporting List.

Table 8.2.8.1. Tier II Chemical Inventory Reporting List			
Chemical Name	CAS	Average and Maximum Daily Amount (lbs)	TPQ (lbs)
Nitrogen (liquid and gaseous)	7727-37-9	100,000-999,999	10,000
Nitric oxide	10102-43-9	100-999	100
Sulfur dioxide	7446-09-5	100-999	500
Hydrochloric acid	7647-01-0	1,000-9,999	500

The NETL Pittsburgh site does not prepare a 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 2004, there were no releases that would trigger emergency notification as required by either EPCRA or CERCLA.

Section 312 of SARA Title III requires NETL to provide an MSDS to the Pennsylvania Emergency Response Commission, the Local Emergency Planning Commission, and the local 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 campus.

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.

8.2.8.2 National Environmental Policy Act

The NEPA program and the preparation of NEPA documents are administered by the NETL NEPA Compliance Officer. During 2004 there were no newly proposed site improvements projects or R&D projects at the Pittsburgh site requiring the development of an EA or an EIS. A joint description of NEPA activities for both the Morgantown and Pittsburgh sites is provided in section 5.2.8.2.

8.2.8.3 Endangered Species Act

There are no endangered species within the zone of potential effect or the Pittsburgh site. The U.S. Fish and Wildlife Service and the Pennsylvania Fish and Boat Commission were consulted to confirm that there is no indication of rare, threatened, or endangered species within the vicinity of the site. During 1981, there was a terrestrial and aquatic ecologic survey, which also failed to identify any endangered species on the site.

8.2.8.4 National Historic Preservation Act

NETL has evaluated all potential landmarks at the site and determined that there are no historically significant landmarks owned by



DOE that require preservation. The historically significant landmarks on the site are all owned and maintained by the National Institute of Occupational Safety and Health which shares the site with DOE. NETL undertakes appropriate section 106 reviews, as part of its NEPA process, prior to undertaking any actions that could impact historically significant landmarks.

8.2.8.5 Migratory Bird Treaty Act

The NETL site has only minimal areas that could be used as habitat for migratory bird populations. No migratory birds were observed at the site, and NETL did not take any action that had, or was likely to have had, a measurable negative effect on migratory bird populations. No migratory birds of any species were intentionally taken during the conduct of any program, activity, or action, including but not limited to banding, marking, scientific collection, taxidermy, or depredation control.

8.2.8.6 Atomic Energy Act of 1954 (42 USC 2011 et seq.)

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 radiation protection orders, EPA regulations applying to radiation control, and Nuclear Regulatory Commission regulations are all based on the AEA. DOE complies with these requirements by implementing radiation protection programs at all facilities that process, produce, handle, use or dispose of radiation source materials.

The Pittsburgh site does not process, produce or dispose of radiation source materials as a part of its routine operations. Please see section 8.2.4 for a more complete description of Pittsburgh's radiation protection program.

8.2.9 Executive Orders

8.2.9.1 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 actions taken in 2004 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 26,610 gallons petroleum fuel through the vehicle fleet in 2004. These values compare favorably to the 1999 values when NETL consumed 29,602 gallons total fuel (10% reduction in petroleum fuel consumption).
- Increase 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. 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 10,454 gallons of alternative fuel as compared to 26,610 gallons petroleum fuel in 2004.

- Acquire conventional vehicles with higher fuel efficiencies by increasing average EPA fuel economy ratings of passenger cars and light trucks by at least 3 mpg by the end of FY 2005, compared to FY 1999 acquisitions:
 - The NETL vehicle fleet consumed 26,610 gallons petroleum fuel in FY 2004 and traveled a total of 648,504 miles during that time. The resulting average fuel economy for FY 2004 is 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 during that time 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 E.O. 13149



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8.2.9.2 EO 13148, Greening the Government Through Leadership in Environmental Management

Compliance with the EO is described in the Morgantown site discussions in section 5.2.9.2.

8.2.9.3 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 aggressive in providing the most energy efficient management of facilities possible. For example, lighting retrofits are now a routine part of the re-lamping program. T-8 fluorescent bulbs are used to replace T-12 fluorescent bulbs and compact fluorescent spotlights are used to replace incandescent spotlights. Motion sensors have been installed to conserve energy in areas without constant use.

The current 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 use of off-grid generated electricity; and (7) plan for and ensure the efficient and economical acquisition, management, and use of energy and utilities.

NETL has incorporated energy efficient designs and energy star equipment into construction packages, remodeling, and maintenance projects. The NETL Pittsburgh childcare facility is pursuing LEED certification for existing building construction during 2004. NETL has a Comprehensive Energy Management Plan (NETL Operating Plan 430.2-1), which includes the requirements of an energy curtailment plan (for use in the event of emergencies) plus the requirements of EO 13123.

The Comprehensive Energy Management Plan establishes the strategy and annual implementation steps for compliance. As a part of the decision-making about whether to undertake certain projects and investments, NETL undertakes lifecycle costs 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 lifespan of equipment or facilities. To further guide the decisions about priorities for energy efficiency improvements to the infrastructure, NETL has conducted energy audits. Several employees have attended formal classroom training and passed exams to obtain certification as a Certified Energy Manager.

NETL's co-funded Building 94 Energy Management Retrofit Project that is co-funded with the Federal Energy Management Program 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 and 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 167ton chillers; and replacement of existing fluorescent fixtures with high efficiency 3 tube T-8 fluorescent fixtures.

When completed, the 51,823 square foot B-94 will provide an annual energy and cost savings of 8,200 Mbtu and \$80,000 respectively. The design/construction schedule for this project will encompass FY 2002 through 2007. FY 2004 activities include completion of the expanded roof penthouse, installation of variable speed drive supply air fans, installation of the 2 new 167ton cfc free chillers, installation of the high efficiency natural gas fired multi-stage boilers (replacing a landlord-supplied coal-fired steam heating system), installation of the new air handlers and continued expansion of the building management system. Future out-year work will include removal of the Class I CFC R-11 refrigerant from the existing chillers and shipping them to a DOD reclaiming facility. Decommissioning and removal of the existing chillers, continued upgrade of building management system, continued retrofit of laboratory hoods with purchase and installation of laboratory hood controls, installation of building



management room controls and purchase and installation of high-efficiency 3 tube T-8 fluorescent fixtures.

Building 58 renovations of the NETL Pittsburgh Site are continuing during FY 2004. B-58 (34,357 square feet) was redesigned from a research facility to an Office of Science and Technology administrative support facility. This redesign and subsequent construction involved the installation of energy efficient electronic ballasts and T-8 lamp lighting fixtures; installing perimeter wall insulation; installing natural gas-fired energy efficient hot water boilers (replacing a landlord-supplied coal-fired steam heating system); installing an energy-efficient variable speed drive rooftop mounted HVAC system; installing lighting occupancy sensors in appropriate spaces; replacing existing window glazing with energy-efficient window glazing; and installing electro-optic sensor controlled faucets, urinals, and commodes in newly constructed restrooms.

NETL during FY 2004 successfully re-competed its Natural Gas Utility Contract identifying to the selected contractor criteria to supply land fill gas to the site when possible. Out year efforts will include supplying NETL's Pittsburgh Site with land fill gas at a volume and price agreed upon by the contractor and NETL that benefits NETL.

During fiscal year 2004 NETL Pittsburgh in effort to reduce energy consumption through various upgrades initiated a survey to determine 100# compressed air 24/7 requirements of its research activities. The survey results indicated an average air flow of 40-64 acfm with occasional larger flows of 110-115 acfm. The existing 75hp compressor unit supplied a constant volume of ~ 350acfm. This large constant volume was way above load requirements. Therefore NETL initiated an engineering design and construction package in FY 2004 to install a compressed air system that would meet the variable load requirements with optional capability to meet higher constant loads. After much research the resulted design package included two compressors connected in a lead/lag series. The design and installed compressed air system included a 13.5hp-51hp variable speed drive unit and a constant volume 40hp unit. The system configuration uses the variable drive compressor as the lead to follow the average load requirement and once the load increases to 70% of the variable unit capacity the system starts the constant volume compressor. At this stage the constant volume compressor now becomes the lead compressor and the variable drive unit becomes the lag or trim compressor. When the acfm load

reduces to a lower volume the compressor operator secures the constant volume unit and the variable drive unit again becomes the lead.



One compressor when operating develops approximately 126,600 btu/hr of rejected heat. Since the compressor building is not a normal working space but more of a utility area the space only needs minimum heat in and around 50 degrees F. The design and final installation of the compressor incorporating using this waste heat to heat the building. The installed system included waste heat ductwork with interior and

exterior dampers to provide rejected heat use in the building during the cooler months and

rejected heat removal to outside air during the warmer months. The waste heat recovery allows NETL to remove the landlord supplied steam heat from the building which demonstrates an energy saving of 1.09X10⁹ BTU/heating season.

The energy dollar savings associated with both the new compressed air system and the waste heat recovery save the NETL Pittsburgh site approximately \$22,000 annually. Future out year work will involve installing a building management system in the compressor building to automatically operate the waste heat recovery dampers eliminating manual operation.

