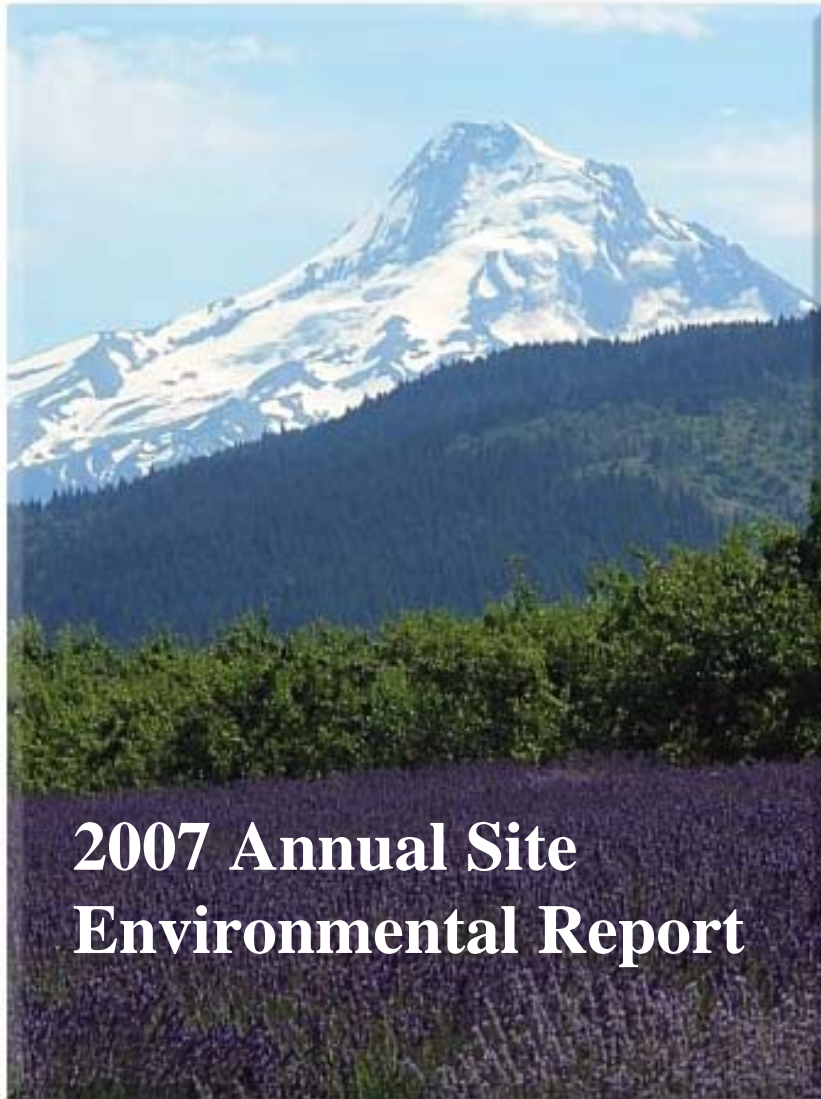


**U.S. Department of Energy • Office of Fossil Energy  
National Energy Technology Laboratory**



**2007 Annual Site  
Environmental Report**



# **2007 Annual Site Environmental Report**

October 2008

U.S. Department of Energy  
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## 2007 NETL ANNUAL SITE ENVIRONMENTAL REPORT

### 1 EXECUTIVE SUMMARY

The National Energy Technology Laboratory (NETL) was able to continue its exceptional success in its environment, safety and health programs throughout 2007. The Albany, Morgantown, and Pittsburgh operations continued to maintain ISO 14001 certification. In addition, substantial progress continued to be made assuring that the Albany site becomes fully integrated with NETL's environmental strategy. There were no (0) environmental violations cited in 2007, and the comprehensive and thorough approach to environmental compliance implemented at NETL uncovered no (0) issues of noncompliance.

Of significance in 2007 was the certification of the Pittsburgh and Morgantown sites to the Occupational Health and Safety Assessment Series (OHSAS) 18001 developed



by the British Standards Institute. The OHSAS 18001 standard is very similar to the ISO 14001 standard, but applies to safety and health management systems in the way that ISO 14001 applies to environmental management systems. OHSAS 18001 goes hand in hand with ISO 14001 and was the next logical step in the continual improvement of NETL's Environmental Management System. The combined environmental and safety management systems

are identified throughout the remainder of this report as the Environmental Management System (EMS).

NETL establishes environment, safety and health objectives and targets annually. Each objective and target is associated with an environment, safety and health management plan which outlines the tasks, milestones, and methods by which each objective and target will be met. Many objectives and targets are set by [Executive Order 13423](#) *Strengthening Federal Environmental, Energy, and Transportation Management* which was issued on January 26, 2007. The order presented several new challenges which NETL has fully addressed through the objectives and targets that are included in the EMS.

Other objectives and targets are set by the Management Review Team (MRT) which ensures that the policy and system remain appropriate and effective. The EMS representative conducts semi-annual review meetings with the Management Review Team (MRT) during which the MRT reviews the ES&H policy, objectives, targets, internal audits, external audits, and other related issues. All MRT requested changes to the EMS are documented and implemented. Management involvement ensures that the EMS is funded and the appropriate priorities are established. Notes from the



MRT meetings are posted to the NETL intranet so that all employees may access them.

In 2007, the MRT was concerned about interface issues between the Site Operations Division and the various divisions within the Office of Research and Development. A team was created to study these issues and make recommendations for improvement. The MRT also encouraged upgrading or replacing the Assessment Information Input System (AIIS) and the Albany Trackwise® system, which are the two corrective action tracking systems currently in use in Morgantown/Pittsburgh and Albany, respectively.

NETL is working to develop a new, consolidated, corrective action tracking system to replace these 2 systems. The new system will be used by all of NETL and will incorporate a host of improvements based on user feedback. Several commercial and in-house systems have been reviewed and it is hoped that a new system will be available for testing sometime in 2008.

NETL was in full compliance with all applicable environmental executive orders in 2007. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental noncompliance.

NETL neared completion of construction of the new Technology Support Facility (TSF) in Morgantown during 2007. Installation of structural steel windows, stone façade, roof penthouse overhead extension, and the building roofing system was completed. When finally completed in 2008, the TSF will be a multi-story, 106,000-square foot structure housing 168 offices. The facility is designed and constructed to U. S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Gold Certification standards. The facility will be one of the most energy efficient and cost effective federal structures built to date.



There were three ongoing compliance activities in the state of Wyoming and one close-out activity in Texas in 2007. Two of the sites in Wyoming required on-going active remediation activities and the other site in Wyoming has been cleaned-up and is subject only to vegetation surveillance monitoring. The two active sites have volatile and semi-volatile organic contaminants in the groundwater of which the primary organic contaminants of concern are benzene, toluene, ethylbenzene, and isomeric xylene (BTEX) compounds. The groundwater contamination at the two active sites is the result of underground coal gasification and oil shale retorting tests conducted in the 1970's. The non-active sites, one in Wyoming and one in Texas, have been cleaned-up and are being monitored for any residual contamination and eventual closure.

As part of the ongoing commitment to reduce the risks associated with hazardous chemicals under Title III of the Superfund Amendments and Reauthorization Act (SARA) Title III requirements, NETL established targets for reducing hazardous chemicals on site. The intent of these targets is to avoid the unnecessary accumulation of potentially hazardous chemicals in laboratories while maintaining sufficient chemical stores to complete mission-related research. NETL achieved a reduction in the total number of containers holding hazardous materials, surpassing the target by 294 containers. This was achieved through laboratory cleanout and removal of chemicals that were no longer needed. This reduction was assisted by a real-time chemical inventory system that allows employees to update chemical inventory reports while avoiding a time lag in removing chemicals from the inventory list.

Except for naturally occurring radioactive materials (NORM) at the Albany site, all radioactive materials at NETL are limited to research instrumentation that contains sealed radioactive sources and radiation-generating devices. NETL does not generate, process, or treat any radioactive material, nor does it house any temporary or permanent facilities for radioactive waste disposal. An inventory of radiation sources is actively maintained and monitored by the radiation safety officers. Information is retained about the source, isotope, quantity, custodian, location, status, and sealed-source activity as required by Title 10 CFR 835.901(e), DOE Policy 441.1, and NETL Procedure 440.1-17. In addition, NETL implements several best management practices that include following DOE implementation guides, EPA information, NRC information, and Commonwealth of Pennsylvania recommendations and requirements.

Details on each of the above-mentioned subjects, as well as information on other NETL environment, safety and health programs are presented in this report. Many of the questions the public may have about what NETL's efforts to protect the environment can be found in this report. However, questions and comments are always welcome and may be addressed to Dr. Robert Reuther, U. S. Department of Energy – NETL M/S N03, 3610 Collins Ferry Road, P. O. Box 880, Morgantown WV 26507-0880, by e-mail at [Robert.Reuther@NETL.DOE.GOV](mailto:Robert.Reuther@NETL.DOE.GOV), or by telephone at (304) 285-4578.

## **2 INTRODUCTION**

### **2.1 General Information**

The National Energy Technology Laboratory (NETL) is part of the Department of Energy's (DOE) national laboratory system and is DOE's only national laboratory devoted to fossil energy research. NETL supports the DOE mission to advance the national, economic, and energy security of the United States.

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

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

**NETL is organized into seven strategic units:**

The **Strategic Center for Natural Gas and Oil (SCNGO)** integrates all elements of DOE's natural gas and oil research. SCNGO is charged with implementing science and technology development to resolve the environmental, supply, and reliability constraints of producing and using oil and gas resources – resources that account for more than 60 percent of the energy consumed in the United States. With core competencies and expertise in all aspects of natural gas and oil, SCNGO investigates and manages research and development leading to improved natural gas and oil production and use. SCNGO invests



in projects that promise tangible benefits, including a cleaner environment and increased domestic natural gas and oil production.

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

The **Office of Systems, Analyses and Planning (OSAP)** studies large, complex systems, such as industrial or ecological processes, and the interactions among those

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

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

The **Office of Research and Development** (ORD) performs basic and applied research and development in fossil energy and environmental science. Building on historic laboratory strengths and competencies, ORD concentrates on four primary research topics, or focus areas:

- The Energy System Dynamics Focus Area develops natural gas technology with higher efficiencies and lower costs such as advanced gas turbines and fuel cells.
- The Geological and Environmental Systems Focus Area concentrates on the minimization and abatement of environmental problems associated with the use of fossil fuels. Research topics include geological sequestration of carbon dioxide, oil and gas exploration and production, air pollution/particulate matter issues, and removal of toxins from the emissions in coal utilization systems.
- The Computational and Basic Science Focus Area develops tools that enable more rapid and efficient scale-up of new subsystems, devices, and components to commercial scale.



- The Materials Science Focus Area specializes in the life-cycle research of metals, alloys, and ceramics and in the recycling and remediation of waste streams associated with these processes.

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

The **Office of Crosscutting Functions (OCF)** plans, directs, and coordinates policy, administrative, and site support contract management activities that crosscut laboratory activities. The office provides policy direction for the Federal Project Management function, oversight of the performance measurement system, and site support contract management. Particular functional and technical analysts participate individually or with teams to ensure timely information exchange, coordinate responses to action items affecting the Office of Fossil Energy and DOE.

## 2.2 Focused Standards List

NETL is committed to ensuring compliance with all of the environmental requirements impacting the Albany, Fairbanks, Morgantown, Pittsburgh, and Tulsa sites. Compliance with the numerous requirements found in departmental directives; executive orders; federal, state and local codes; federal, state, and local regulations; acquisition letters; negotiated agreements; and consensus standards is extremely challenging. To ensure compliance requirements are met, NETL established a list of requirements specific to NETL operations. This list, NETL's *Focused Standards List*, embodies all of the requirements that apply to NETL operations.

The *Focused Standards List* was created by NETL ES&H subject matter experts who oversee approximately 75 specific [ES&H activities](#) managed by the ES&H Division. Standards and requirements determined by the subject matter experts to be applicable to the NETL ES&H activities are incorporated into one or more NETL directives which provide the policy, plans, and procedures used to implement the standards and requirements. There are 135 directives, comprising 10 orders, 17 operating plans, and 108 procedures. The *Focused Standards List* is reviewed and updated monthly and published to the NETL intranet.

The *Focused Standards List* includes the standard or requirement citation and the location where the standard or requirement may be found. Many of the standards and requirements identified in the *Focused Standards List* are in the public domain and may be found on the internet. Other requirements are copyrighted and must be purchased and copies placed in the libraries. Quarterly, the location that is published for the requirement is verified to ensure that it is still available and annually the *Focused Standards List* is analyzed to ensure that the standards and requirements listed are still applicable to NETL activities. As part of the directives review process, every 3 years all directives are reviewed and updated as needed.