NETL aims to achieve the EO goals of a 20 percent reduction in energy consumption per unit area by 2005 and a 25 percent reduction by 2010, relative to 1990 levels. During the base year (1990), energy use at the Pittsburgh site was 457,846 BTU/GSF, and energy use during FY 2003 was 303,040 BTU/GSF. Energy use during FY 2004 was 250,680 BTU/GSF, a reduction of 45.27 percent from energy use during 1990.



NETL has also attempted to reduce the greenhouse gas emissions that could be attributed to the energy use at its facilities. The EO goal is a 30 percent reduction in greenhouse gas emissions compared to 1990 levels. Part of this has been achieved by the reductions in energy (electricity and natural gas) usage. Additional reductions in emissions have come from the purchase of electricity generated from renewable resources (i.e., wind, captured methane, water, and biomass). During FY 2004, NETL purchased 427 megawatt-hours of electricity from renewable resources. In Pennsylvania, the primary new sources of renewable energy are the wind turbines that were recently installed along several ridgelines (Photo: Atlantic Renewable Energy Company). No renewable energy was generated on-site during 2004.

NETL has made efforts to reduce its consumption of petroleum products (oil, gasoline, diesel fuel, LPG, 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 use petroleum products, which are gasoline and diesel fuel.

8.2.9.4 EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition

NETL implements through the Pittsburgh site a program for recycling and part of a program for waste prevention. Refer to section 8.2.9.4 within the Pittsburgh discussions for information on waste prevention and recycling. Historically, the affirmative procurement program has been implemented from the Morgantown site. 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 lesser 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 that meet EPA guidelines, except for those products for which written justification is given for avoidance. The EPA must designate items in their Comprehensive Procurement Guideline. Onsite recycling goals for each agency are to be established progressively for year 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.

Basically, NETL takes a two prong 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 buys “green”). As a last resort, the prospective buyer can directly purchase the items while under the obligation to make an affirmative choice. Recent enhancements to the SPS 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 5.2.9.2a. 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. The purchase of “green” items is a function of availability and demand, as shown in Figure 5.2.9.2b. During FY 2004, NETL purchased 100 percent of the “green” items that could be purchased affordably by the warehouse. This is an improvement over 2003, when the affirmative procurement rate was nearly 100 percent. The Morgantown warehouse serves both the Pittsburgh and the Morgantown sites.

8.2.9.5 EO 11990, Protection of Wetlands

There were no site activities that might have impacted wetlands during 2004. Wetland investigations were conducted during April of 2002 as part of the NEPA process prior to construction of the childcare facility. The investigation identified one wetland covering 0.002 acres and delineated the wetland utilizing the U.S. Army Corps of Engineers Wetlands Delineation Manual (Technical Report Y-087-1). The wetland was classified as “palustrine emergent” in accordance with the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979). Using the WET 2.0 predictive model, the wetland received a high rating in the “ground water discharge” category. In other words, most people

would call this wetland a “seep.” Potential impacts to wetlands resulting from proposed offsite projects are covered by EO 11990 and are addressed during the NEPA process.

8.2.9.6 Floodplain Management

There were no site activities during 2004 of concern for floodplain management. Floodplains are always considered during the review of a new construction project. The reviews are conducted by reviewing existing information depicted on the U.S. Geologic Survey (USGS) 7.5 minute Glassport quadrangle and the applicable National Flood Insurance Program, Flood Insurance Rate Map (FIRM). A floodplain assessment was last performed in 2003 and revealed no floodplains within the site.

8.2.10 DOE Orders

Following is a discussion of DOE environmental directives that NETL is responsible for implementing. All DOE directives are available for viewing by the public at the DOE Directives Home Page, www.directives.doe.gov.

8.2.10.1 Order 450.1, Environmental Protection Program

DOE Order 450.1 requires the implementation of an EMS at each site. It also requires various environmental programs and evaluations. NETL’s compliance with this Order is discussed in section 5.2.10.1. The same programs are established at both the Pittsburgh site and the Morgantown site.

8.2.10.2 Order 231.1, Environment, Safety, and Health Reporting

A major responsibility of every field office is reporting information on ES&H issues. NETL is accountable to DOE Headquarters and regulatory agencies to provide timely data reporting on activities that could adversely affect the health and safety of the public, workers, or the environment, as well as data reporting that is required by law.

Included in the requirements established by Order 231.1 is a requirement to follow DOE Manual 231.1-2, Occurrence Reporting and Processing of Operations Information. There were eight incidents that occurred in 2004 that required notification through the Occurrence Reporting and Processing System (ORPS). Four of the seven incidents were reported on the basis of being a near-miss, meaning that the incident was reported on the basis of what could have happened, rather than on what actually occurred. Near miss reporting is considered an important step in preventing more serious consequences by examining the cause of the narrowly avoided incident and taking preventative measures to prevent an actual occurrence. The four near-miss reports submitted included: Exposure to Blood Bourne Pathogens; Applying Misidentified Disinfectant; When Air Brakes Fail to Hold Cat 950 Parked on an Incline; and Fire Protection Foam into Stormwater Discharge System.

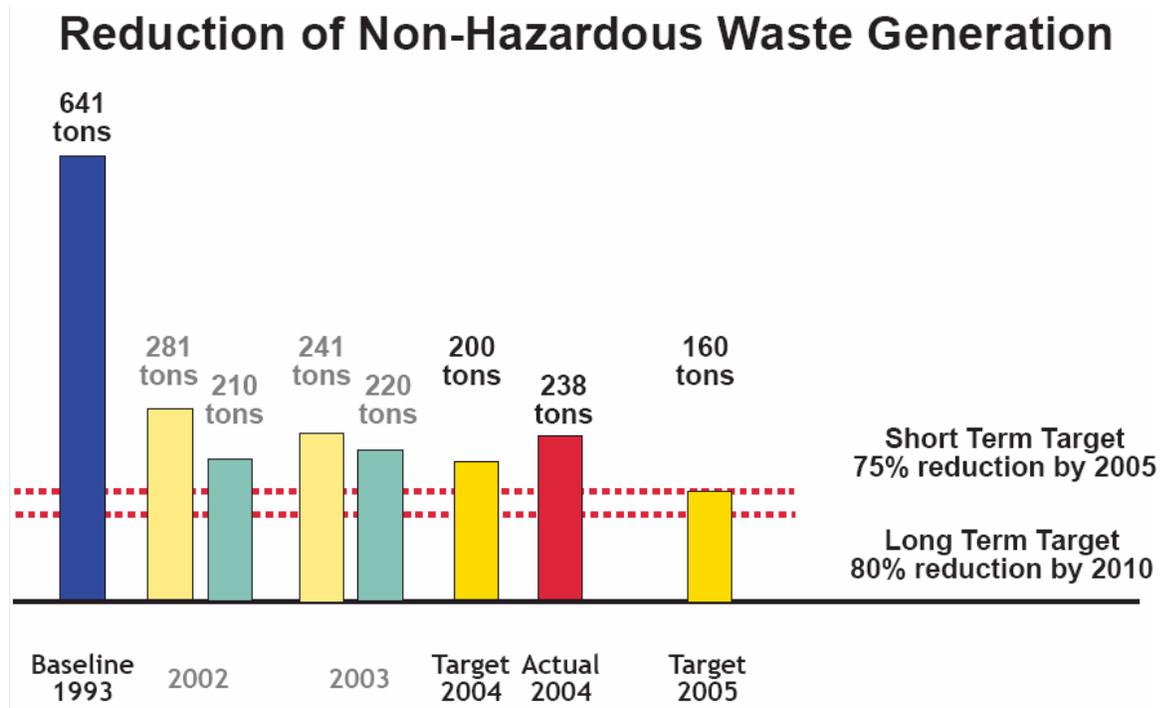
Four other incidents met the ORPS reporting criteria as required by the DOE Order 231.1. Two of these incidents were for NOV’s received at the Pittsburgh Industrial Wastewater Treatment Facility and are discussed in section 8.2.6 Surface Water Quality and Protection Activities. Another incident involved the improper transport of a sealed source and is discussed in section 5.2.10.3 Order 435.1, Radioactive Waste Management. The remaining incident involved an unexpected rupture of an underground water supply line used to provide water used by the site

fire suppression system in Pittsburgh. The rupture resulted from unexplained deterioration of the metal pipe, causing potable water to flow up from the rupture and out onto the surrounding soil surface. The escaping water then flowed into a nearby storm water catch basin where it then flowed into nearby Lick Run. Because the water had picked up sufficient soil during this incident to become “turbid,” the Commonwealth of Pennsylvania required NETL to make written notification to the Bureau of Water Standards and Facility Regulation. The incident was swiftly terminated by turning off the water supply using valves that control water flow to the system.

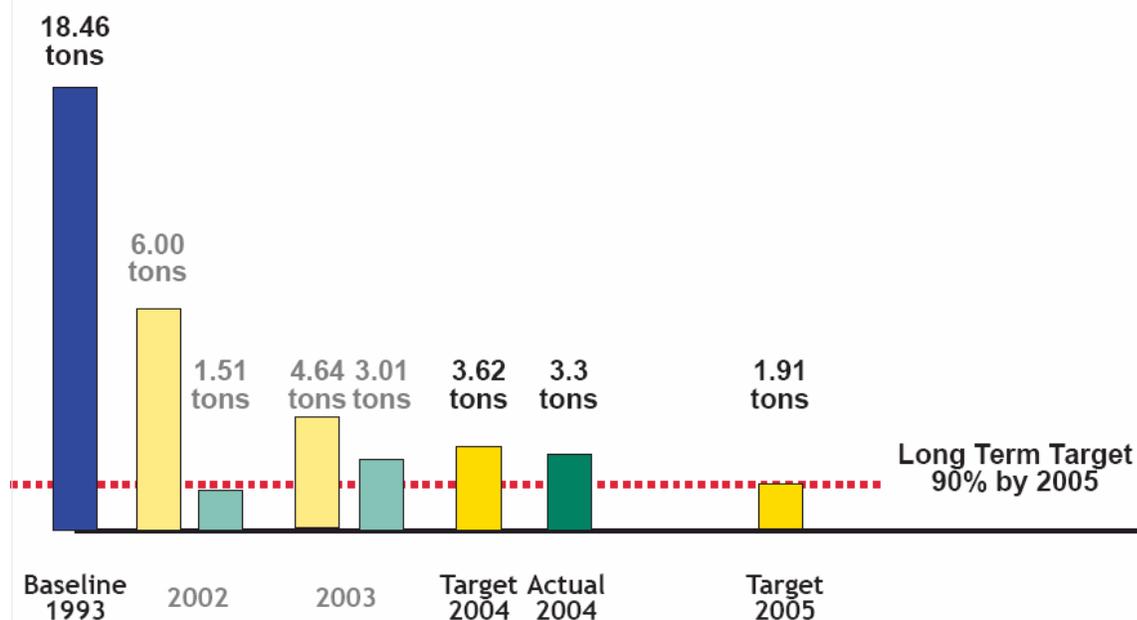
DOE Order 231.1A, Environment, Safety, and Health Reporting, sets forth DOE reporting requirements for all field offices and laboratories. The accompanying manual, DOE M231.1-1A, provides details on each requirement, such as reporting method, data elements to be reported, and due dates. The manual divides the reporting requirements into three chapters: (I) Reporting Environmental Protection Information; (II) Reporting Occupational Safety and Health Information; and (III) Reporting Ionizing Radiation Exposure Information. Table 8.2.10.2. summarizes NETL’s reporting requirements derived from DOE Order 231.1A. A discussion of how NETL reports under each chapter of the reporting manual follows.

Table 8.2.10.2. NETL Reporting Requirements for DOE M 231.1-1A Environment, Safety, and Health Reporting Manual				
Requirement	Responsible Person	Periodicity	Recipient	Date
ASER	Director, ES&H; Environmental Manager; ES&H Division; SSC ES&H staff	Annually	General Public; HQ/ES&H; HQ/FE (ESH); Senior Management; Internet; Intranet; ES&H Records Retention	10/2004
Annual NEPA Compliance Summary	NETL Director; NEPA Compliance Officer	Annually	General Public; DOE Assistant Secretary, ES&H; HQ/FE (ESH); ES&H Records	1/31/2004
NEPA Report	NEPA Compliance Officer	Annually (or as needed)	DOE Office of NEPA Policy and Compliance; HQ/FE (ESH); ES&H Records	N/A
Work-Related Fatalities, Injuries, and Illnesses Report	Director, ES&H; CAIRS Manager	Quarterly	DOE Assistant Secretary, ES&H; HQ/FE (ESH); Intranet; ES&H Records	10th of month following end of qtr
Work-Hours Information	Director, ES&H; CAIRS Manager; Property Manager	Quarterly	DOE CAIRS Data Coordinator; Intranet; ES&H Records	10th of month following end of qtr
Annual (Calendar Year) Summary of Fire Damage Report	Director, ES&H; Fire Protection Program Manager	Annually	DOE Fire Protection Authority Having Jurisdiction (AHJ); HQ/FE (ESH); ES&H Records	04/30/2004
Epidemiologic Analyses – Excess Injuries and Illnesses	Director, ES&H; Occupational Medicine Program Manager	Every 5 years (or as needed)	DOE Assistant Secretary for ES&H; ES&H Records	N/A
Occurrence Reports	Director, ES&H; ORPS Facility Manager, ORPS Facility Representative	As needed.	DOE EH ORPS Database	N/A

Chapter I. Reporting Environmental Protection Information. There are three major reporting requirements under Chapter I. The first, environmental protection program reporting ensures that the information needed to meet the requirements of DOE Order 450.1, Environmental Protection Program, is reported annually. NETL accomplishes this through various reporting mechanisms including the Annual Air Emissions Inventory, Meteorological Data Reports, NETL Air Toxics Sampling and Analysis Plan, the Ozone Depleting Substances Inventory, and the ASER. These reports contain information which is used to evaluate the effectiveness of NETL's EMS as well as NETL's progress on meeting Order 450.1 requirements (see Section 5.2.10.1.). More specifically, these reports provide details about NETL's environmental programs, progress towards goals, and monitoring and measurement data. In addition, NETL provides input to the DOE Annual Report of Waste Generation and Pollution Prevention Progress, which is produced by DOE-EH. The information provided to DOE-EH includes information on NETL's progress in reducing waste generation, use of Class I ODS, and procurement of recycled-content materials.



Reduction of Hazardous Waste Generation



As the above charts demonstrate, NETL has been very successful in meeting its hazardous and non-hazardous waste reduction goals. The target for 2004 was to generate not more than 3.62 metric tons of hazardous waste for a reduction of 80 percent from the baseline 1993 level of 18.46. NETL surpassed this goal by over 2 percent, producing only 3.03 metric tons for an 82.1 percent reduction. The 2005 goal is a 90 percent reduction from 1993 levels. The target to reduce non-hazardous waste for 2004 was to generate not more than 200 metric tons, for a reduction of 69 percent from the baseline 1993 level of 641 metric tons. NETL's 2004 tonnage was 238 metric tons – a 63 percent reduction. Despite suffering a minor increase in non-hazardous waste generation from the amount generated in 2003, NETL is optimistic that it will achieve the 75 percent reduction required by 2005.

A key reporting requirement of Chapter I is the ASER. NETL's ASER is prepared annually and contains summary environmental data (such as that shown in the figures shown above) that allow the public and DOE Headquarters to understand NETL's significant environmental programs and the work being done to reach its environmental goals. ASER data include effluent releases, environmental monitoring, environmental occurrences and responses reported during the calendar year, compliance with environmental standards and requirements, and environmental performance measures.

The last requirement in Chapter I is NEPA reporting. NEPA reporting includes an Annual NEPA Compliance Summary that is submitted to DOE-EH and made available to the public through the NETL website by January 31 of each year. The summary includes both completed and planned milestones for EAs and EISs that NETL is responsible for executing. It shows NETL's progress and effectiveness in implementing the NEPA program. A complete discussion of the 2004 NEPA activities can be found in Section 8.2.8.2. An annual NEPA report provides the status on mitigation action plans for projects. There were no mitigation actions to report during 2004.

Chapter II. Reporting Occupational Safety and Health Information. This Chapter addresses reporting requirements for (1) accident and injury information, (2) fire protection, and (3) epidemiological analysis. Accident and injury information is reported through the Computerized Accident/Incident Reporting System (CAIRS) managed by DOE-EH. NETL provides updates to CAIRS information quarterly. Other reports for occupational safety and health information are: Monthly OSHA Report to Senior Management; Workday Case Rate and Occupational Safety and Health Cost Index Report; Quarterly Performance Report for NETL; and the Quarterly and Annual NETL Functional Activity Comparisons with Industrial Standard Rates and DOE (FE) Cost Index. Additional occupational safety and health information that is reported includes:



- OSHA Form 300A, Annual Reporting of Work-Related Fatalities, Injuries, and Illnesses.
- DOE F 5484.3, Individual Accident/Incident Report. Reporting of all DOE employee recordable work-related injuries and illnesses.
- DOE F 5484.4, Tabulation of Work Hours. Reporting of total employee hours worked.

NETL ensures that accident reports and related records for DOE and DOE contractors are kept, maintained, and accessible as required by Order 231.1A. Public access to these records is limited according to the exemptions of the Freedom of Information Act (FOIA), and the reports are restricted to information that does not constitute an unwarranted invasion of personal privacy.

Fire protection is an important program that ensures the safety of workers, property, and the public. Each year, NETL submits to DOE-FE an annual report, NETL Annual Fire Protection Summary, of the previous year's fire damage. The report is submitted prior to April 30 of each year. The report for 2004 was submitted during April 2005 and reported no fire damage for 2004.

Lastly, NETL must notify the Assistant Secretary of Environment, Safety, and Health of suspected illnesses or injuries that may require epidemiologic investigation. If there were an unusually high number of illnesses or injuries occurring among a group of workers, an epidemiologic analysis could help determine whether the illnesses were associated with working conditions. As part of the investigation, NETL would provide to officials of the Centers for Disease Control and Prevention (CDC) and support contractors access to NETL's facilities, workers and data as needed. During 2004, NETL did not record an unusually high number of illnesses or injuries and, therefore, did not request an investigation.