Verification that the standards and requirements listed on the *Focused Standards List* are being implemented occurs through several mechanisms. First, NETL utilizes a rigorous safety analysis review system (SARS) to review projects, operations and facilities to identify and mitigate environmental impact and hazards. Checklists are used to facilitate verification of the standards and requirements to be covered during the review. Also, ES&H subject matter experts provide support to the SARS process and ensure that applicable ES&H standards and requirements are addressed.

Second, NETL has retained the services of an independent third party auditor to perform comprehensive compliance assessments of specific ES&H programs. This auditor performed three such assessments in 2007, the Support Operations Safety Analysis and Review System, the Asbestos Control and Abatement Program, and the Groundwater Quality Management Program.

Third, NETL performs regular walkthrough inspections of site facilities, targeting specific facilities each month so that all NETL facilities are inspected each year. These walkthrough inspections are performed by several ES&H subject matter experts who visually verify that NETL is in compliance with all of the standards and requirements.

Fourth, NETL has a rigorous internal auditing program required by ISO 14001 which conducts two internal audits each year and two surveillance audits. The surveillance audits are conducted by a third party registrar as required by ISO 14001 in order to retain certification.

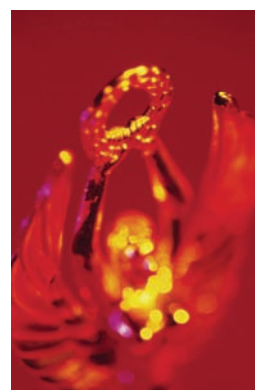
Finally, the preparation of the NETL Annual Site Environmental Report requires a complete review of compliance with all of the major standards and requirements. More than 60 subject matter experts participate in this effort to review the past year's performance in complying with the ES&H standards and requirements on the *Focused Standards List*.

## 2.3 Discussion of Sites within the Document

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

## 2.4 Accomplishments

NETL's efforts are focused on resolving the environmental, supply, and reliability constraints of producing and using America's fossil fuel resources. To accomplish this mission, NETL draws on approximately 1,100 federal and support-contractor employees to implement and manage a broad spectrum of research programs. The laboratory has five sites that span the United States. NETL sites in Pittsburgh, Pennsylvania, and Morgantown, West Virginia, conduct a broad range of research to increase the supply of traditional energy resources, improve the efficiency and environmental performance of power generation plants, and help end users to conserve energy. Researchers at NETL's site in Albany, Oregon, focus on developing advanced materials for use in the energy industry. Sites in Tulsa, Oklahoma, and Fairbanks, Alaska, address challenges unique to those energy-rich regions. All five locations share the same goal: to advance science and technology for a clean, secure energy future.



One measure of NETL's success is the seven R&D 100 Awards that NETL and NETL-supported technologies earned in 2007. These prestigious awards, which the Chicago Tribune dubbed "the Oscars of Invention," are given annually to the 100 most technologically significant new products to hit the market in a given year. According to R&D Magazine, which selects the winning technologies, the goal of the award is "to spotlight major breakthroughs – products and processes with the capacity to improve the standard of living for many people."

Three awards went to technologies developed by NETL scientists: a process to produce titanium products at significantly lower cost; software to reduce the cost and time needed to develop and commercialize advanced coal technologies; and a surveying technique to help prepare abandoned oil and gas wells for carbon storage. Four more technologies that were honored with the R&D 100 Awards were developed with support from NETL.

Some singular accomplishments performed in 2007 are described below:

- Making hydrogen from coal via gasification technology with carbon capture and sequestration is being explored at NETL as the ultimate clean energy use for coal. NETL is exploring ways in which to centrally produce great volumes of ultra-pure hydrogen primarily through advanced separation techniques from coal-derived gases. This included doubling the amount of hydrogen captured by using a selective membrane to remove hydrogen formed by reacting water and carbon monoxide at high temperature. Another project explored the chemical and physical means by which hydrogen is adsorbed on the surface of micro porous materials in an effort to improve hydrogen storage capability. In another project conducted in cooperation with industry, NETL completed initial experiments utilizing a process demonstration unit (PDU) designed to produce hydrogen at practical rates from coal-derived synthesis gas.
- The mercury program is the largest research program in the country for studying fossil-combustion-based mercury emission. In 2007 the program successfully achieved the mercury-reduction goals established by the Office of Fossil Energy a decade ago. In addition, the Strategic Center for Coal and the Strategic Center for Natural Gas and Oil made great strides in 2007 in research and analyses to reduce the electric power sector's use of freshwater; to better manage water produced during oil extraction, gas extraction, and carbon sequestration, and to reduce impacts to domestic land resources.
- Coal-to-Liquids is a program reviewing the option to produce liquid fuels via coal gasification. This program includes analysis of the economic and national security issues related to U.S. dependence on imported liquid fuels. NETL explored the feasibility of a commercial-scale coal-to-liquid plant to produce 50,000 barrels per day using coal gasification and Fischer-Tropsch synthesis to convert high sulfur bituminous coal to diesel fuel, liquid naphtha products, and power. A study was coordinated with the U.S. Department of Defense to examine the feasibility of producing jet fuel from high-sulfur bituminous coal. A novel iron nanocatalyst used in coal-to-liquid conversion was generated and studied. The technical feasibility study on a coal-to-liquids plant in Alaska was issued.
- The Clean Coal Power Initiative is a cost-shared, large-scale technology demonstration program between government and industry. Its goal is to accelerate the commercialization of advanced, affordable, and environmentally sound technologies powered by coal. Under this initiative, the nation's power generators, equipment manufacturers, and coal producers help identify the most critical barriers to coal's use in the private sector and select and demonstrate technologies that will economically meet environmental standards while increasing the efficiency and reliability of coal power plants. In a long-term, full-scale test the outlet mercury emissions measurements consistently showed a 90 percent mercury emission reduction for 48 consecutive days using a



proprietary mercury and multi-pollutant control system. Another technology uses waste heat to reduce the moisture in lignite so that more power can be produced from the fuel.

- The Methane Hydrate Research and Development Program is an on-going collaboration among industry, academia, and government. The program has advanced its research focus to developing technologies that will enable gas hydrate exploration in both marine and Arctic environments. The geophysical team has tested a prototype geophysical sensing system that combined with hydrophones and accelerometers, could lead to a passive seismic technology that will “listen” to natural surface and micro-seismic noise. Researchers working in cooperation with NETL successfully joined a hydrate reservoir simulation code with a geomechanical modeling program.
- The Modern Grid Strategy (MGS) is developing a shared vision for accelerating modernization of the U.S. electricity grid by confronting the barriers that slow progress. In 2007, the MGS team: identified and facilitated the general adoption of seven functional characteristics and five key technology areas of a smart grid by the electric power industry and its stakeholders; assisted the Public Utility Commission of Ohio move forward implementing an advanced metering infrastructure and demand response; and initiated two field tests evaluating the benefits of various approaches to achieving specific functional characteristics of a smart grid.
- NETL is developing advanced exploration, drilling, and recovery technologies to ensure that America’s oil and natural gas resources are recovered to their fullest potential. New sensors and modeling techniques are helping to pinpoint supplies. Enhanced drilling techniques, such as the economic micro-hole technology, are reaching resources once considered unproductive. Enhanced oil recovery (EOR) technologies are helping operators place wells more strategically, identify better injection schemes, and improve reservoir management practices. NETL released two comprehensive reports that provide detailed geologic information of the northern Appalachian basin and northeastern Gulf Coast regions in 2007. NETL also compiled a DVD on the Natural Gas Program Archive that contains reports and data produced during nearly two decades of research by the Office of Fossil Energy.

This is only a sample of the accomplishments made by NETL in 2007. For a more complete description of NETL’s accomplishments, please see [NETL 2007 Accomplishments](#), located on the NETL internet website.

### 3 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

#### 3.1 Introduction to the NETL EMS

The Pittsburgh and Morgantown sites received certification to the ISO 14001 standard, Environmental Management Systems, on August 31, 2003 and the Albany site received certification to ISO 14001 on June 9, 2005. All three sites have maintained those certifications throughout 2007 through surveillance and recertification audits. Tulsa and Fairbanks are not required to have an EMS because these operations are not considered facilities as defined by EO 13148; their activities are limited to desktop operations that do not impact environmental programs.



The Morgantown and Pittsburgh sites were recertified as a single entity in 2006 by NSF-International Strategic Registrations, Inc. A transfer audit was conducted in June 2007, to transfer the ISO 14001 certification to Orion Registrars, Inc. In addition, Albany was also recertified by Orion Registrar, Inc. In order to maintain certification, surveillance audits are conducted every six months at Morgantown and Pittsburgh, and every 12 months at Albany. These audits 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 it is committed to responsible environmental stewardship.

Of significance in 2007 was the certification of the Pittsburgh and Morgantown sites to the Occupational Health and Safety Assessment Series (OHSAS) 18001. OHSAS 18001 is similar to ISO 14001, but it applies to safety and health management systems and was the next logical step in the continual improvement of NETL's ES&H Management System.

NETL's EMS at the Morgantown and Pittsburgh sites assures consideration of environmental impacts of day-to-day activities and minimizes these impacts, as much as possible, consistent with the mission of fossil energy research and development (R&D). The 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 continual improvement activities.

The scope of the EMS for the Albany site covers all activities onsite. Information about customer and stakeholder needs are translated into requirements for Albany's research, ensuring that resources and controls for performing research are in place, that the highest quality goods and services are delivered, and that delivered products

are provided using processes in the EMS. The EMS also addresses the requirements of controlling the impact of Albany's operations on the environment, the health and safety of employees, and the local community.

The scope of the EMS for the Pittsburgh and Morgantown sites covers onsite operations involving 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 operation.

The underlying framework of the EMS is the DOE 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. The EMS uses the same philosophy to protect the environment, both onsite and offsite, during the conduct of operations over which NETL has control.

### 3.2 ES&H Policy

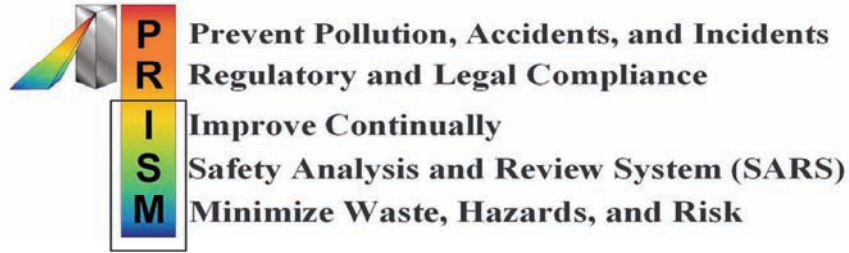
Senior management created an ES&H policy which is the basis for the NETL ES&H program. NETL strives to reduce injuries to the workforce and to minimize hazards to the public and the environment. NETL requires consideration of potential environment, safety, and health impacts when planning and executing work at all levels. The original policy was updated and approved by senior management in 2005 to align with the 2004 version of the ISO 14001 standard. It was updated again in 2006 to include the Albany site and incorporate safety and health concerns. The policy has not been changed since August 9, 2006.

Management commitment and employee involvement are required to maximize oversight and improve communications. 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.

The Albany site created its integrated management system prior to being incorporated into NETL in FY 2005. The management system is a single system which meets the requirements of safety, the environment, or any other system requested by its stakeholders. The result is a system that meets these requirements as part of normal conduct of operations, rather than simply adding tasks. As Albany work processes are merged with NETL work processes the management system will disappear as a separate management system. The eventual result will be unified NETL EMS.

NETL uses the acronym PRISM to illustrate its policy (see Figure 3.2). PRISM also shows the successful incorporation of Integrated Safety Management (ISM) into the EMS. The PRISM graphic is displayed widely at the sites and is given to each

employee in badge form as a reminder to employees and visitors of the policy. The PRISM logo was updated in 2006 to include safety and health, as well as to support the OHSAS 18001 certification.



**Figure 3.2 Illustration of NETL Environmental Policy**

### 3.3 Identification of Environmental Aspects and Impacts

Environmental aspects are impacts over which NETL has control or influence. All 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 is used to inventory and score each project, operation, and facility. The scores are reviewed by the EMS Crosscutting Team, a group of ES&H professionals and administrators consisting of both DOE and contractor staff, to determine the most significant aspects of NETL activities. The team then recommends to the EMS representative which aspects should be considered significant, and the representative approves the list of significant environmental aspects. The relative ranking of aspects is updated annually by the EMS Crosscutting Team, and the Registry of Significant Environmental Aspects is published.

The 2007 registry (see [Table 3.3](#)) provides a listing of the significant environmental aspects. In 2007, the aspects included environmental, safety, and health aspects since Morgantown and Pittsburgh sites were certified to the OHSAS 18001 standard.

Aspects at the Albany site are updated on an on-going basis, rather than annually. When there are changes noted in the nature or amount of any given activity, the significance of the environmental aspects associated with that activity is reevaluated. This increases the responsiveness and flexibility of the system, enabling more rapid adjustments in controls and resources as appropriate.

### 3.4 Environmental Objectives and Targets

Following an annual update and ranking of the significant environmental aspects, the environmental objectives and targets are revised for the following year. These revised objectives and targets are then presented to the Management Review Team for approval.

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

The EMS representative assigns responsibility for the objectives and targets to various individuals with expertise in the respective subject area. These individuals develop environmental management plans (EMPs) that specify how NETL will meet the objectives. As with the aspects, the objective and targets for 2007 included safety and health objectives and targets as well. The approved objectives and targets, as well as the actual performance data, for the 2007 aspects are presented in [Table 3.4.1](#) for Morgantown, Pittsburgh. (Aspects 8 and 9 of Table 3.4.1 also include Albany).

Albany has also developed the EMPs for its objectives and targets. These include the Alternative Fuels for Lift Trucks Program; the Beryllium Identification and Remediation Program; the Energy Efficiency Program; the Lead-Based Paint Abatement Program; the Groundwater Program; and the Particulate Emissions Reduction Program. The approved objectives and targets, as well as the actual performance data, for the 2007 aspects for Albany are presented in [Table 3.4.2](#).

### 3.5 Environmental, Safety, and Health Planning and Analysis Procedures

NETL takes a tandem approach to planning and managing its activities in an effort to minimize environmental, safety, and health 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 ES&H programs. Other activities that represent a concentrated effort are managed through environmental management plans as described in [section 3.4](#).

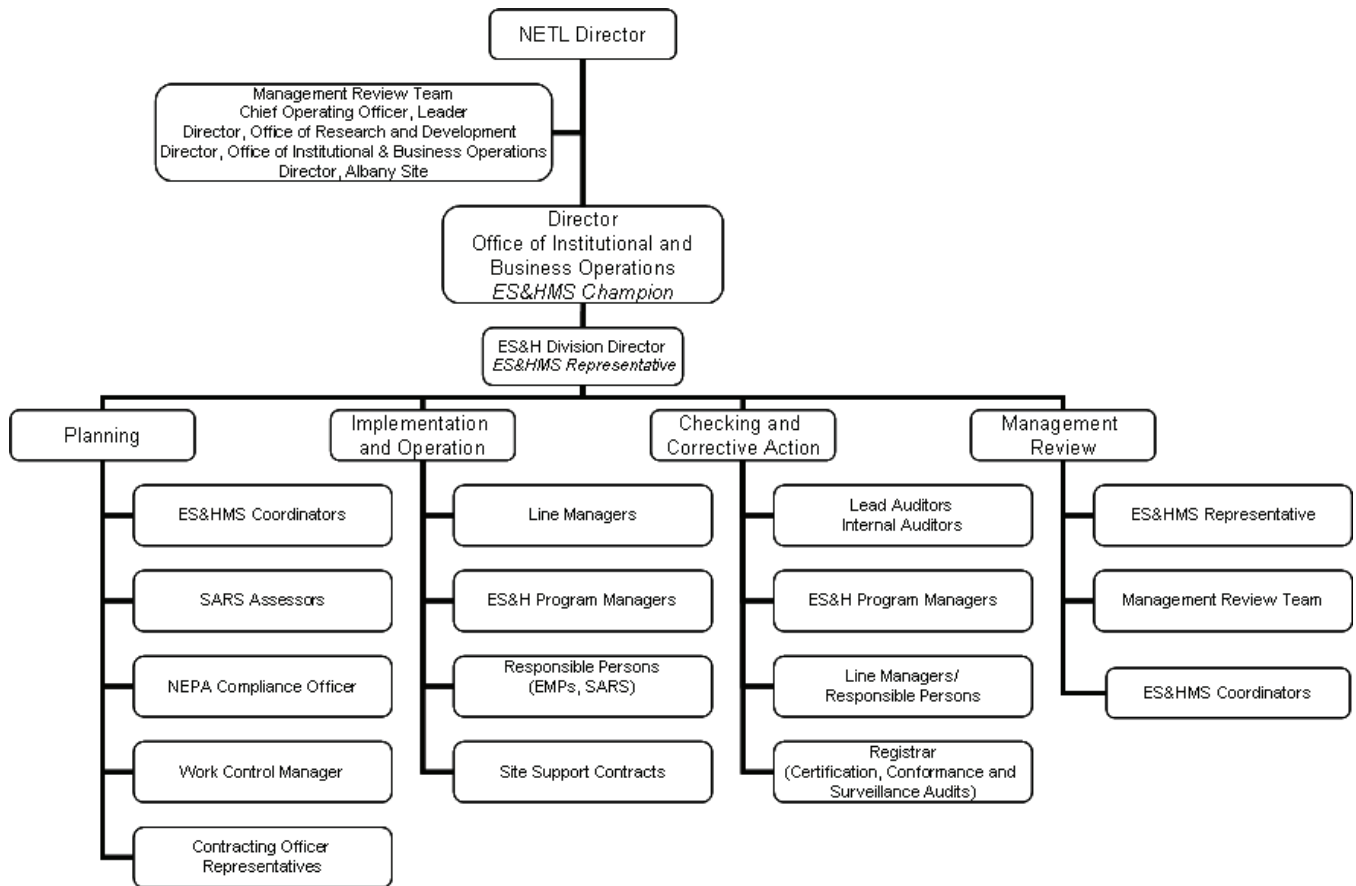
ES&H Directives. Most activities that can impact the environment are routine and occur repeatedly during ongoing operations. Because these activities are not one-time events, they are best managed through programs that are documented in directives (orders, operating plans, and procedures). These documents are written to describe how routine actions are undertaken to achieve the safety and environmental goals of NETL. Managerial responsibilities are attached to EMS/ES&H function titles. NETL directives are used to establish the foundation and control mechanisms of the EMS. The directives process is described in NETL Procedure 251.1-1, Directives Management System.

Environmental Management Plans (EMPs). Some activities that can impact the environment can be addressed through a concentrated effort that directly affect objectives and targets associated with the significant aspects. The specifics of the process and elements of an EMP are explained in NETL Procedure 450.1-6,

Environmental Aspects, Objectives, Targets, Management Plans, and Management Review. Each EMP specifies the nature of the action to be taken, the timeframe for the action, the responsible person(s) for the action, quantifiable targets, and how performance should be measured against the targets. Quarterly status reports are collected for EMPs to show progress on the activities documented in the plans.

### 3.6 Implementation and Operational Controls

The EMS is implemented through an organizational structure shown in [Figure 3.6.1](#). Senior level positions include the director, who serves as the ultimate authority for the EMS; the chief operating officer, who has authority for all on-site operations, including in-house R&D and administrative support and crosscutting functions, and is a lead member on the Management Review Team; the director of the Office of Institutional and Business Operations, who is the environmental steward and champion; and the division director for ES&H, who functions as the program administrator and the EMS representative. Mid-level titles and responsibilities are defined in several NETL directives that specify key components of the EMS. The ES&H division director assigns employees to the function titles and responsibilities.



[Figure 3.6.1. – NETL EMS Organization](#)

Albany continues to implement NETL procedures and directives wherever possible. This includes aligning Albany with NETL procedures for safety, industrial hygiene,

hazardous material handling, and waste disposal. Extensive internal communication is necessary to successfully implement any program. The NETL system of line management responsibility requires that line managers communicate effectively with the people working for them. Line managers are the primary means that NETL uses for achieving operational control.

EMS communication also occurs through the NETL Intranet, which is 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 about the NETL EMS.

Another example of internal communication at NETL is the biweekly regulatory review, which promotes awareness of regulatory changes and new programs. Every two or three 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 posted on the NETL Intranet homepage.

NETL communicates the EMS to its employees through the Intranet, training, staff meetings, e-mail, and posters. The training program includes general EMS training designed to make employees aware of the EMS by providing them with information about the significant environmental aspects and the potential impacts of their work, employee roles and responsibilities, and the potential consequences of a departure from operating procedures. In addition to the general training, program- and job-specific training is required for all staff based on their job duties. The computer-based training (CBT) system includes a job hazard survey that asks the user about their work assignments to obtain information about which training modules or types of training are needed. Job-specific training for an employee can also be requested directly by the employee or by his/her supervisor. Each employee and his/her supervisor are responsible for ensuring that all required training is complete before beginning work on an assignment.

For purposes of communication with external parties, NETL maintains an internet site, [www.netl.doe.gov](http://www.netl.doe.gov) that has EMS information available to the public, such as the ES&H policy and the significant aspects.

NETL conducts public participation activities under the requirements of the National Environmental Policy Act (NEPA). For projects conducted offsite, NETL is required by law to use the NEPA process to identify potential environmental impacts, consider alternatives, invite public comment or participation, plan the project with due regard for the environment, impose mitigation requirements, and make informed decisions about whether to proceed with the proposed project. The NEPA process provides a system for reviewing actions prior to a major expenditure of funds to

ensure the environmental and social impacts have been identified, analyzed, and will be mitigated to the extent practicable prior to committing to the project.

To effectively and efficiently implement the EMS, NETL has to maintain operational control of its onsite R&D projects, facilities, and operations. At Albany, Morgantown, and Pittsburgh, this is accomplished through the Safety Analysis and Review System (SARS). This system requires proposed projects to be described in writing and subjected to ES&H and quality reviews by various subject matter experts and technical committees. Approval must be granted before a project, operation, or facility can proceed beyond the planning stage. Included within this process is a review of the potential environmental impacts, regulatory requirements, safety and health hazards, and monitoring plans. After a project begins, annual reviews are required to make sure the project remains 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 include the following:

- Environmental Programs. Baseline programs have been established for both defined media (air, surface water, and groundwater) and likely pollution routes (spills, hazardous waste, non-hazardous waste). Generally speaking, each program is described in an operating plan/procedure and is managed by a corresponding ES&H program manager.
- Emergency Response System. NETL maintains processes to respond to accidents and emergency situations and for preventing or mitigating any environmental impacts that may occur. The Emergency Response Organization (ERO) conducts emergency response exercises annually and participates in emergency preparedness training. This year's scenario for the Morgantown site involved an NETL site technician and off-site contractor who became incapacitated while operating a crane located in a high bay area due to carbon monoxide exposure from project activities. Extrication of the two victims was accomplished through a high-angle rescue conducted jointly by the NETL Hazmat/Rescue Team and the Morgantown Fire Department. Monongalia Emergency Medical Service provided initial medical treatment and transport of the two victims to Ruby Memorial Hospital.

For the Pittsburgh scenario, a mail room employee picked up the NETL mail at the South Park (PA) post office and delivered it by van to Building 902. A warehouse employee identified several suspicious characteristics on a piece of mail. The employee called the NETL emergency number and reported the suspect mail. An entry team donned Level B PPE, placed the suspect mail in a portable glove box, transported the glove box to a nearby building B-900A, and opened the envelope with a razor knife. A white powdery substance was found. The NETL ERO Scene Emergency Response Team and Management Emergency Response Team were activated and security alerted the South Park Police, the Broughton Volunteer Fire Department (BVFD), and the NETL fire safety officer



of the situation. The BVFD incident commander subsequently activated the Allegheny County Hazardous Material Team and the U.S. Postal Inspector's Office. The NETL public information officer directed a joint information center be established at an off-site location. The Allegheny County Hazmat Team made entry into B-900A to field test the white powder and a positive identification for an organic biological agent was determined. The hazardous substance was transported by the hazmat team to a field laboratory. Buildings 902 and 900A were isolated until a reentry/recovery plan was developed.



- Contract Requirements. Work performed by contractors is controlled at the NETL sites through procedures that define the ES&H requirements for such work on NETL property, as well as for NETL-funded work at offsite locations.
- Affirmative Procurement Program. A program has been established to require that certain procurements contain 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 also periodically reviewed and revised. It is ensured that the current versions are readily available, and obsolete documents are promptly disposed of.

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

### 3.7 Self-Assessment Procedures and Corrective Action

NETL uses self-assessment procedures to improve ES&H performance through identification of non-conformances and tracking of corrective and preventive actions. Responsibility and authority for handling and investigating non-conformances and for initiating and completing corrective and preventive actions has been clearly defined by NETL as part of its processes. Several practices are employed, including internal audits, reviews, and inspections; independent assessments; and reporting through the Assessment Information Input System (AIIS) for the Morgantown and Pittsburgh

sites. Albany uses the commercially available program, TrackWise<sup>®</sup>, for tracking findings and corrective actions.

NETL conducts both internal and external audits of its EMS as required by the ISO 14001 standard. This process is defined in NETL Procedure 450.4-14, EMS Auditing. To maintain the ISO 14001 certification, an annual schedule is prepared that ensures that the entire standard is audited against NETL's EMS. There were four EMS audits performed in 2007, including one transfer audit by the ISO registrar, one surveillance audit, and two internal audits.

Management's commitment to ES&H is evidenced by encouragement and management review of ES&H inspections. DOE and contractor ES&H specialists participate in regular site audits and inspections, which cover all NETL facilities on an annual basis. These audits and inspections focus on ES&H observable conditions of facilities (e.g., compliance with OSHA regulations, National Fire Protection Association (NFPA) codes, the National Electric Code (NEC)), and other environmental requirements). Findings are entered into the NETL corrective action tracking systems, and the status of corrective actions resulting from the audits and inspections is provided semiannually to the management review team.