Chapter III. Reporting Ionizing Radiation Exposure Information. Chapter III addresses radiation exposure reporting to the Radiation Exposure Monitoring System (REMS) repository. There are two types of required reports: (1) annual individual radiation exposure records and (2) radiation exposure records for special individuals. The first report includes all DOE and DOE contractor employees who are exposed to radiation at their workplace. The second report covers individuals who are conducting official DOE-related business at a DOE or DOE contractor site that

causes them to be exposed to a radiation source. NETL did not have any radiation exposures during 2004.

The final requirement of M231.1-1A is the Contractor Requirements Document (CRD), which applies to contractor-operated sites. NETL is a government owned and operated site so the CRD requirements do not directly apply.

8.2.10.3 Order 435.1, Radioactive Waste Management

DOE Order 435.1 requires that radioactive waste are managed to protect workers in accordance with 10 CFR 835 (Occupational Radiation Protection); to comply with applicable federal, state, and local laws; and to comply with the guidance in DOE M435.1-1 (Radioactive Waste Management Manual). Basically, NETL attempts to return sealed radiation sources to the original manufacturer. Only when this is not possible, will NETL send the source item directly to a storage or disposal facility.

This Order would apply when NETL disposes of radiogenic sources. However, during 2004 no sources were sent to disposal facilities, so this Order's requirements were not applicable during the year. Please see section 8.2.4 for discussions on NETL Pittsburgh's radiation protection activities.

8.2.11 Other Major Environmental Issues and Actions

The US Environmental Protection Agency notified NETL on March 29, 2004, that it was a Potentially Responsible Party (PRP) under Section 107(a) of CERCLA. The notice alleged disposal of waste containing hazardous substances at the Breslube-Penn Superfund site located in Coraopolis, Pennsylvania. Due to the relatively small amount of waste disposed by NETL at this site, the notice offered an opportunity to enter into a First Round de minimis settlement of the cleanup liability at the site. Upon NETL's acceptance of the de minimis settlement, EPA arranged for a Consent Decree to be executed with NETL providing for liquidation of all PRP liability at this site. In executing the Consent Decree, DOE/NETL did not admit any liability arising out of the transfer of waste material to this former waste oil recycling site. In exchange for settlement of this alleged liability, NETL received a covenant not to sue or take administrative action from the EPA, and contribution protection from lawsuit by other PRPs.

9.0 ENVIRONMENTAL RADIOLOGICAL PROGRAM INFORMATION

Because the Pittsburgh site is not a nuclear facility, it does not have a radiological program of comparable size and complexity to those programs found at the nuclear facilities. NETL performed both area radiological monitoring and individual radiological dosimeter monitoring during 2004 in those areas where sealed radiation sources are located. No radiological contamination has been detected anywhere at NETL during 2004, or any other year. 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 a program for protection of the public and the environment from radiation hazards because all sources are contained in small, sealed instrumentation and would preferably be returned to the instrument manufacturer when not wanted at NETL. For these reasons the radiological program at the Pittsburgh site has been described within our regular ES&H (non-radiological) program information. See section 8.2.4, Radiation Protection Activities. Additional information may be found in section 8.2.8.6 (Atomic Energy Act of 1954), and section 8.2.10.3 (DOE Order 435.1, Radioactive Waste Management).

Non-applicable radiological program requirements during 2004 include:

- 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

TULSA, OKLAHOMA

MAJOR ACTIVITIES IN 2004

All facilities of the NETL office in Tulsa are located in The Williams Center, a downtown office building complex. The offices are leased by DOE from SWPA. In 2004, 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.

Environmental Compliance

Compliance Assessment Process

The Tulsa office, having no laboratory facilities, does not engage in the same compliance assessment processes as the Morgantown and Pittsburgh 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 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 2004.

Compliance Status

Summary of Permits

There are no permits issued to NETL-Tulsa for activities or facilities at the Tulsa office regarding ES&H issues.

Environmental Restoration Activities

CERCLA-type Offsite Cleanups. The Tulsa office had no offsite remediation activities that were ongoing during 2004, and there were no National Priorities List (NPL) sites for which they had liability under CERCLA/SARA.

CERCLA/SARA Onsite Cleanups. There were no onsite CERCLA/SARA cleanups at the Tulsa office in 2004; nor were there any releases that would trigger reporting to DOE Headquarters Emergency Operations Center, the U.S. Coast Guard National Response Center, or any other governmental agency.

RCRA Cleanups. In 2004, 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.

Federal Facilities Compliance Act Actions. The Federal Facilities Compliance Act waived sovereign immunity for the federal government executive agencies regarding the payment of fines and civil penalties for violations of RCRA. There were no occasions in 2004 when EPA's Federal Facilities Division contacted the Tulsa office regarding any possible compliance actions. The EPA and state agencies did not levy any civil fines on the Tulsa office in 2004.

TSCA Actions. Tulsa's staff are not aware of any spills or releases of TSCA-regulated substances (e.g., pesticides, PCBs, formaldehyde, methylene chloride, asbestos). Any removal or remediation actions would be undertaken by the landlord through the building management organization.

FIFRA Actions. In 2004, there were no restricted-use pesticides, herbicides, or defoliants kept or used by NETL staff in Tulsa. Applications of pesticides inside and outside the building and the application of herbicides were under the control of the landlord and the building management organization. Tulsa staff are not aware of any spills or releases of these FIFRA-regulated substances.

Waste Management and Pollution Prevention Activities

RCRA Program. RCRA classifies sites as generators, transporters, treatment facilities, storage facilities, or disposal facilities. The Tulsa office of NETL holds no RCRA permits and does not engage in RCRA-regulated activities.

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

The Tulsa office does not have aboveground or underground storage tanks for fuel or other materials.

TSCA Program. In 2004, the Tulsa office housed no TSCA-regulated substances.

FIFRA Program. In 2004, there were no restricted-use pesticides, herbicides, or defoliants kept within the offices. The landlord and building management organization provide pest control services and grounds keeping services.

Pollution Prevention Program. Because of the nature of the work (contracts administration), the small number of employees (47), and the waste management services provided by the landlord under the terms of the lease agreement, the Tulsa office has never formally implemented a pollution prevention program. At NETL, pollution prevention is used in a broad sense that includes some things done by the Tulsa staff, such as affirmative procurement (i.e., the procurement of goods containing recycled content or having less life-cycle impact on the environment), contribution to the landlord's onsite recycling efforts, donation of unwanted personal computers (PCs), and energy-saving steps such as turning off lights and PCs when not in use.

Recycling efforts are managed by the building management contractor and include: office paper, aluminum cans, light bulbs, light ballasts, dry-cell batteries, and toner cartridges. Bins for

recyclable materials are provided in common areas on each floor by building management, and NETL provides its staff with containers for their offices. SWPA reports all waste generated. The Tulsa staff recycled 51 toner cartridges in 2004.

Except for toner cartridges, no statistics are kept on the NETL contribution to recycling or on the total amounts of waste generated; however, NETL staff members are working to obtain the amounts associated with the Tulsa office.

Radiation Protection Activities

Ionizing Radiation Program. There are no ionizing radiation sources at the Tulsa office.

Laser Program. The Tulsa office 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, 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.

Air Quality and Protection Activities

As an administrative office, Tulsa has no air quality protection program and no emissions that require monitoring, reporting, or permits. In 2004 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the Tulsa office. Operation of the Tulsa office does not contribute significantly to any violations of National Ambient Air Quality Standards (NAAQS). There are no Tulsa office facilities or projects that are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAPS) program – 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.

Surface 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. Tulsa office activities in 2004 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

In 2004, 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.

Ground Water and Soil Quality and Protection Activities

There are no ground water or soil quality protection activities for the Tulsa office.

Compliance with Other Major Environmental Statutes

SARA Title III, EPCRA. The Tulsa office does not use or store hazardous materials in excess of threshold quantities that would trigger EPCRA reporting or emergency response planning. Therefore SARA Title III planning notification (sec. 302-303), EHS release notification (sec. 304), MSDS/chemical inventory (sec. 311-312), and TRI reporting (sec. 313) do not apply. In 2004, the Tulsa office did not use or store more than 2 pounds of any of the more than 300 extremely hazardous chemicals found in 40 CFR 355, Appendix A.

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 2004, all funded projects were determined to fall within the realm of categorical exclusions. There were approximately 33 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.

Endangered Species Act. Urban development occupies all of the space immediately surrounding the building that houses the Tulsa office. The office should not impact any threatened or endangered species. Before contracts are made for financial support of R&D projects, applicants must provide information on potentially impacted threatened or endangered species and their critical habitats. These issues are considered during the NEPA process.

National Historic Preservation Act. Operations at the Tulsa office do not impact surrounding buildings or neighborhoods. The Williams Center is much less than 50 years old, so this building complex does not qualify for protection under the National Historic Preservation Act. Before contracts are made for financial support of R&D projects, applicants must provide information on historic structures, cultural resources, and Native American interests that potentially could be impacted. These items are considered during the NEPA process.

Migratory Bird Treaty Act. The Williams Center is a high-rise modern office building. There is no indication that migratory bird species roost on the building or that migratory birds use any areas around the building complex. Migratory bird issues are addressed as a part of the NEPA process before contracts for financial assistance are awarded. NETL does not knowingly support projects that would adversely impact protected migratory bird species.

Atomic Energy Act of 1954 (42 USC 2011 et seq.). There are no radiation sources at the Tulsa office; therefore, there is no radiation protection program.

Executive Orders

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 Tulsa office has one van, which is owned by GSA. This van is

ethanol compatible, but no ethanol fuel supplies are available locally. The Tulsa vehicle is included in the NETL statistics that are reported to Headquarters.

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 building and facilities consist of one-and-a-half floors 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.

This EO focuses heavily on pollution prevention activities. The Tulsa office does not have a formal pollution prevention program; however, staff members are involved through activities as described under the Pollution Prevention Program section above.

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 the Tulsa office, electricity costs are included in rent. Lights and air conditioning are governed by a building energy management system that uses timers – 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 are involved in informal education such as posters and containers for recyclables in their offices.

EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition. EO 13101 establishes a general approach and goals for affirmative procurement and for recycling activities by federal agencies. The Tulsa office participates in a recycling program established by the landlord and the building management contractor (TRIZEG, 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.

Affirmative procurement means the purchasing of goods and services that have a lesser adverse impact on the environment throughout their lifecycle and that are reasonable for the government to purchase. The Tulsa office purchases office paper made with recycled materials and refilled toner cartridges. Fifty-one toner cartridges were refilled in 2004. Other than toner cartridges, there are no statistics on the amount of materials recycled on behalf of the Tulsa office of NETL.

In 2004, the Tulsa office began using 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 by the Morgantown site warehouse.

EO 11990, Protection of Wetlands. Before contracts are made for financial support of R&D projects, applicants must provide information on wetlands that potentially could be impacted. This information is considered during the NEPA process.

EO 11988, Floodplain Management. Before contracts are made for financial support of R&D projects, applicants must provide information on floodplains that potentially could be impacted. The extent of floodplain impact is considered during the NEPA process.

DOE Orders

Order 450.1, Environmental Protection Program. Because of the relatively benign onsite activities of the Tulsa office, implementation of onsite environmental protection programs has not been needed. NEPA processes are used to address potential concerns associated with offsite projects funded under contract with the Tulsa office.

Order 231.1, Environment, Safety, and Health Reporting. Every field office must report information on ES&H issues. NETL is accountable to DOE Headquarters and to regulatory agencies to provide timely data reporting. The Tulsa office sends data to the Pittsburgh site of NETL for inclusion within the comprehensive NETL reporting (see section 8.2.10.2) make sure reference is still correct

Order 435.1, Radioactive Waste Management. There are no radiation sources at the Tulsa office; therefore, there is no radioactive waste management program.

Other Major Environmental Issues and Actions

Staff at the Tulsa office is not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, non-routine releases of pollutants, compliance agreements, cleanup agreements, or unresolved compliance issues. There were no audits conducted in 2004 under the sponsorship of DOE Headquarters.

FAIRBANKS, ALASKA

MAJOR ACTIVITIES IN 2004

The Arctic Energy Office (AEO) is located in rented office space in the Duckering Building on the campus of the University of Alaska at Fairbanks. In 2004 AEO 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.

Environmental Compliance

Compliance Assessment Process

AEO, having no laboratory facilities, does not engage in the same compliance assessment processes as the Morgantown and Pittsburgh sites. Because building and facility operations and maintenance are under the control of the University of Alaska, AEO itself has to comply with few environmental, safety, or health regulations. Therefore, the office does not undertake in-house audits, external audits, or subject matter reviews; and regulatory agencies do not conduct environmental, safety, or health inspections or investigations of the office's in-house activities. However, regulatory agency inspections (e.g., by the local fire marshal or municipal building inspectors) of the building and facilities could occur with findings assessed against the University.

The State of Alaska, North Star Borough, and the city of Fairbanks do not impose recycling requirements. Nevertheless, North Star Borough and the University of Alaska have arranged for limited recycling activities for the community.

In 2004, there were no citations for violations of environmental, safety, or health laws, regulations, or ordinances.

Compliance Status

Summary of Permits

There are no permits issued to AEO for onsite activities or facilities.

Environmental Restoration Activities

CERCLA-type Offsite Cleanups. AEO has no offsite remediation activities that were ongoing in 2004.

CERCLA/SARA Onsite Cleanups. There were no onsite CERCLA/SARA cleanups at AEO in 2004, nor were there any releases that would trigger reporting to DOE Headquarters Emergency Operations Center, the U.S. Coast Guard National Response Center, or any other governmental agency.

RCRA Cleanups. In 2004, 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 in prior years.

Federal Facilities Compliance Act Actions. AEO staff are not aware of any occasions in 2004 when EPA's Federal Facilities Division contacted the office regarding any possible compliance actions. The EPA and state agencies did not levy any civil fines on AEO in 2004.

TSCA Actions. AEO staff are not aware of any spills or releases of TSCA-regulated substances (e.g., pesticides, PCBs, formaldehyde, methylene chloride, asbestos). Any removal or remediation actions at the office would be undertaken by the University.

FIFRA Actions. In 2004, there were no restricted-use pesticides, herbicides, or defoliants kept or used by AEO staff. Applications of pesticides inside and outside the building and the application of herbicides were under the control of the University. AEO staff are not aware of any spills or releases of FIFRA-regulated substances (e.g., pesticides, herbicides, defoliants).

Waste Management and Pollution Prevention Activities

RCRA Program. AEO holds no RCRA permits and does not engage in RCRA-regulated activities. The office does not have aboveground storage tanks or underground storage tanks for fuel or other materials.

TSCA Program. AEO housed no TSCA-regulated substances in 2004.

FIFRA Program. There were no restricted-use pesticides, herbicides, or defoliants kept within the office. The University provides pest control services and groundskeeping services.

Pollution Prevention Program. 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, AEO has never formally implemented a pollution prevention program. 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), contribute to the local recycling efforts, and undertake 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. AEO ships its spent toner cartridges to the NETL Morgantown site for recycling.

Radiation Protection Activities

Ionizing Radiation Program. There are no ionizing radiation sources in the Fairbanks office.

Laser Program. AEO's onsite lasers include Class I lasers that are built into common office devices such as laser printers and CD readers within PCs. 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 office and is currently viewed as unnecessary.

Air Quality and Protection Activities

As an administrative office, AEO has no air quality protection program and no emissions that require monitoring, reporting, or permits. The office does not own or manage facilities so air quality regulations do not directly apply.

Surface Water Quality and Protection Activities

The University deals with sewer use permits and with storm water runoff control and permits for the Fairbanks office. AEO activities in 2004 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

Ground Water and Soil Quality and Protection Activities

There are no ground water or soil quality protection activities for the Fairbanks office.

Compliance with Other Major Environmental Statutes

SARA Title III, EPCRA. AEO does not use or store hazardous materials in excess of threshold quantities that would trigger EPCRA reporting or emergency response planning; therefore, SARA Title III planning notification (sec. 302-303), EHS release notification (sec. 304), MSDS/chemical inventory (sec. 311-312), and TRI reporting (sec. 313) do not apply. In 2004, the office did not use or store more than two pounds of any of the more than 300 extremely hazardous chemicals found in 40 CFR 355, Appendix A.

National Environmental Policy Act. AEO 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 2004, all AEO-funded projects were determined to fall within the realm of categorical exclusions.

Endangered Species Act. Urban development occupies all of the space immediately surrounding the building that houses AEO. The office should not impact any threatened or endangered species. Before contracts are made for financial support of R&D projects, applicants must provide information on potentially impacted threatened or endangered species and their critical habitats. These issues are considered during the NEPA process.

National Historic Preservation Act. Operations at AEO do not impact surrounding buildings or neighborhoods. The Duckering Building is less than 50 years old so it does not qualify for protection under the National Historic Preservation Act. Before contracts are made for financial support of R&D projects, applicants must provide information on historic structures, cultural resources, and Native American interests that potentially could be impacted. These items are considered during the NEPA process.

Migratory Bird Treaty Act. The Duckering Building is a typical university office building. There is no indication that migratory bird species roost on the building or that migratory birds use any areas around the building. Migratory bird issues are addressed as a part of the NEPA process before contracts for financial assistance are awarded. AEO does not knowingly support projects that would adversely impact protected migratory bird species.

Atomic Energy Act of 1954 (42 USC 2011 et seq.). There are no radiation sources at AEO; therefore, there is no radiation protection program.

Executive Orders

EO 13149, Greening the Government Through Federal Fleet and Transportation Efficiency. AEO has no government maintained vehicles. Employees provide their own transportation for work purposes. AEO staff are conscientious about the energy efficiency of the vehicles they purchase and about their driving habits.