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

Program reviews are conducted every three years by the responsible program managers for each major environmental program (e.g., the Water Quality Program, the Air Quality Program, and the Groundwater Program). These reviews are informal and may vary in scope and detail. During each review, managers attempt to verify that the requirements stated in the procedure are still relevant and are actually being



met. When discrepancies are found, the program manager must decide whether to remove a specific requirement from the directive or to enforce the requirement. Some programmatic reviews occur more frequently or focus on monitoring results. These reviews look for trends, with the goal of identifying correctable problems and promptly taking action.

Site support contractor employees inspect various high-risk items periodically, document their findings, and provide the results to program managers. For example, daily inspections are performed at the hazardous waste facility, at selected potential

spill sources, and at storm water outfalls. Weekly inspections are made at industrial wastewater discharge points. Quarterly discharge monitoring reports are compiled and reviewed to determine if permit limits have been exceeded. Likewise, semiannual surface water monitoring reports are compiled and reviewed. All of this information provides the program managers with an opportunity to assess the effectiveness of their programs.

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

- A biweekly 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 the DOE Office of Health, Safety and Security (HS-1).
- Private sector publications are received by program managers, such as “Environmental Compliance in West Virginia,” a quarterly regulatory update bulletin published by Business and Legal Reports, Inc.; environmental compliance updates on CD ROM, published by the Bureau of National Affairs; and various trade journals.
- Program managers also draw on the Pennsylvania Bulletin and the Pennsylvania Code, which are produced by the Commonwealth of Pennsylvania, and the Code of Federal Regulations, published by the National Archives.
- The NETL library subscribes to relevant regulatory documents.
- Program managers purchase updated lists of hazardous or regulated chemicals as needed.
- All environmental program managers periodically check the websites of regulatory agencies, such as the West Virginia Department of Environmental Protection (WVDEP), the Pennsylvania Department of Environmental Protection (PADEP), and the Oregon Department of Environmental Quality (ODEQ).
- Albany uses a regulatory review service, RegScan™, to provide for regular review of federal and Oregon state regulatory changes to ensure continued compliance with regulatory requirements.
- To develop general awareness of new areas of responsibility, program managers may take training classes on relevant statutes and regulations.

Ultimately, NETL relies on the professionalism and personal responsibility of the program managers, who are subject matter experts residing in the ES&H Division, to

do whatever is necessary for them to stay abreast of the changing laws and regulations. It is part of the program manager's general job responsibilities to stay abreast of regulatory issues that may affect the NETL EMS and to take appropriate actions to implement these requirements.

- Independent Program Assessments. In addition to internal audits, NETL conducts independent assessments of its ES&H programs through an external contractor. These assessments identify strengths, weaknesses, deficiencies, and recommendations for improvement. They also provide a look at regulatory compliance and assure that non-compliances are discovered and corrected. The contractor reviews internally- and externally-generated documents associated with the programs and interviews program managers and other 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 2007 were the Support Operations Safety Analysis and Review System, the Asbestos Control and Abatement Program, and the Groundwater Quality Management Program. The assessments found that these programs were working well and provided NETL with a few recommendations for improvement.
- Workplace Monitoring Program. In general, the systems in place with regard to the workplace monitoring program are effective and contribute to the protection of workers and the environment. The system is effective in identifying workplace hazards and screening employees for the potential of exposure to those hazards. Line managers and support staff work cooperatively to reduce or eliminate exposures to employees.

It has not been necessary to conduct frequent industrial hygiene monitoring at NETL, since engineering controls reduce personnel exposures to minimal levels. Monitoring of most activities is largely driven by the SARS process, which establishes routines for safely operating facilities or research projects, inclusive of workplace monitoring.

- Facility SARS Program. In general, the systems in place with regard to the Facility SARS Program are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities; the applicable regulations; and best practices related to structural engineering, mechanical engineering, and construction safety.



The Facility SARS Program is used to determine the safety requirements for the design and construction of new and modified facilities. Certain selected renovation projects are done under a use permit, rather than the Facility SARS Program to reduce the administrative burden when a full SARS package would be unnecessary. The determination of whether to obtain a use permit or prepare a SARS package is made by the Office of Institutional and Business Operations director after reviewing information provided by the responsible person (RP) or facility custodian (FC), and is based on experience and professional judgment.

Upon completion of a construction project, the facility is inspected by a team of ES&H personnel, who recommend any necessary remedies or approve the use permit. After the facility is approved for use, the inspection schedule reverts to an annual review by the ES&H staff to determine if required safety measures are still in place and operational controls are being followed. Deficiencies found during the annual inspection are documented in the corrective action tracking systems (AIIS or TrackWise<sup>®</sup>).

- Industrial Wastewater Program. The systems in place with regard to the industrial wastewater program are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, applicable regulations, and best practices related to management of chemical hazards, including management and disposal of hazardous materials. Additional training is provided when needed for exceptional circumstances.

Nonconformance generated from all of the self-assessment audits mentioned above are documented using the corrective action tracking systems. Corrective action status is measured by data provided by AIIS or TrackWise<sup>®</sup>. All NETL employees have access to either AIIS or TrackWise<sup>®</sup>. Instructions on the use of the systems have been communicated to everyone.

At Pittsburgh and Morgantown, NETL Procedure 450.4-4, ES&H Corrective and Preventive Action Process, outlines how corrective and preventive action items identified in the various assessments performed at NETL are captured, prioritized,

assigned, tracked, closed, analyzed for root causes, and incorporated, as appropriate, into the lessons learned and training systems. This process holds responsible persons and line management accountable for timely closure of corrective actions implemented within their programs, organizations, or facilities and disseminates lessons learned across appropriate organizational elements at NETL.

In brief, after completion of an assessment, the lead assessor at Pittsburgh and Morgantown uses the AIIS database to generate an assessment record, which is identified by a unique number. Albany utilizes TrackWise<sup>®</sup>, for recording corrective and preventive actions. Individual findings and concerns that require corrective action are entered into AIIS or TrackWise<sup>®</sup> to ensure they are tracked to completion.

When a finding or concern is entered into the system, a unique number is assigned and cataloged in the database with the associated assessment record. A notification of the finding is sent electronically to the responsible person and line manager. All actions taken regarding the finding are then documented in AIIS or TrackWise<sup>®</sup>. To ensure that the findings have been fully addressed, follow up is done through the internal auditing process at Morgantown and Pittsburgh. At Albany, verification and validation are performed when the work is reported as completed.

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

Of note in 2007 is that NETL is working to develop a new corrective action tracking system to replace AIIS at the Morgantown and Pittsburgh sites and TrackWise<sup>®</sup> at the Albany site. The new system will be used by all of NETL and will incorporate a host of improvements based on user feedback. Several commercial and in-house systems have been reviewed and it is hoped that a new system will be tested in 2008.

### 3.8 Quality Assurance

Please see [Section 4.13](#) for a description of the NETL Quality Assurance (QA) Program, including QA for the EMS and AMS.

### 3.9 Management Review Process

Management review of the EMS ensures that the policy and system remain appropriate and effective. The EMS representative conducts semi-annual review meetings with the Management Review Team (MRT) (see [Figure 3.6.1, NETL EMS Organization](#)). During the review meetings, the MRT considers the environment, safety and health policy, objectives, targets, internal and external audits, and other related issues. Changes are documented and implemented. Management

involvement guarantees that the projects are funded and the appropriate priority is placed on the issues identified. Notes from the MRT meetings are posted to the intranet.

The MRT met two times during 2007, on February 28, 2007 and on September 13, 2007. Among the issues discussed were the selection of a new ISO 14001/OHSAS 18001 registrar, results of internal audits performed during the year, ES&H regulatory assessments performed by an independent third party assessor, status of corrective/preventive actions, follow-ups from previous management reviews, changing circumstances, significant aspects and hazards, recommendations for improvement, and the 2007 objectives and targets. The MRT also considered the option to upgrade the AIIS, and action was taken to review options for replacing the system.

## 4 COMPLIANCE SUMMARY

### 4.1 Major Environmental Statutes

NETL was in full compliance with all environmental statutes and regulations in 2007. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those statutes included CERCLA, SARA, RCRA, CAA, CWA, AEA, NEPA, and TSCA, and each are described in detail below.

### 4.2 Environmental Executive Orders

NETL was in full compliance with all applicable environmental executive orders in 2007. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those executive orders which apply to NETL include *Strengthening Federal Environmental, Energy, and Transportation Management*, which is described more fully in [Section 4.6.1](#). Other executive orders which apply to NETL but for which no specific action was required in 2007 included: [EO 11514](#) *Protection and Enhancement of Environmental Quality*; [EO 11738](#), *Providing For Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contracts, Grants, or Loans*; [EO 11987](#) *Exotic Organisms*; [EO 12088](#) *Federal Compliance with Pollution Control Standards*; [EO 11988](#) *Floodplain Management*; and [EO 11990](#) *Protection of Wetlands*.

### 4.3 DOE Internal Environmental and Radiation Protection Orders

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

residual background naturally occurring radioactive material (NORM) at the Albany site. Albany, Morgantown, and Pittsburgh also administer a limited number of sealed sources in full compliance with DOE Internal Radiation Protection Order 5400.5, as discussed below.

#### 4.4 Atomic Energy Act of 1954

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

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



Morgantown and Pittsburgh sites use research instruments that contain sealed radiation sources. These are small quantity emitters used to make various types of measurements. Albany uses research instruments that are considered radiation-generating equipment, but Albany does not have any sealed radiation sources. The Morgantown site also has four phosphorescent exit signs located in the hazardous waste accumulation facility.

Radiation safety officers maintain an inventory of these radiation sources, tracking each item, isotope(s), quantity, custodian, location, status, and activity. [Table 4.4.a](#) lists the 2007 source inventory at Morgantown, [Table 4.4.b](#) lists the 2007 radioactive sealed-source inventory for Pittsburgh, [Table 4.4.c](#) lists the 2007 X-ray radiation generating devices for Pittsburgh, and [Table 10.4](#) lists the x-ray radiation generating devices at Albany.

In 2007, the Morgantown and Pittsburgh sites did not release any of the radiation source materials into the environment. All of the source materials are sealed from escape or discharge. No radiation source materials were sent to off-site storage or disposal facilities. The Albany site has legacy radiological issues, which includes the presence of ores that are naturally-occurring radioactive materials.

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



#### 4.5 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (42 U.S.C. 4321 et seq., 1969) establishes federal policy for protecting the quality of the environment. The act establishes three levels of review for federal actions: environmental impact statements (EIS), environmental assessments (EA), and categorical exclusions (CX). Under the highest level of review, an EIS is prepared to evaluate the environmental consequences of any major federal action that might have significant impact on the quality of the environment. The EIS must include a comparative analysis of those realistically available alternatives that would accomplish the same goals that the federal action is expected to address. Based on the EIS, a record of decision is prepared to document which alternative will be pursued.

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

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

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

The following EIS activities took place in 2007:

##### **FutureGen**

The FutureGen Research Initiative aimed to create the world's first coal-based, near-zero emissions electricity and hydrogen production power plant. The 275-megawatt FutureGen plant would have employed advanced coal gasification technology integrated with combined-cycle electricity generation, hydrogen production, and capture and sequestration of carbon dioxide. For this project, NETL developed a draft EIS and issued the draft for public review on June 1, 2007, starting a 45-day public comment period. A public hearing was held at each of the four alternative sites (Jewett,



Texas; Mattoon, Illinois; Odessa, Texas; and Tuscola, Illinois). DOE responded to public comments in the final EIS, which was issued to the public on November 16, 2007. Since this date, the NEPA process on this project has been put on hold indefinitely, and the project is currently undergoing restructuring by DOE.

### **Western Greenbrier Co-Generation Demonstration Project**

The final EIS for the Western Greenbrier Co-Generation Project was approved on October 19, 2007. This project is a first-of-a-kind, state-of-the-art power plant fueled primarily from nearby waste coal, or gob. The final EIS was distributed to members of Congress, governmental agencies, and the public on October 31, 2007. The Notice of Availability was published in the Federal Register on November 9, 2007. The Record of Decision, anticipated to be signed in April 2008, will represent a major milestone for this NETL-managed Clean Coal Power Initiative project that is to be designed, constructed, and operated by Western Greenbrier Co-Generation, LLC, a nonprofit organization owned by the municipalities of Rainelle, Rupert, and Quinwood, WV.

### **Orlando Gasification Project**

Southern Company Services, Inc. was selected under Round 2 of the Clean Coal Power Initiative to demonstrate a coal-based transport gasifier which has a fuel-flexible design projected to have higher efficiency and lower capital and operating costs than currently available oxygen-blown entrained-flow gasifiers. The final EIS Notice of Availability was published in the Federal Register on January 26, 2007, and the Record of Decision was published in the Federal Register on April 6, 2007. However, on November 14, 2007, the host utility for the project (Orlando Utilities Commission) announced in conjunction with Southern Power Company that they were terminating construction of the gasifier portion of the project, due to the impact of possible federal and state regulations related to future emissions restrictions in Florida.