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, AEO 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 Pittsburgh and Morgantown sites. Inclusion of AEO will be considered in the future.

This EO focuses heavily on pollution prevention activities. AEO does not engage in pollution prevention activities other than the ones described under the Pollution Prevention Program section (above).

EO 13123, Greening the Government Through Efficient Energy Management. AEO is constrained by the limitations of the rental agreement in controlling office space energy use. Electricity costs and heating costs are included in rent, so there is minimal incentive to conserve energy. There is no education program on pollution prevention or energy usage; however, employees do turn off lights and PCs when they are not needed.

EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition. AEO participates in a recycling program established by the University and the Borough. Receptacles are provided for the collection of waste office paper, cardboard, and glass bottles. The University sends waste paper and cardboard to a power plant located at the Eielson Air Force Base, where the waste are mixed with coal and burned to generate electricity. Glass bottles are hauled to market in Anchorage.

Affirmative procurement means the purchasing 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. AEO purchases office paper made with recycled materials. Toner cartridges are purchased new because refills are not available locally.

EO 11990, Protection of Wetlands. Before contracts are made for financial support of R&D projects, applicants must provide information on wetlands that potentially could be impacted. This information, which includes the extent of proposed wetland impacts, is considered during the NEPA process.

EO 11988, Floodplain Management. Before contracts are made for financial support of R&D projects, applicants must provide information on floodplains that potentially could be impacted. This information, which includes the extent of possible floodplain impacts, is considered during the NEPA process.

DOE Orders

Order 450.1, Environmental Protection Program. Because of the relatively benign onsite activities of AEO, implementation of onsite environmental protection programs has not been needed. NEPA processes are used to address potential concerns associated with offsite projects.

Order 231.1, Environment, Safety, and Health Reporting. Every field office must report information on ES&H issues. NETL is accountable to DOE Headquarters and to regulatory agencies to provide timely data reporting. AEO sends data to the Pittsburgh site of NETL for inclusion in the comprehensive NETL reporting.

Order 435.1, Radioactive Waste Management. There are no radiation sources at AEO; therefore, there is no radioactive waste management program.

Other Major Environmental Issues and Actions

AEO staff members are not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, non-routine releases of pollutants, compliance agreements, cleanup agreements, or unresolved compliance issues. There were no audits conducted in 2004 under the sponsorship of DOE Headquarters.

10.0 APPENDIX A: ACRONYMS AND TABLES

Acronyms

ACHD	Allegheny County Health Department
AEO	Arctic Energy Office
AIIS	Assessment Information Input System
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
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	Waste Water Treatment Facility

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Table 3.7a. NETL's Environmental Performance Measures		
Measure	Target	End of FY 2004 Status
Environmental performance	85% of Environmental Management Plan (EMP) milestones are achieved.	85% of the EMP milestones were completed.
	100% of the Environmental Management System (EMS) objectives are achieved.	100% of the EMS objectives were completed.
	Less than 50% of prior-year (3) Notices of Violation (NOV) and reportable environmental releases.	There were 2 NOV's in FY2004. Both were for cyanide exceedance at the Waste Water Treatment Facility in PGH, May 24 and July 7, 2004.
ES&H corrective actions	100% of urgent corrective actions are resolved within 7 days.	100% of the urgent corrective actions were resolved on schedule.
	80% of serious corrective actions are resolved within 45 days.	60% of the serious corrective actions were resolved on schedule.
	12 preventive actions are identified.	23 preventive actions were identified.
Independent program review	3 program reviews are conducted.	Independent program reviews were conducted on three ES&H programs: Surface Water Quality Management Program, Lockout/Tagout Program, and Confined Space Entry Program.
EMS assessment and improvement	4 internal EMS audits conducted.	4 audits were completed on schedule.
	4 EMS improvement opportunities identified and implemented.	7 improvement opportunities were identified and implemented.
	80% of EMS corrective actions are resolved within 120 days.	54% were resolved on schedule.
	6-month ISO 14001 surveillance audit is conducted and passed.	Audit passed the week of March 29, 2004.
	30 sets of ES&H training requirements reviewed and revised.	30 sets of training records were reviewed and revised as necessary.
EMS updates	EMPs are reviewed, updated, and posted to the Intranet by March 2004.	All EMPs were updated and posted on schedule.
	EMS targets and objectives are reviewed, updated, and posted to the Intranet by March 2004.	All targets and objectives were updated and posted on schedule.
	Data on environmental aspects is reviewed, updated, and posted on the Intranet by March 2004.	Environmental aspects were updated and approved by the EMS representative and posted on schedule.
ES&H directives	100% of required ES&H directives are issued.	100% of the directives were completed and issued.
	90% of ES&H directives are reviewed and revised according to schedule.	98% of the directives were revised on schedule.
	Integrated Safety Management (ISM) plan is updated.	NETL Order 450.4-1B, Integrated ES&H Management Plan was updated and reissued.

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Table 3.7b. 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, boilerhouse
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

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**Table 4.1. 2004 Quarterly Operations and Emissions Reports
for Gas Process Development Unit**

QUARTER 1: January 1, 2004 through March 31, 2004

PROJECT STATUS: No operations were conducted during the reporting period. All efforts were directed at making various mechanical improvements to the unit and procuring a replacement filter element assembly for the secondary fuel gas filter (air pollution control device number 2c).

During the next reporting period, the replacement filter element assembly will be received and installed, and other preparations for testing should be completed. Then, if permission is received under a separate letter, a new sorbent (RTI-3) will be loaded into the PDU, and another hot integrated shakedown test with the Syngas Generator will be conducted.

OPERATIONS SUMMARY: There were no reportable hours of operation.

January: 0 hours

Breakdown of January for emission point number 1e

None

March: 0 hours

Breakdown of March for emission point number 1e

None

February: 0 hours

Breakdown of February for emission point number 1e

None

QUARTER 2: April 1, 2004 through June 30, 2004

PROJECT STATUS: No operations were conducted during the reporting period. New filter element assemblies for the Secondary Fuel Gas Filter (air pollution control device number 2c) and the Secondary Regeneration Gas Filter (air pollution control device number 4c) were received and installed. Progress continued in making various mechanical improvements to the unit. Permission was received from the West Virginia Department of Environmental Protection to use an alternate sorbent (RTI-3) in future testing, and a shipment of the new sorbent arrived. During the next reporting period, the steam piping modifications necessary to test RTI-3 sorbent will be completed, and preparations for the next shakedown test will begin. This next test, which is expected in September or October, will strive to demonstrate continuous sulfidation-regeneration operation with RTI-3 sorbent and will be similar to the previous shakedown tests with EX-SO₃ sorbent (May and September 2003).

OPERATIONS SUMMARY: There were no reportable hours of operation.

April: 0 hours

Breakdown of April for emission point number 1e

None

June: 0 hours

Breakdown of June for emission point number 1e

None

May: 0 hours

Breakdown of May for emission point number 1e

None

QUARTER 3: July 1, 2004 through September 30, 2004

PROJECT STATUS: Steam piping modifications necessary to test T-2749 (formerly RTI-3) sorbent were completed, and preparations for the next shakedown test began. This included efforts to remove the previously used EX-SO₃ sorbent still remaining in the unit and test firing of the incinerator. An operational safety review (required of all NETL projects) for testing T-2749 sorbent was successfully completed.

During the next reporting period, a shakedown test will hopefully be conducted in the late-October to November time frame. This next test will strive to demonstrate continuous sulfidation-regeneration operation with T-2749 sorbent and will be similar to the previous shakedown tests with EX-SO₃ sorbent (May and September 2003).

OPERATIONS SUMMARY: The reportable hours of operation are given in the attached tables. The hours are all associated with sorbent removal and incinerator firing activities (emission point number 2e). There were no reportable flare emissions (emission point number 1e).

July: 0 hours

Breakdown of July for emission point number 1e

None

September: 13.78 hours

Breakdown of September for emission point number

1e

August: 0 hours

Breakdown of August for emission point number 1e

None

None

**Table 4.1. 2004 Quarterly Operations and Emissions Reports
for Gas Process Development Unit**

QUARTER 4: October 1, 2004 through December 31, 2004

PROJECT STATUS: In preparation for the integrated shakedown test planned for this quarter, the Syngas Generator was fired for short duration to check responses of thermocouples that had been newly installed in protection tubes to enhance thermocouple durability. Also, residual EX-SO₃ sorbent in the PDU from previous shakedown tests was thoroughly removed to prepare the system for loading new T-2749 sorbent. The incinerator was also fired in case any soot in the system was dislodged by air flow used during sorbent removal activities. An upper management decision led to cancellation of the planned shakedown test prior to the anticipated November 8 startup. The project has now been placed on hold and no further test activities are scheduled at this time.

OPERATIONS SUMMARY: The reportable hours of operation are given in the attached tables. There were 4 hours of Syngas Generator firing with reportable flare emissions (emission point number 1e). Except for a brief period of stand-alone incinerator operation, the remaining hours were all from sorbent removal activities in conjunction with incinerator firing (emission point number 2e).