### **Mesaba Energy Project**

Excelsior Energy was selected under Round 2 of the Clean Coal Power Initiative to build the Mesaba Energy Project near Hoyt Lakes in the Iron Range of Northeastern Minnesota. The objective is to design, construct, and demonstrate a utility-scale next-generation integrated gasification combined cycle (IGCC) electric power generating facility which uses the ConocoPhillips E-Gas™ carbonaceous solids gasification technology. The planned installed capacity is approximately 600 MWe (net). The draft EIS (DOE/EIS-0382D) Notice of Availability was published in the [Federal Register](#) on November 8, 2007, and public hearings were held on November 27-28, 2007, in northeastern Minnesota. The final EIS is in preparation.

### **Gilberton Coal-to-Clean Fuels and Power Project**

WMPI PTY, LLC was selected to design, construct, and operate an integrated coal waste gasification technology and Fischer-Tropsch technology facility in Gilberton, Schuylkill County, Pennsylvania. This demonstration effort will involve using a

feedstock of 4,700 tons per day of anthracite coal waste to produce approximately 5,000 barrels per day of clean liquid fuels (diesel fuel and naphtha) and about 41 megawatts of electricity. A draft EIS (DOE/EIS-0357) was issued in November 2005, and after receiving comments, particularly with regard to carbon dioxide (CO<sub>2</sub>) emissions and CO<sub>2</sub>-related cumulative impacts, a supplement to the draft was issued in late December 2006. Comments on the supplement were received through February 2007. Both oral and written comments on the draft EIS and comments on the supplement were considering in preparing the final EIS. In addition, to complete the final EIS, an appendix was developed comparing the potential impacts of using petroleum coke and anthracite coal as feedstock. The final EIS was issued in October 2007. The Record of Decision has not been finalized.

#### 4.6 Executive Order 13423 -- Strengthening Federal Environmental, Energy, and Transportation Management

President Bush signed [Executive Order 13423](#) *Strengthening Federal Environmental, Energy, and Transportation Management* on January 24, 2007.

This new order revoked several previous energy, environmental and transportation executive orders, including EO 13101, EO 13123, EO 13134, EO 13148, and EO 13149.

The many changes brought about by EO 13423 include further definition and required goals for energy intensity, renewable energy, and transportation management. In addition, EO 13423 mandates sweeping changes to the NETL energy management program. To implement this executive order, NETL is

aggressively providing the most energy efficient management of facilities possible. For example, lighting retrofits are now a routine part of all construction/renovation packages. Inefficient lighting fixtures are routinely replaced with more efficient 277-volt Energy Star-rated electronic ballast fluorescent fixtures. Motion sensors have been installed to conserve energy in areas that do not have frequent use. NETL consistently incorporates energy efficient designs, Energy Star rated equipment, and Federal Energy Management Program (FEMP)-approved equipment into construction packages, renovation packages, and maintenance projects.

EO 13423 redefines Public Law 109-58, which is the Energy Policy Act of 2005 (EPact05) that had established new and updated performance objectives for the federal government. Those updated performance objectives require a reduction in energy intensity (energy consumption per square foot of building space) of 3%



per year from 2006 through 2015, based on a 2003 baseline. This will result in an overall 30% reduction in energy intensity (energy use/gross square feet) by 2016. The EPact05 requirements reestablished by EO 13423 include the following electricity procurement requirements: from 2006 through 2009, at least 3% of NETL's total electricity supply must be derived from renewable energy; from 2010 through 2012 at least 5% of the total electricity supply must be derived from renewable energy; and from 2013 and beyond at least 7.5% of the electricity must be derived from renewable energy. EO 13423 also requires that 50% of the above mentioned renewable energy is generated from renewable energy sources that were developed after 1990.

EO 13423 requires a reduction of water consumption intensity (water use per square foot of building space) through life-cycle cost-effective measures. This reduction must be at least 2% per year from 2008 through 2015, or 16% by the end of FY2015 using FY2007 as the baseline. EO 13423 requires that new DOE building design, construction, and major renovations comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006)* and that 15% of the existing federal capital asset building inventory of NETL at the end of FY2015 incorporate the sustainable practices established in these guiding principles.

During FY2007 NETL has initiated various aggressive actions to meet or exceed each of these goals by procuring energy efficient products; utilizing energy saving performance contracts; and by updating design, construction, renovation and maintenance packages/procedures by incorporating new federal building design and performance standards, by procuring renewable energy, and by implementing innovative energy management technologies and water conservation measures.

In January 2007, the DOE began updating Order 430.2a, *Departmental Energy and Utility Management*, to make it consistent with the implementation requirements of EPact05 and EO 13423. As a result of this effort a new DOE Order 430.2b, *Departmental Energy, Renewable Energy and Transportation Management*, is expected to be issued in early 2008 to reflect these new performance objectives. NETL was directed to follow the current active DOE Order 430.2a while meeting or exceeding EPact05 and EO 13423 objectives and goals until the new order is approved for release.

NETL's Comprehensive Energy Management Plan was updated in 2007 to include strategies and annual implementation steps to insure compliance consistent with EO 13423 and EPact05. The plan includes requirements consistent with the new DOE O 430.2b, as well as an energy curtailment plan for use during an emergency.

NETL undertakes life-cycle cost analyses as a part of every decision to undertake new projects and investments. In 2007 these analyses were used for equipment

replacement projects, especially HVAC system replacements. These analyses will often help determine the optimal time to undertake a retrofit project during the life span of equipment or facilities. To further guide the decisions about priorities for energy efficiency improvements to the infrastructure, NETL, during fiscal year renovations, conducts specific construction project energy audits. Additionally, NETL's Ten-Year Plan includes energy efficiency upgrades and water conservation projects in its general plant project (GPP) budget requests.

NETL was able to achieve the EPact05 required 3% reduction in energy consumption per square foot of building use in FY2007 using FY2003 as the base year. Energy use at NETL was 231,732 BTU/gross square foot (energy intensity) in FY2003. Energy use was 152,939 BTU/gross square foot during FY2007, which equates to a 34% percent reduction. This exemplary reduction in energy intensity was achieved in part through the Pittsburgh site's procurement of 100% of its natural gas needs from a local landfill. This source of natural gas is provided through the natural gas utility supplier. The DOE Office of Federal Energy Management Program has identified landfill natural gas as a renewable energy source. The FY2008 through 2012 contribution from landfill gas use at Pittsburgh will help reduce NETL's energy intensity for both renewable energy sources and long-term renewable sources as identified in [Table 4.6.1](#).

EPact05 and EO 13423 do not define a goal for greenhouse gas reduction and, therefore, the goal established in EO 13123 is generally applicable for greenhouse gas reduction. EO 13123 had established a goal of 30% reduction by 2010 using FY 1990 as the base year. EO 13123 defined greenhouse gas as CO<sub>2</sub> only. NETL received authorization from the DOE Federal Energy Management Program to allow credit for reducing greenhouse gas through the use of landfill gas. This is permitted because landfill gas reduces methane emissions, which are considered to be more environmentally damaging than CO<sub>2</sub> emissions.

In FY 2007, NETL greenhouse gas emissions were 24,958,537 pounds of CO<sub>2</sub>. Using the 1990 baseline of 67,849,829 pounds of CO<sub>2</sub> yields a 63.21% reduction for 2007. The success in reducing greenhouse gas emissions has been achieved by a reduction in electricity, natural gas, and steam use combined with the credit for using landfill gas and the installation of new multi-stage central steam plant boilers at NETL's Morgantown site.



NETL has reduced consumption of petroleum products primarily through the use of ethanol and natural gas in alternative-fueled vehicles. DOE defines petroleum products as oil, gasoline, diesel fuel, liquefied petroleum gas (LPG), and propane.

NETL does not typically use petroleum products for heating buildings. Only forklifts, front-end loaders, snow-removal equipment, and lawn care equipment use petroleum products at NETL. This equipment is generally fueled using gasoline and diesel fuel. Alternate fuel systems have been installed at both Morgantown and Pittsburgh. These alternative fuel systems include a mixture of 85% ethanol-15% gasoline (E-85) and compressed natural gas (CNG) vehicle refueling stations. As of the end of FY2007, E-85 refueling stations are operating at both Morgantown and Pittsburgh. As of the end of FY2007, only the CNG facility at Pittsburgh was operating, while the Morgantown CNG facility remained under construction. The E-85 and CNG facilities are helping NETL meet the alternate-fueled vehicle goals as defined in EO 13223.

EO 13101 was revoked January 24, 2007, and replaced by EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. Section 2 of the new executive order re-established new goals for federal agencies that correspond to those originally established in EO 13101. These goals include:

- 1) acquisition of goods and services that use sustainable environmental practices, including acquisition of bio-based, environmentally preferable, energy-efficient, water-efficient, and recycled-content products,
- 2) use of paper with at least 30 percent post-consumer fiber content,
- 3) reducing the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed,
- 4) increasing diversion of solid waste as appropriate,
- 5) maintaining cost effective waste prevention and recycling programs,
- 6) meeting at least 95 percent of the requirements for an electronic product with an electronic product environmental assessment tool (EPEAT)-registered electronic product, unless there is no EPEAT standard for such product,
- 7) enabling the Energy Star feature on computers and monitors,
- 8) establishing and implementing policies to extend the useful life of electronic equipment, and
- 9) using environmentally sound practices with respect to disposition of electronic equipment that has reached the end of its useful life.

NETL has implemented an affirmative procurement program using an internal Procedure 541.2-1B, *Affirmative Procurement Program*. To help employees to

follow environmental requirements of affirmative procurement through credit card purchases, the program requires that all government credit card purchases be monitored for affirmative procurement compliance. Similarly, NETL tracks purchases that are made by the NETL warehouse for office supplies and materials. A training program has been developed to educate procurement officials and government credit card holders on the requirements of affirmative purchasing.

NETL provides a list of green products on its internal computer Intranet to inform employees considering a purchase to utilize environmentally friendly alternatives.



When a buyer needs an item, a check is first made to determine whether the items are available as a used or excess item. This is particularly helpful when obtaining office supplies, furnishings, tools, and chemicals. Buyers are encouraged

to make use of the used or excess items whenever possible. If the items are not available from the used or excess list, then the prospective buyer is encouraged to obtain the items from the warehouse, which stocks green items. Only when the item is not available on the used or excess list, and is not available in the warehouse, is the prospective buyer permitted to purchase the item from an outside source. In those situations, the small purchase system software, the Standard Accounting and Reporting System (STARS), requires buyers provide a justification on why they are required to purchase non-affirmatively.

In addition to the Affirmative Procurement Program, NETL has combined four existing purchasing requirements into an integrated program. The program includes energy-efficient, recycled-content, bio-based, and environmentally preferable products, in addition to requiring that office paper contain 30 percent post-consumer fiber. These purchases can include recycled content products designated in EPA's Comprehensive Procurement Guidelines, Energy Star® products, bio-based products designated by the U.S. Department of Agriculture, and environmentally preferable products and services, including EPEAT-registered electronic products.

In 2007, NETL met the target of 100% for green purchases of storeroom materials and supplies, including paper, construction materials, non-paper supplies, vehicular materials, transportation materials, landscaping materials, park and recreation supplies.

#### 4.7 Compliance and/or Cleanup Agreements

There were three ongoing compliance activities in the State of Wyoming and one close-out activity in Texas during 2007. Two sites required on-going active remediation activities, and one site has been cleaned-up and is subject only to vegetation surveillance monitoring. The two active sites have volatile and semi-volatile organic contaminants (VOCs) in the ground water. Organic contaminants of concern are primarily benzene, toluene, ethylbenzene, and isomeric xylene (BTEX) compounds. Underground coal gasification and oil shale retorting tests resulted in ground water contamination at the two active sites.

The largest cleanup activity during 2007 occurred at the Rock Springs Oil Shale Retort Project Site near Rock Springs, Wyoming. Air sparge/bioremediation activities were conducted at sites 4, 6, 7, 9, and 12. Sites 4, 6, and 12 are near the Wyoming Department of Environmental Quality (WDEQ) water quality standard of 5 parts per billion (ppb) of benzene. Site 9 has 5 monitor wells that exhibit higher levels of benzene (up to 40 ppb) and will require continued air sparge/bioremediation activities. Remediation activities continued at the Hoe Creek Underground Coal Gasification Project at the Hoe Creek III site.

Periodic air sparge/bioremediation actions were conducted, but shut-down periods of inactivity up to 6 months were conducted to allow evaluation of additional contaminants that leached into the ground water from source materials.



Three ground water monitor wells have contaminant levels above the WDEQ standard of 5 ppb (with a range of 9-40 ppb). Air sparge/bioremediation activities will continue until contaminant levels reach the required levels of 5 ppb.