October: 16.67 hours

Breakdown of October for emission point number 1e

October 15 = 240 minutes; No sulfuric acid used

Total = 240 minutes = 4.00 hours

December: 0 hours

Breakdown of December for emission point number

1e

None

November: 5.5 hours

Breakdown of November for emission point number 1e

None

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Table 5.2.2b. 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			

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**Table 5.2.6c. NETL-Morgantown 2004 Waste Water 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	0.007	0.005	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.004
Daily Max	0.15	0.01	0.01	0.03	0.05	0.02	0.06	0.02	0.02	0.02	0.02	0.02	0.01
BOD5													
Monthly Avg	None	0.2	0.2	1.1	0.3	0.2	0.3	0.2	0.2	1.0	0.22	0.3	0.1
Daily Max	None	0.3	0.3	3.3	0.8	0.4	1.0	0.3	0.3	2.0	0.43	0.5	0.2
TSS													
Monthly Avg	None	0.6	1.9	1.0	0.8	0.5	2.5	0.6	0.4	3.7	0.4	1.2	0.2
Daily Max	None	0.8	3.8	3.0	2.1	1.0	7.5	1.2	0.8	7.3	0.8	2.3	0.6
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	0.0001	0.0002	ND	ND	ND	ND	0.0001	ND	ND	ND
Daily Max	None	ND	ND	0.0003	0.0004	ND	ND	ND	ND	0.0002	ND	ND	ND
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	0.006	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.004	0.002	0.002	0.002
Daily Max	0.06	0.008	0.002	0.005	0.004	0.004	0.005	0.002	0.002	0.008	0.008	0.008	0.006
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	0.0003	ND	ND	ND	ND	ND	ND	0.0008	ND	ND	ND
Daily Max	0.038	ND	0.0005	ND	ND	ND	ND	ND	ND	0.0015	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	0.0005	0.0003	0.0008	0.0008	ND	ND	ND	ND	0.0004	ND	ND	0.0002
Daily Max	0.015	0.0008	0.0006	0.003	0.002	ND	ND	ND	ND	0.0008	ND	ND	0.0004
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	0.006	0.02	0.04	0.02	0.006	0.008	0.003	0.005	0.009	0.006	0.007	0.05
Daily Max	0.3	0.008	0.03	0.13	0.05	0.008	0.03	0.007	0.01	0.018	0.012	0.013	0.013
Iron													
Monthly Avg	None	0.03	0.04	0.04	0.06	0.04	0.06	0.02	0.01	0.10	0.01	0.02	0.01
Daily Max	None	0.04	0.08	0.11	0.16	0.07	0.19	0.03	0.03	0.20	0.03	0.03	0.03
Manganese													
Monthly Avg	None	0.006	0.006	0.05	0.04	0.04	0.04	0.01	0.01	0.01	0.007	0.01	0.005
Daily Max	None	0.008	0.013	0.16	0.10	0.07	0.13	0.03	0.02	0.03	0.01	0.02	0.012
Phenolics													
Monthly Avg	None	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0003
Daily Max	None	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0008

**Table 5.2.6c. NETL-Morgantown 2004 Waste Water 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	0.002	0.002	0.004	0.008	0.004	0.01	0.004	0.005	0.003	0.003	0.006	
Monthly Avg	None	0.003	0.003	0.01	0.019	0.008	0.03	0.008	0.009	0.005	0.007	0.008	0.002
Daily Max													0.006
Organics													
Alachlor-1254	None	NS	NS	NS	NS	NS	NS	ND	NS	.NS	NS	NS	NS
All other parameters	None	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
pH (s.u.)													
Minimum	6.0	6.8	6.7	6.4	6.4	6.7	6.1	7.1	6.1	6.4	7.4	7.8	8.4
Maximum	9.0	8.5	8.7	8.4	8.4	7.7	8.0	8.2	8.3	8.4	8.7	8.4	8.9

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

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Table 5.2.7a. NETL-Morgantown April - May 2004 Ground Water 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)	6.6	6.2	6.2	6.2	6	P&A	7.3	5.9	P&A	6.7	5.0	6.9	6.9
Specific Conductance (µmhos)	175	250	334	295	395	P&A	3951	4790	P&A	989	2865	549	2255
Temperature (°C)	15.8	15.6	15	15.4	15.5	P&A	15.8	14	P&A	14.6	16.7	13.6	15.7
Cadmium (total, mg/L)	NT	NT	NT	NT	NT	P&A	ND	.00074	P&A	.00092	.00063	.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	51	210	P&A	540	47	210	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	37	50	P&A	160	94	66	NT
Total Recoverable Phenolics (mg/L)	NT	NT	NT	NT	NT	P&A	ND	ND	P&A	ND	.02	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 5.2.7b. NETL-Morgantown September - October 2004 Ground Water 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)	6.6	6.4	6.2	6.2	6.2	P&A	7.0	6.4	P&A	6.5	5.3	5.1	6.7
Specific Conductance (µmhos)	143	242	195	311	389	P&A	3848	4798	P&A	1098	2975	608	1206
Temperature (°C)	15	15.1	13.7	16.4	16.6	P&A	15.9	14.7	P&A	14.5	18.7	15.2	15.9
Cadmium (total, mg/L)	NT	NT	NT	NT	NT	P&A	ND	.001	P&A	.00055	.00062	.0013	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	35	210	P&A	200	43	180	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	30	58	P&A	130	85	65	NT
Total Recoverable Phenolics (mg/L)	NT	NT	NT	NT	NT	P&A	ND	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 5.2.7c. NETL-Morgantown April 2004 Ground Water Data for “B-C” Aquifer

Parameter	Sample Location					
	11	SP2-BC	32A	31	GAS-5	STRET3
pH (s.u)	6.1	6.4	4.9	5.5	6.6	5.65
Specific Conductance (µmhos)	175	485	4074	941	868	92
Temperature (°C)	15	14.8	13	14.9	13.4	13.4

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

Table 5.2.7d. NETL-Morgantown October 2004 Ground Water Data for “B-C” Aquifer

Parameter	Sample Location					
	11	SP2-BC	32A	31	GAS-5	STRET3
pH (s.u)	6.2	6.3	5.1	5.2	6.3	5.8
Specific Conductance (µmhos)	84	472	2809	713	867	47
Temperature (°C)	15.2	13.9	18.8	16.3	17.9	15.8

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

Table 5.2.7e. NETL-Morgantown April 2004 Ground Water Data for Morgantown Aquifer				
Parameter	Sample Location			
	D1M	D2M	D3M	D4M
pH (s.u)	6.4	9.1	NT	6.5
Specific Conductance (µmhos)	424	763	NT	392
Temperature (° C)	15	15.8	NT	13.2

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

Table 5.2.7f. NETL-Morgantown October 2004 Ground Water Data for Morgantown Aquifer				
Parameter	Sample Location			
	D1M	D2M	D3M	D4M
pH (s.u)	6.6	9.3	7.9	6.7
Specific Conductance (µmhos)	417	548	438	423
Temperature (° C)	15.5	14.9	13.7	14.2+

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

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Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
NETL PPOA	Coal ash	Discuss with local municipality potential as an antiskid material	Complete	Rejected by Pleasant Hills Public Works Dept.
		Discuss w/NIOSH availability of their coal ash for recycling. Intent to combine their larger quantity with NETL's smaller quantity	Complete	Received NIOSH ash sample for analysis. NETL eliminated NIOSH ashes for consolidation due to high carbon content.
		Contact concrete/lightweight aggregate block manufacturer to determine feasible course of action.	Complete	Called Trumbel Corp. in PGH. Determined what they possibly would need on a yearly basis. Determination was that the quantity of ash from NETL was too small.
		Discuss with NETL Site Operation Division (construction) the feasibility for use of NETL ash as fill material for onsite projects	Complete	An onsite NETL person was contacted in an attempt to determine if the combustion research-derived fly ash/bottom ash would be suitable for use in building an onsite walking trail. There was a decision to not build the trail at the time.
	Hire Ash Marketer to identify best reuse pathway	Complete	This is now a moot point since the 500 lb/hr RD unit at NETL has been shutdown; therefore there is currently no significant ash production.	
	Wastewater treatment sludge	Explore alternative to ferric chloride as coagulant medium for sludge reduction	In progress.	A report was prepared by an outside consultant and the conclusion was to conduct jar tests

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
				to evaluate the effectiveness of using less ferric chloride versus using Nelmet. Jar test procedures have been written. Estimates for performing the Testing are being solicited.
		Reduce weight of sludge by drying in existing Bldg 83 coal drying oven feasibility study	Completed	Determination made that ovens are too small to economically dry the sludge in this manner, no further consideration being given to using on site drying ovens.
		Reduce weight of sludge by passive de-watering (semi-permeable membrane). Conduct feasibility study.	Completed	A moisture analysis was performed and moisture content was found to be tightly bound, 70%-80% moisture. Contacted Municipal Market Manager, Miratech Division - Ten in Dec., 2004. Stated that Geotube Technology is designed to contain and dewater sludge and it generally achieves the same percent solids as that achieved with the filter press currently in use at NETL. NO further action will be taken based on results showing no advantage versus using current filter press technology.
NETL PPOA	Wastewater treatment sludge	Reduce weight of sludge by passive de-watering. Permit sludge to dry on filter leaves between filter press runs. Conduct feasibility study.	In progress. Measured results of totally passive drying, recommend	Analyzed this option by quantifying water waste reduction over a two week period, reported