The Rocky Mountain I Underground Coal Gasification Reclamation Project, near Hanna, Wyoming was completed, and all regulatory requirements were met. The WDEQ released the reclamation performance bond and terminated Permit No. R&D # 1. No further action is required.

Cleanup of the Air Products Gasification Facility D&D Project in LaPorte, Texas was completed and surplus equipment has been disposed of. The contract was routed through contract close out, and no further action is required.

#### 4.8 Environmental Violations Cited by Regulators

There were no environmental violations cited by regulators in 2007.



#### 4.9 Notices of Violation, Notices of Deficiency, Notices of Intent to Sue, and Other Enforcement Actions Issued

##### Groundwater

The Albany site began a groundwater monitoring program as a voluntary effort onsite in 2001 and offsite in March 2005. Certain VOCs at levels above the State of Oregon's risk-based standards both in the groundwater at the Albany site and beneath Liberty Elementary School located adjacent to the site were discovered at the times noted above. NETL continues to monitor the groundwater both onsite and offsite, perform applicable site investigations, document applicable risk assessments, and act as a voluntary participant in the Oregon Department of Environmental Quality's (DEQ) Cleanup Program. At no time have students, faculty, or staff of the elementary school received any adverse or harmful exposures. NETL works closely with the Oregon DEQ to investigate the nature and extent of the contamination, as well as to assess appropriate remediation methods. No enforcement action has been initiated by the DEQ against the DOE as of the end of 2007.

Current plans include the continued development of a site investigation report to document work efforts to date. Once the investigation is complete, subject to need and availability of funds, NETL will assess the results, conduct a phased risk assessment, and determine appropriate remedial actions. NETL will continue to cooperate with the Oregon DEQ in conducting these activities.

##### Beryllium

In 2005, beryllium surface contamination above the threshold limits for contamination specified in 10 CFR Part 850 was discovered in several buildings at the Albany site. In response, the Albany site, then known as the Albany Research Center (ARC), began a systematic process of identifying all beryllium-contaminated areas and evaluating the potential levels of residual beryllium throughout the site. ARC also implemented worker safety measures, including the provisions of 10 CFR Part 850 for establishing a Chronic Beryllium Disease Prevention Program.

In 2007, NETL completed testing the facility for the potential spread of beryllium and characterized the site by performing beryllium inventory sampling. Based on the data collected, NETL compiled a prioritized list of areas to remediate and issued a solicitation for the remediation work. It is anticipated that an award will be made and remediation of the affected areas will begin in FY2008.

#### 4.10 Reportable Occurrences

The Morgantown and Pittsburgh sites did not file any (0) environmental occurrence reports into the DOE Occurrence Reporting and Processing System (ORPS) in 2007. However, the Albany site filed two (2) safety- and health-related occurrence reports. One occurrence report was categorized as a near-miss incident involving an unstable mixture of methanol and nitric acid (FE--NETL-GOHQ-NETLALBANY-2007-0001). The second occurrence report was categorized as a failure to follow a

prescribed hazardous energy control process. Neither incident involved an OSHA recordable injury.

#### 4.11 Major Issues, Instances of Non-compliance, and Corrective Actions

There were no major issues, instances of non-compliance, or corrective actions at NETL in 2007. Concerns over potential groundwater contamination with VOCs and surface contamination of beryllium at the Albany site are discussed in [Section 4.9](#).

#### 4.12 Status of Ongoing Third-Party Inspections, Self-Assessments and/or Environmental Audits

NETL continued to maintain ISO 14001 certification at the Albany, Morgantown, and Pittsburgh sites in 2007 and successfully achieved third party OHSAS 18001 confirmation for the Morgantown and Pittsburgh sites. Morgantown and Pittsburgh completed an independent, third party, ISO 14001 transfer/certification audit on June 7-8, 2007, and a combined ISO 14001/OHSAS 18001 surveillance audit was completed on November 6-7, 2007. Two internal audits were performed during the year. Albany did not conduct an independent third party audit of the ISO 14001 certification in 2007.

The third party OHSAS conformance confirmation took place in four distinct steps established by the independent auditor. The first step involved a comprehensive document review audit March 16-20, 2007. The next step, designated the stage 1 OHSAS 18001 Audit, was performed March 26-27, 2007. This involved familiarization with the physical site layouts and assessment of risk priorities. The third step, designated the Stage 2 OHSAS 18001 Audit was performed April 30- May 2, 2007. It involved careful review of NETL's internal auditing program, NETL's corrective and preventative action program, NETL's ES&H training program, and NETL's confined space entry program.

The ISO 14001 transfer/certification audit conducted June 7-8, 2007, was necessary since NETL procured the services of a new auditor for its ISO 14001 certification. For reasons unrelated to auditor performance, NETL was required to solicit a new contract for the services of a third party auditor to perform independent auditing services. This resulted in the former auditor, NSF-ISR, being replaced by a new auditor, Orion Registrar, Inc. The transfer/certification audit was performed in part to ensure the orderly and seamless conversion to the new auditor. The transfer audit involved a review by the new auditor of issues identified by the former auditor, as well as areas previously not reviewed. The audit found that "there were no open nonconformances from the prior registrar, and none were documented at this audit."

The ISO 14001/OHSAS 18001 Surveillance Audit #1 was conducted on November 6-7, 2007, and involved the surveillance of NETL's ISO 14001 certification and the initial confirmation of OHSAS 18001 conformance. The audit resulted in two (2) minor nonconformances and three (3) opportunities for improvement. One minor

non-conformance addressed inconsistent requirements for personal protective equipment (PPE) found between requirements posted outside a work area and the requirements identified in directives. The other minor non-conformance involved two SARS packages that failed to include training records needed to demonstrate fulfillment of ES&H training requirements. The audit also revealed three (3) strengths in NETL's ISO 14001 and OHSAS 18001 programs.

#### 4.13 Summary of Environmental Permits

A summary of environmental permits for the Morgantown site is provided in [Table 4.11.a](#), and a summary of environmental permits for the Pittsburgh site is provided in [Table 4.11.b](#). The Albany-site maintains a wastewater discharge permit with the City of Albany.

#### 4.14 Emergency Preparedness

NETL won a 2007 Fossil Energy Environment, Safety, Security and Health Award for integrating the NETL emergency public information announcements with county joint information center processes. The award was based on NETL efforts in three (3) states to build a common process and standard by offering training to county public information officers, NETL emergency public information officers, and NETL senior management.

The Emergency Response Organization (ERO) conducts emergency response



exercises annually and participates in emergency preparedness training. In 2007, NETL conducted one emergency response exercise at the Morgantown site involving a chemical release and high angle technical rescue in cooperation with county response agencies. An exercise at the Pittsburgh site involved receipt of suspect mail and was conducted in cooperation with other federal agencies and the US Postal Service.

The NETL Continuity of Operations Plan was approved in 2007. The plan encompasses continuity and pandemic planning for all 5 NETL sites and takes into account essential support activities that NETL provides to DOE HQ and FE.

#### 4.15 Quality Assurance

NETL is responsible for a wide range of work activities, including basic and applied onsite research; contract administration for off-site research, development, and demonstration projects; design, construction, operation, modification, decommissioning, and environmental remediation of NETL facilities; and the

management and oversight functions related 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, ISM core functions, and DOE Order 414.1C, *Quality Assurance*. Line management accountability for ES&H issues is an integral part of the QA Program and ISM. NETL implements this through work performance goals for which all line managers are accountable. Internal assessments and audits also ensure that line managers are accountable for their ES&H responsibilities.

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

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

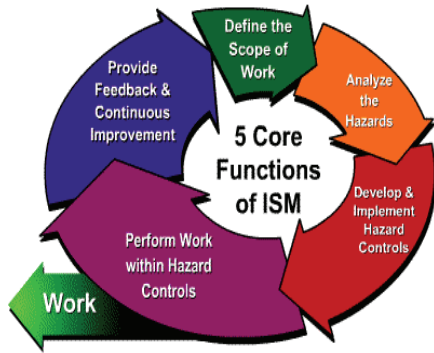
The SARS process is the backbone of NETL's QA Program for ES&H. Much of the needed data regarding hazards and environmental impacts are generated from this process; therefore, it is important that it work effectively. NETL has three distinct SARS processes: one each for R&D, facility, and support operations. At Morgantown and Pittsburgh, the R&D SARS procedure, NETL P 421.1-1, describes the process and procedural requirements for a safety analysis and review of onsite R&D projects. The purpose of this safety analysis and review is to ensure that risks associated with NETL's onsite R&D projects are analyzed, understood, and then eliminated, mitigated, or controlled to a degree acceptable by line management before work begins. All onsite R&D projects receive a SARS operating permit after successful completion of the SARS review. Albany uses a job hazard assessment (JHA) process and writes standard operating procedures (SOP) for all hazardous tasks on site and is in the process of adopting the NETL SARS procedure.

An annual review is conducted on all SARS-permitted R&D projects by a team made up of, at a minimum, the project's responsible person (or designee), an ES&H representative, a project quality assurance engineer (PQAE), and the site's environmental manager. The assessment includes: (1) checking for significant modifications made to the project without appropriate authorization and SARS review; (2) ES&H Division inspection of the project area covering chemical hygiene,

OSHA requirements, and environmental compliance; (3) review of the SARS files and the project area for engineering design and QA/quality control concerns; and (4) review of problems found in the project area or in the SARS file. Records from each annual assessment are added to the project's SARS file.

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

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



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

NETL's Support Operations SARS Procedure, NETL P 421.1-2, covers onsite support operations conducted by site support contractors, such as construction, operations, maintenance, and renovation activities for which they are responsible and ensures that associated risks are analyzed, understood, and then eliminated, mitigated, or controlled to a degree acceptable by responsible line management prior to initiation of the project or operation.

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

#### 4.16 Performance Measurement

Goal setting is an excellent approach to motivate and monitor performance. NETL's environmental performance and progress toward goals is tracked and reported to satisfy both internal and external requirements. Throughout 2007, trained ES&H professionals performed extensive crosscutting audits and inspections of the NETL ES&H program to ensure adequate performance. The performance measures used to monitor progress include *EMP Objectives and Targets* ([see Section 3.4](#)) and institutional environmental performance measures. This includes NETL's performance measures established under the Government Performance and Results Act (GPRA) of 1993. These measures are tracked on a fiscal year basis. They cover performance goals and accomplishments for FY 2007. In addition to these measures, surveillance monitoring is conducted through routine reviews and inspections. The type of performance monitoring conducted through this program is presented in [Table 4.14, Surveillance Monitoring](#).

## BEGIN SEPARATE SITE ANALYSIS

### 5 MORGANTOWN

#### 5.1 Site Description

The Morgantown site resides within Monongalia County, West Virginia, on the northern end of the city of Morgantown. This location is about 70 miles south of Pittsburgh, Pennsylvania, and about 200 miles west of Washington, DC.

Geographically, the facility sits within the rolling hills of the Appalachian Plateau, about 1,000 feet east of the Monongahela River and about 10 miles west of Chestnut Ridge, the westernmost ridge of the Allegheny Mountains. The Morgantown site covers approximately 132 acres, 46 acres of which are developed as industrial. Two small streams border the site on the east and northeast sides, and all surface drainage goes into these two streams. Immediately surrounding the Morgantown site, the land use is a combination of residential, commercial, deciduous forest land, and pasture.

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

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

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

## 5.2 Major Site Activities

The final stages of construction activities at the Technology Support Facility (TSF) at Morgantown were approached during 2007. Installation of structural steel, windows, stone façade, build-out of roof penthouse, and installation of the roofing system was



completed. When completed in 2008, the TSF will be a multi-story, 106,000-square foot structure and house approximately 168 offices. The TSF is designed and constructed to enable NETL to obtain U. S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Gold Certification. When completed, the facility is expected to be one of the most energy efficient and cost effective federal structures built to date. The

TSF is being designed and constructed to consume 43% less energy than a building designed and constructed using conventional methods and materials. The Department of Energy and NETL will realize utility and operational cost savings of approximately \$1.5 million dollars annually due to this design.

As-built drawings for the NETL electrical, internal and external plumbing, potable water, and fire water systems were prepared to scale for facilities in Morgantown and Pittsburgh. This was an important step in ensuring that information required for the Facility Information Management System (FIMS) conforms to the system standards that are required to be validated in FY2008.

**Facility Repairs Completed.** The decommissioning and removal of the existing inefficient 700 psi air compressor in Building 5 was completed. The compressor was replaced with a new high-efficiency multi-phase system. This was part of a site-wide compressor replacement project that is integrated into the building management system that utilizes remote sensing and control through a building energy monitoring program to ensure maximum energy efficiency. In addition, the HVAC ductwork in Building 16 was replaced following the identification of health and safety concerns over the condition of the system.

The roofs on Buildings 23, 25, 28 and 29 were replaced following concerns over the health and safety of building occupants. The new roofs were installed and provided with improved insulation and ultraviolet sunlight protection to ensure increased energy efficiency. A refurbished generator to supply an uninterrupted power supply (UPS) to NETL computational services was installed in an existing area of the computer center to minimize facility impacts.



## 6 COMPLIANCE STATUS

### 6.1 Environmental Restoration and Waste Management

#### 6.1.1 CERCLA

Morgantown had no National Priorities List (NPL) sites in 2007 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 West Virginia Hazardous Waste Site list (state equivalent of CERCLIS). There were no reportable releases in 2007. During the past 25 years, there have been several on-site cleanup activities. Some of these activities followed the closure of facilities that had leaked for a number of years. Other cleanup activities followed discrete spills. [Table 6.1.1](#) provides an overview of these events in terms of the sources, the contaminants, and the current status of the sources and contaminants at the site. A list of the specific chemicals or materials of concern is presented in [Table 6.1.2](#), *Properties of Potential Contaminants*.

#### 6.1.2 SARA Title III

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



To help comply with these regulatory requirements, NETL developed Procedure 440.1-2 (B), *Chemical Inventory and SARA Title III Reporting*, which is implemented by the NETL chemical hygiene officer. The program revolves around a computer-based chemical inventory system that is continually updated as materials are purchased, consumed, or disposed of. The database is verified

annually 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 determine if it is available on site. If not, they may obtain a purchase request for the chemical. The purchase request is reviewed by a specialist who assigns an MSDS number, if an MSDS is already on file. The specialist also attempts to determine if less hazardous substitutes are available. If the chemical is new to NETL, the Chemical Inventory and MSDS Manager (CIMM) will obtain a copy of the MSDS for review before it is approved to be purchased. Once the purchase request is approved, the purchase can be initiated. When chemicals arrive on site, tracking begins. First, the chemicals are tagged and logged into the database. When the chemicals are moved to a new location, the database must be updated with the new location of the materials. When the empty container is picked up or when the remaining material is sent to the hazardous waste facility for disposal, the item is removed from the database.

Morgantown did not have any extremely hazardous substances above threshold planning quantities (TPQ) in 2007. NETL provides Tier 2 chemical inventory reports to the Monongalia County Local Emergency Planning Committee and the Morgantown Fire Department as a courtesy to these organizations and to document the actual quantities that remained on-site. Hydrogen sulfide was above the TPQ in 2006, but was removed from Tier 2 reporting requirements in 2007 because the 370 pounds daily average (maximum daily 385 pounds) was below the 500-pound TPQ. Hydrogen sulfide is stored as a compressed gas in metal cylinders. Other materials that are voluntarily reported in the Tier 2 report are carbon dioxide (average daily amount stored is approximately 2,000 pounds) and nitrogen (average daily amount stored is approximately 55,000 pounds). Nitrogen is stored outdoors in an above-ground storage tank and in individual gas cylinders.

Morgantown did not generate a toxic release inventory (TRI) in 2007 because the site did not release any of the listed toxic materials in quantities that exceed the TRI threshold amounts. Similarly, there were no releases that would trigger either EPCRA or CERCLA emergency notification.

### 6.1.3 RCRA Program

The Resource Conservation and Recovery Act (RCRA) designates sites as generators, transporters, or transportation, storage and disposal (TSD) facilities. Morgantown is regulated as a large-quantity generator and is under the jurisdiction of the West Virginia Department of Environmental Protection (WVDEP). Although hazardous waste generation rates are low for most months, occasional lab activities result in the generation of larger quantities that exceed

the threshold for large quantity generators. [See Table 6.1.3](#) 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 2007, hazardous waste materials were transported to the storage and treatment facilities of American Environmental Services (AES), Inc., located in Westover, WV, a town adjacent to 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 wastes that are not recycled and cafeteria waste) is transported by Browning Ferris Industries (BFI), Inc., to the Meadowfill landfill, located near Clarksburg, WV.

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

NETL does not have an onsite program to treat hazardous waste or render them harmless; however, NETL does recycle some universal waste as classified under RCRA. During 2007, NETL recycled batteries, fluorescent light bulbs, and various items containing mercury.

Onsite hazardous waste handling is governed by NETL Procedure 450.1-9, *RCRA Hazardous Waste Management*. This



procedure requires laboratory workers to place their hazardous waste into labeled containers (drums, buckets, bottles) in their labs. An internal manifest is used for tracking and identification. Laboratories have satellite accumulation areas where the waste awaits transport by technicians to the onsite collection area located in B-33. Technicians who transport the waste on site inspect the waste for proper containment, labels, and completed documentation. They

will not move waste that lacks these items. When unlabeled and unidentified materials are found, NETL sends samples to a contracted laboratory to test for RCRA hazardous characteristics (e.g., toxicity, ignitability, reactivity, and corrosiveness).

According to the procedure, the collection occurs each month or as needed. At the collection area, a technician checks the containers for appropriate internal manifests, and the waste may be repackaged into lab-packs for purposes of transportation. Wastes are held only temporarily in the collection area until the next pickup by the contracted transporter. Storage on site is less than 90 days for

non-universal hazardous waste regulated by RCRA. The hazardous waste coordinator assures proper labeling on the waste at the time of pickup by the contracted transporter.

Despite training and the various administrative controls, including the planning that precedes the issuance of a SARS permit, there is always the possibility that someone may dispose 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 sample wastewater discharges monthly for metals, various organic compounds, pH, biological oxygen demand (BOD), total suspended solids, and total oxygen content (TOC). A full suite of chemical analyses are conducted on wastewater annually. If anomalous readings are obtained during the monitoring of the dedicated laboratory wastewater sewer system, troubleshooting begins. If necessary, ES&H staff will sample fixture traps and drains to locate the source of the chemicals. Spill kits are provided in areas where chemicals are handled. Floor drains are connected to the onsite pretreatment facility, where NETL staff may be able to detain and neutralize any spilled chemicals before release offsite.

Morgantown stores its waste indoors within a specially designated area, which requires a key for entry. Extra spill protection is provided by an epoxy coating on the concrete floor, which drains to sump pumps connected to catch containers. The building is constructed with blast abatement and spill containment features to minimize the potential risks of spark-induced ignition and the spread of contaminants in the event of an explosion or leak. Each class of waste is stored in separate rooms to minimize the chance that a leaked material could come into contact with an incompatible substance and cause a reaction. An employee is assigned to perform daily inspections and keep records of the results. RCRA-required worker training is mandatory for all technicians who collect and handle hazardous waste. The initial training is supplemented periodically with refresher courses. All NETL employees take general awareness training. 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 in West Virginia. At the Morgantown site, there are additional aboveground storage tanks designed to hold acids and bases as lab feeds. For the Gas Process Development Unit, there was one tank designated for holding sulfuric acid ( $H_2SO_4$ ) at 93 weight percent concentration. There are two tanks designed to hold sodium hydroxide at 50 weight percent and 20 weight

percent concentrations, respectively. The tanks designed for sodium hydroxide storage were never utilized and have been empty since installation. In 2005, the tanks designated to hold acid were thoroughly cleaned and prepared for decommissioning. The sump water (which consists of rainwater) collected in the secondary containment area associated with these tanks is being discharged to the storm water drains.

To deal with the possibility of emergencies, the Morgantown site maintains an emergency response system, including a hazardous materials team. Several NETL directives specify the response to emergencies. If a spill occurs, the first person to notice the spill has the responsibility to report it immediately to site security. This will initiate an investigation and response that is proportional to the perceived potential threat or risk. NETL personnel who participate on the hazmat team or other response teams are trained to contain and control a spill or cleanup, as warranted. Emergency response drills are conducted annually. Where potentially needed, lab-specific operating procedures specify how to control and shut down various lab activities in the event of an emergency.

During 2007, hazardous waste management inspections continued to focus on proper control of hazardous materials within lab spaces. Any deficiencies were entered into the AHS tracking system, and appropriate actions were taken to correct these findings. The WV DEP Division of Water & Waste Management conducted an inspection during 2007.

## 6.2 Toxic Substances Control Act (TSCA)

There were no unplanned releases of air pollutants covered by CERCLA or TRI regulations during 2007. 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 more than thirty years ago. 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 non-asbestos fibers. The observed concentrations of asbestos fibers have always been below the clearance level.

## 6.3 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

There were no restricted-use pesticides, herbicides, or defoliant kept on site during 2007. Only general use pesticides were kept and used for routine insect control. A professional pest control company is under contract to spray around the base of office trailers. The ES&H Division is not aware of any spills or releases of FIFRA-regulated substances (e.g., pesticides, herbicides, or defoliant).

## 6.4 Radiation Protection Program

Because the Morgantown site is not a nuclear facility, it does not have a radiological program of comparable size and complexity to programs found at nuclear facilities.

The site does not generate radioactive materials, and it does not transport, process, treat, store, or provide onsite disposal of radioactive waste. NETL does not have an extensive program for protection of the public and the environment from radiation hazards, because its sources are all small, sealed instrumentation sources that are returned to the instrument manufacturer when no longer used. For these reasons, the radiological program at the Morgantown site has been described within our regular ES&H (non-radiological) program information. Additional information may be found in [Section 4.4](#) (Atomic Energy Act of 1954), and [Section 4.3](#) (DOE Order 435.1, Radioactive Waste Management). Non-applicable radiological program requirements for NETL in 2007 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 Radionuclide Other than Radon from Department of Energy Facilities
- DOE Order 5400.5, Radiation Protection of the Public and the Environment
- DOE Order 435.1, Radioactive Waste Management.

## 6.5 Air Quality and Protection Activities

The first of three environmental media protection programs is the Ambient Air Quality Program. Significant requirements and responsibilities of this program are listed in NETL Procedure 450.1-1, NETL Ambient Air Quality Management. Under this program, the air quality manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Several EMPs have been created which focus attention on a few of the emissions categories or sources where NETL can make the most improvement. To maintain quality control in our program, NETL selects and subcontracts analytical work only to EPA-certified laboratories. These laboratories must submit their QA/QC manuals to NETL for inspection, and the NETL site support subcontractors submit quality control samples (duplicates, blanks, and spikes) to the laboratories to verify the quality of the analyses. Where possible, air emissions monitoring systems onsite are checked or calibrated.

NETL staff began sampling the emissions of TRI-listed compounds in laboratory fume hoods and flues as part of the ISO 14001 efforts. Under EMP 5.5, various devices were employed to sample organic compounds within the ductwork and stacks. These investigations identified the various compounds in the vents and measured the emission rates of these compounds. The results of the hood emissions monitoring activities may be used for a future EMP designed to reduce emissions as part of the Office of Fossil Energy's pollution prevention goals under TRI. This study aims to determine current emissions, which previously had been estimated using material balance approaches. NETL annually reports its air emissions inventory as an in-house check on its status as a non-regulated source.

There are several EMPs that direct continuous improvement efforts in air-quality protection. Two EMPs are designed to reduce emissions of ozone depleting substances (ODS). One seeks to phase out the use of Class I ODS in smaller appliances, such as drinking water fountains; the second will replace selected large chillers that air condition large office buildings. A third EMP deals with reducing vehicular consumption of petroleum products and the emissions of 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 from the WVDEP website's air-quality index and from the EPA AirNOW webpage. The Morgantown site is not a significant contributor to ambient air quality issues.

During 2007, there were no new source reviews (i.e., Clean Air Act pre-construction reviews) for any Morgantown facility, nor were there any Morgantown facilities with the potential to emit more than 100 tons/year of any designated air pollutant. Prior to 2006, the Morgantown site held one permit for a facility called the Gas Process Development Unit (GPDU). The permit for this one facility was allowed to expire in June 2006. See [Table 6.5](#) for additional information on the expired permit.

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

## 6.6 Water Quality and Protection Activities

Surface water protection at Morgantown is controlled by NETL Procedure 450.1-3, *Surface Water Quality Management*, which is administered by the surface water quality manager (SWQM). Generally, this program includes spill prevention, hazardous waste control, and emergency actions, which are addressed specifically in

other directives. The surface water program covers permits and monitoring for storm water sewers (which are separate from sanitary sewers) and for construction-related disturbances that potentially increase sediment loads in streams. The applicable directives are supplemented by more detailed instructions that are found in the Storm Water Pollution Prevention Plan, which documents the various potential sources of pollution and the prescribed methods for managing the various types of sources. Under the plan, designated storm water outfalls are sampled twice per year and tested for basic pollutants of concern that might indicate contamination from site applications of fertilizer or leaking sewer lines: see [Table 6.6.1a NPDES Storm Water Monitoring Requirements](#). The results of that testing are presented in [Table 6.6.1.b, NPDES Storm Water Analysis Results](#). If a spill were to occur, emergency response procedures would be activated immediately, 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 the developed portion of the Morgantown site, there are four drainage areas that have rainwater runoff collection systems and regulated outfalls to the nearby surface streams.