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
			optimization for this opportunity.	to be representative of time period between sludge filtering The moisture content of the sludge was reduced from 80% to 66%. This passive drying technique could result in a 700 lb. reduction in the 20,000 lb. annual generation average. Value of 700 # reduction is $(700\#/8.328\#\text{per gal.}) \times \$1.20\text{per gal.} = \$101.00$. Recommend development of efforts to increase passive drying by improving the micro environment around the filter cake, i.e. more distance between filter plates for better drying air circulation, methods that can prevent the filter cake from falling into collection drum, and measure volume reduction because disposal is cost per unit volume.
U.S.Filter (Chester Engineer's) WWTF Assessment	Wastewater treatment sludge	Reduce sludge generation by optimizing agglomerant (ferric chloride) addition. Assessment called for 1/6th of current injection rate to accomplish a 50% reduction in sludge generation.	In planning	A report was prepared by an outside consultant (Veolia, 5/12/2004) and the conclusion was to conduct jar tests to evaluate the effectiveness. Jar testing will be conducted in FY05.
NETL PPOA team focusing on sludge disposal reduction	Wastewater treatment sludge	Reduce sludge disposal by active drying equipment commercially available low energy sludge drying equipment.	Completed	U.S. Filter's J-Mate (J-batch drying system is suitable sized for NETL needs. It uses a low temperature batch drying system employing infrared heating elements. Vendor reports reduction

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
				<p>in filter cake weight by 66%. Maximum expected reduction for NETL = 13,200# per year. Cost for disposal is \$1.20 per gallon. Volumetric reduction potential is 13,200#/8.32823#per gal., or 1585 gal. Value of total reduction potential is \$1902. Cost of the system is \$22,750. 10 year payback is considered not cost effective.</p>
NETL 2003 PPOA	Wastewater treatment sludge	Reuse onsite as Construction Fill Material	Complete	<p>Contacted PADEP Representative. His determination was that the NETL industrial sludge would not be covered by the PADEP Clean Fill Policy because the sludge does meet the definition of clean fill (soil, rock, stone, etc.) In addition he doubts the feasibility of obtaining a Beneficial Use Permit to mix sludge as a coproduct with other construction fill materials because of the high moisture content of the sludge.</p>
NETL 2003 PPOA	Wastewater treatment effluent	Route/reuse treated effluent as Bldg. 84 Satellite Boiler Makeup Water	Complete	<p>A consultant prepared a report addressing this (as well as the items listed below). The conclusion was that the cost would be approximately \$745K. This includes the effluent uses listed below. Costs currently deemed to be too expensive for return on</p>

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
				investment.
		Route/reuse treated effluent as Computational Chemistry Building non-potable water supply/boiler feed water	Complete	A consultant prepared a report addressing this. See above.
		Route/reuse treated effluent as Building 94 chiller cooling water	Complete	A consultant prepared a report addressing this. See above.
	Route/reuse treated effluent as general purpose OST cooling water	Complete	A consultant prepared a report addressing this. See above.	
	Solvent-contaminated debris	Characterize nature of solvent-contaminated debris to determine proper classification as RCRA or non-RCRA hazardous	Complete	Due to economies of scale, hazardous/non-hazardous waste determination is now made based on generator interviews. Subsequent disposal is performed as appropriate.
		Develop point-of-generation segregation program – all types of debris	Complete	Due to reduction in larger scale research facilities there are only small quantities now being generated. Current method of turning in debris to a central location is sufficient.
Clarify status of oily rag laundering program – both campuses		Complete	Note 8/4/2004 The final analysis on the oily rag issue is: Morgantown - Used rags are too oily to launder. Pittsburgh - Rags from vehicle maintenance are used until non-reusable, and then disposed of. Rags used are presently in a rag laundering program.	
NETL PPOA	Solvent-	Formulate waste segregation training program for	Complete	A hazardous waste computer based

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
	contaminated debris	all employees as applicable		training course was made available to all employees (required for all employees).
	MGN photolab waste	Consider converting photo operations to 100% digital	Complete	NETL photo operations have converted to 100% digital photography.
	Construction/ demolition waste	Revise A/E contract SOWs to incorporate P2/Waste Min and ISO 14001 principles for flowdown to construction contractors.	Complete	Now standard part of all NETL packages.
		Revise A/E contracts to include provisions requiring contractor/subcontractor accountability for waste generation	Complete	In all construction packages.
		Revise A/E contracts to offer financial incentives to contractors/subcontractors for practicing P2/Waste Min	Complete	Most likely will not occur due to insufficient quantities of reusable construction demolition scrap.
		Incorporate P2 into the bid evaluation process and include P2 as an evaluation criterion for the award of subcontracts	Complete	Apply P2 aspects to the bid evaluation process for renovation projects that produce enough demolition waste to justify the added effort.
NETL PPOA	Construction/ demolition waste	Assemble and provide to SOD a list of vendors for construction materials manufactured with recycled content	Complete	List prepared and submitted.
		Assemble and provide to SOD a list of vendors who will accept demolition debris/construction leftover materials	Complete	List prepared and submitted.
Opportunity identified during routine evaluation of	Glycols/ antifreeze	Evaluate the feasibility of replacing existing practices which involve replacing spent glycols used in HVAC and research heat exchange systems with commercially available glycol	In planning	Considering the purchase of unit for in-line filtration of glycol solutions.

Table 8.2.3.c NETL Pollution Prevention Opportunity Assessment (PPOA)

Identified by	Waste category	Reduction opportunity approach	Status	Action taken
Quarterly Waste Report		filtration/renewal/ conditioning systems		
Waste Minimization, Pollution Prevention, and Recycling Program Manager	paper	Have duplex-capable network printers set to a default for printing double-sided copies.	In progress	Feasibility request submitted on 1/11/05. Waiting for response.
Waste Minimization, Pollution Prevention, and Recycling Program Manager	paper	Expand recyclable paper categories to include CFRs, catalogs, and hard-bound books for recycle	Complete	Contacted Davidow Sons – NETL-PGH paper recycler, on Tuesday, Jan. 11, regarding the possibility of them accepting CFRs, catalogs, and hard-bound books for recycle. Response- they would accept the CFRs, catalogs, and hardback books if the covers are removed if they were kept separate from the other items. This was communicated to the NETL-PGH subtask COR to be applied to the current contract providing recycling support if it can be incorporated into the current support activity.

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Table 8.2.6 a
Wastewater Treatment Facility Effluent Analysis (mg/L)

Constituent	Permit Limit	01/06	02/10	03/09	04/06	05/04	06/08	07/07	08/10	09/08	10/05	11/08	12/14
		CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E	CT&E
Aluminum	None	1.2	0.63	0.60	0.38	0.69	0.70	1.1	0.86	0.80	0.33	0.14	0.41
Cadmium	None	ND	ND	ND	ND	0.0034	ND	ND	ND	ND	ND	ND	ND
Chromium	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.022	0.070
Cooper	0.08	ND	ND	0.0057	ND	ND	ND	ND	ND	0.0067	0.0074	0.0052	ND
Cyanide (free)	<0.005	ND	ND	ND	ND	ND	ND	0.016	ND	ND	ND	ND	ND
TOX	None	ND	ND	0.045	ND	ND	ND	ND	ND	ND	0.034	0.038	ND
Iron	None	0.082	0.16	0.13	0.063	0.15	ND	0.064	ND	ND	ND	ND	0.11
Lead	None	ND	ND	ND	ND	0.0081	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	0.0058	ND	ND	ND	ND	ND	ND	ND
Oil & Grease	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5
pH (s.u.)	6.0 – 9.0	7.3*	8.5*	7.4*	7.6*	7.5*	8.3*	7.4*	8.1*	7.0*	7.8*	8.6*	6.6*
Phenolics	0.025	ND	0.0056	ND	ND	ND	0.0077	ND	ND	ND	ND	ND	ND
TSS	None	7.0	ND	ND	ND	ND	5.0	9.0	ND	8.0	ND	ND	ND
Tin	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloromethane	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.032	0.029

	Exceeds PHA Limits
*	Field Measurement

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Well	Sample Date							
	05/05/04				10/06/04			
Constituents	pH	Specific Conductance	Temperature	TPH-DRO	pH	Specific Conductance	Temperature	TPH-DRO
VFW-2	6.97	2790	12.4	ND	6.77	2140	14.5	ND
VFW-4	6.91	3910	15.3	ND	6.80	2040	15.5	ND
VFW-7	6.95	5630	12.4	ND	6.60	6300	15.8	ND
VFW-10	7.16	2980	12.5	ND	6.72	1610	15.5	ND
VFW-11	7.30	2960	12.1	ND	6.48	1640	14.6	ND
VFW-12	7.20	2980	11.0	ND	6.60	1760	14.6	ND
VFW-14	7.04	3950	12.5	ND	6.72	2190	14.4	ND

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