- Outfall 002 drains an area that holds the majority of the facilities for material handling and is approximately 509,652 square feet in area.
- Outfall 003 receives drainage from a hillside beside B-17 and drains an area of 43,560 square feet. The permit does not require monitoring of this outfall.
- Outfall 005 drains an area that includes Building 19 (warehouse, machine shop), Building 33 (hazardous materials temporary storage), and various research facilities. It drains an area of 209,088 square feet.
- Outfall 010 drains parking areas, offices, and a large section of undeveloped land. It drains an area of 3,197,304 square feet.

The outfalls at the Morgantown site are monitored according to General Permit Registration #WVG610042 under NPDES Permit #WV0111457. Potential sources of spills of petroleum products and oils are aboveground storage tanks, oil-filled transformers and switches, a hazardous waste accumulation facility, and 55-gallon drums stored at several locations (Buildings 5, 19, and 36). There are six aboveground storage tanks that contain petroleum products (diesel fuel and gasoline) and one that contains ethanol, for a total capacity of

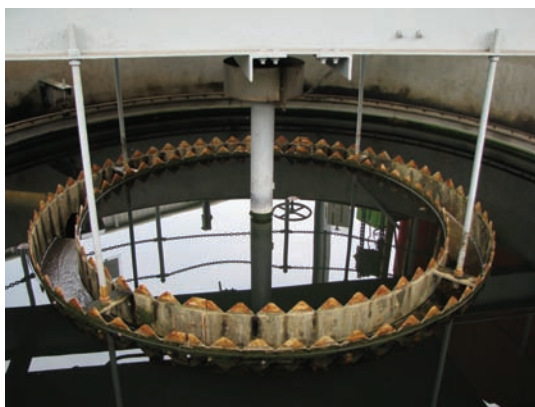




2,900 gallons. Three of the aboveground storage tanks are located inside the area drained by Outfall 002. There are two additional aboveground storage tanks located in the drainage area of Outfall 005, and the remaining two are in the drainage area of Outfall 010. The site has 25 oil-filled transformers and two oil-filled switches, all of which have been tested for PCBs. There are no buried or partially buried storage tanks at the Morgantown site.

An oil-water separator is installed inside the runoff collection system of the new parking garage, but there are no other treatment systems for storm water at the Morgantown site. Based on previous test results, the primary concern with surface water impacts from the site has been sediment loading. Sediment loading of surface water runoff affects Burroughs Run along the southeastern margin of the site, West Run along the northeastern margin of the site, and a small stream that traverses the northern portion of the site and empties into West Run. The State of West Virginia has recently launched a program to categorize streams by water quality and to establish minimum water quality criteria for each category. It is anticipated that both West Run and Burroughs Run would be categorized as impaired streams that require the establishment of total maximum daily loading (TMDL) limits and further regulation. West Run is highly acidic from mine drainage located on the upper reaches of the drainage basin, and suburban development is increasing within the basin. Burroughs Run drains an area of significant urban and suburban development, which contributes typical urban/suburban pollution (e.g., oil, salt, pesticides, and herbicides).

Although storm water runoff is handled by storm water sewer systems, a completely separate and dedicated sewer system handles the industrial wastewater. A third separate and dedicated sewer system on site handles the domestic sewage. Industrial wastewater quality on site is controlled by NETL Procedure 450.1-4, *Industrial Wastewater Management*, which is administered by the industrial wastewater quality manager. At the Morgantown site, industrial wastewater is that wastewater conveyed from laboratory sinks and laboratory facilities where pollutants other than normal domestic sewage might enter the wastewater stream. The industrial wastewater enters a clarifier located onsite, where the wastewater is sampled monthly. From the clarifier the industrial wastewater enters the onsite domestic sewage lines that empty into the municipal sewers owned and operated by the Morgantown Utility Board (MUB). The discharge is regulated under Pretreatment Permit Number MUB 012. Periodic sampling is performed, and the samples are analyzed by a laboratory chosen from a list certified by the EPA. Discharge monitoring reports (DMRs) detailing monthly sampling and analysis are provided to



the MUB, and those reported in 2007 are provided in [Table 6.6.1.c](#), *NETL-Morgantown 2007 Wastewater Effluent Analysis*.

The NETL monitoring activities help to enforce the requirement that hazardous wastes are not permitted in the laboratory drains or other drains, except in the trace quantities that normally originate from washing laboratory equipment and glassware. Managers are required to provide suitable containers in laboratories for the collection of materials that are not permitted in the drains. If hazardous materials or petroleum products accidentally spill into the sewer system, NETL must follow the emergency response and notification procedures specified by the Spill Prevention and Control Management and the Comprehensive Emergency Management System directives (NETL P 450.1-5 and NETL O 151.1, *et seq.*, respectively). Hazardous waste must be handled in accordance with NETL's directives on this subject. If pollutant concentrations repeatedly exceed permit limits, NETL will initiate surveillance of drains and fixtures that discharge into the industrial wastewater system to identify the source.

Protection of surface water and groundwater requires the prevention of leaks from storage tanks. Accordingly, NETL instituted a program under NETL Procedure 450.1-5, *Spill Prevention and Control Management*, which is under the oversight of the 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 fires, explosions, emissions, or spills of hazardous materials must have written operating plans that address precautions to prevent an emergency and actions to be taken during an emergency.

The program manager must identify potential spill sources on site, establish visual inspection programs, generate lessons learned (and program improvements) from past spills, and coordinate the implementation of this procedure with the NETL emergency response activities. There have been no reportable spills of toxic or hazardous materials within the notification period (November 1996 to the present) of the current general storm water permit.



Aboveground storage tanks are visually inspected on a weekly basis and have their interstitial cavity checked quarterly. Visible leaks are corrected immediately. Oil-filled transformers and switches are visually inspected daily. If leaked materials are observed within secondary containment or on the surrounding ground surface, the material is collected or absorbed with spill kits. To the extent practicable, contaminated soil and rainwater are collected and disposed in accordance with regulations. Steel 55-gallon drums are stored in areas protected from rainwater and within a secondary containment. Large spill containment kits are used routinely as a means of secondary containment underneath the drums, and spill kits are kept nearby. The Hazardous Waste Accumulation Facility (Building 33) is designed and constructed to be compatible with the materials stored there and with the conditions of storage. Leaks within this facility will drain to sump areas that have manual sump pumps for collection of liquids. All of the storage area of Building 33 is inside, and the facility is inspected each week. Hazardous materials are not conveyed through underground pipes. All aboveground pipe valves are inspected when the associated tanks are inspected. All tank-filling operations must be attended constantly, and offsite personnel are accompanied by NETL personnel when they enter the site for refueling or loading operations.

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

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

## 6.7 Groundwater and Soil Quality Protection Activities

Groundwater protection on site is administered through NETL Procedure 450.1-2, *Groundwater Quality Management*, which is managed by the groundwater quality manager. This is a program that covers regulatory requirements and best management practices for preventing leaks and spills, monitoring groundwater and soil, removing contaminated soil, and closeout actions. The directive is supplemented by more detailed information and instructions that are found in the Groundwater Protection Management Plan, which documents the site hydrogeology, various potential sources of pollution, potential contaminants that should be monitored, methods of well installation and sampling, a monitoring strategy, and QA/QC processes related to having water/soil samples analyzed by a contracted laboratory.

Maps of the site aquifers and wells are contained in the plan. Under the plan, selected monitoring wells are sampled and tested twice every year for general water quality parameters and for selected chemicals or metals that might indicate contamination from known leaks and spills. Should a spill occur, containment and cleanup would commence, and the affected soil would be monitored as necessary for the contaminants of concern. Highly contaminated soil would be removed, if practical. Alternatively, in-situ treatment would begin, unless the contamination levels were sufficiently low to warrant only monitoring. For all water protection programs, quality control in sample analysis is maintained, in part, by choosing an analytical laboratory from a list of EPA-certified laboratories. QA/QC samples are submitted at least annually to further verify the quality of the analytical results.



The primary strategy for groundwater protection is one of spill and leak prevention. Together, a Spill Prevention, Control, and Countermeasures (SPCC) Plan and a Storm Water Pollution Prevention Plan lay out the strategy for minimizing the risk of unintentional releases and quickly responding to an unintentional release in an effort to minimize environmental contamination. In addition to these efforts, the Morgantown site initiates new projects only after a rigorous ES&H review is conducted in accordance with the SARS directives. As part of the SARS process, the responsible person for each project must prepare a set of written procedures documenting how the project is to be operated, how waste and feed-stocks are to be safeguarded, and how to contain and control unintended releases. When a leak or spill does occur and the environment is threatened, the onsite emergency response team is activated, and the facility makes the appropriate internal and regulatory-driven notifications.

Twenty active monitoring wells exist at the Morgantown site (see [Figure 6.7.1](#)). These wells monitor two shallow aquifers within the unconsolidated Lake

Monongahela sediments and one bedrock aquifer, the Morgantown Sandstone. None of these aquifers are used as a source of water in the immediate area.

[Figure 6.7.2](#) shows a generalized cross-section through the site and the relationship between the aquifers.

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

An informal agreement exists between NETL and WVDEP concerning the Pond 005 site located north of Building 7. The pond collected waste from an experimental fixed-bed gasifier. That site is now a parking lot. When the pond was closed and the area was converted into a parking lot during 1985, the closure was not consistent with the state-approved closure plan. Sampling indicated that low concentrations of semi-volatile organic compounds remained in the soil after removal of the pond liner. The plan called for removal of all the contaminated soil. But after removing many truckloads of soil, NETL decided to forego further removal despite the fact that some contaminated soil remained. NETL then constructed a parking lot on the site. The informal agreement subsequently reached with WVDEP requires groundwater monitoring around the parking lot perimeter. NETL continues to comply with this requirement. Five wells (I, J, L, M, and N) associated with the now-closed Pond 005 and completed in the Lake Monongahela sediments are sampled semi-annually for benzene, toluene, ethylbenzene, xylenes, phenolics, cadmium, sulfates, and chlorides. Three wells associated with closed Pond 005 (K, L, and N) have detected cadmium at levels above background. However, these have never consistently exceeded the West Virginia limit of 0.005  $\mu\text{g}/\text{l}$  in groundwater (see [Figure 6.7.3](#)).



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 which had the characteristics of acid mine drainage. 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 was the mitigation method employed.

The only contaminants consistently found in significant amounts in the groundwater at the Morgantown site are those related to the application of salts for deicing

purposes. Sodium chloride is applied to the parking lots and roads, and calcium chloride is applied to the sidewalks and outdoor steps. Wells located near these features and near the runoff routes from these features show significantly elevated levels of chloride compared to background levels (see [Table 6.7.1a](#), [Table 6.9.1b](#), [Table 6.9.2a](#), [Table 6.9.2b](#), [Table 6.9.3a](#), and [Table 6.9.3b](#).)

This impact on groundwater is a problem that is shared with many businesses and road maintenance activities in this region, but it is considered a necessary safety practice to prevent injuries to site personnel and visitors.

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



mandate of DOE Order 5400.1, *General Environmental Protection Program*. Although DOE Order 5400.1 no longer exists, samples from a large number of wells were analyzed between 1993 and 2002 for a lengthy list of analytes. This list of analytes included all organic compounds known to have been detected in analyses of the coal tar waste from the aforementioned gasifier, the Pond 005 bottom sludge, and the sampled soils beneath Pond 005. It also included metals alleged to have been present in the Stretford solution used to remove sulfur oxides in the off-gas from the gasifier. No organic compounds were consistently detected during 10 years of sampling, and no consistent indications of contaminant concentrations above the state limits have been

found. Only one analyte (cadmium), traceable to the operation of the closed pond, has been detected.

After more than 10 years of monitoring, groundwater conditions are well understood. Spills and leaks in the past have not significantly degraded the groundwater on site. The facilities and most of the underlying contaminated soils associated with spills and leaks in the past have been removed. In recent years, operations have changed greatly, and there are now few large projects that could create significant groundwater contamination. At this point, most of the research is bench-scale and uses small quantities of chemicals and solvents. Accordingly, the groundwater analyses have been significantly curtailed. Under the new scheme, wells will be sampled each spring and fall. Wells located around the perimeter of the developed portion of the site in the two shallow aquifers will be tested to check water quality as it enters and leaves the developed area. For the deep aquifer, sampling will continue for one up-gradient well and three down-gradient wells. The original list of measurements and

compounds analyzed, which was presented in the annual site environmental reports for previous years, has been reduced to the list presented in this year's report. The results of the groundwater monitoring conducted during 2007 are presented in the Appendix as [Table 6.9.1a](#), [Table 6.7.1b](#), [Table 6.7.2a](#), [Table 6.7.2b](#), [Table 6.7.3a](#), and [Table 6.7.3b](#).

## 7 PITTSBURGH

### 7.1 Site Description

The Pittsburgh site resides within Allegheny County, Pennsylvania at a location locally known as the Bruceton Research Center. This is approximately 13 miles south of Pittsburgh, PA, in South Park Township. It is approximately 60 miles north of Morgantown, WV. Geographically, the facility sits within the rolling hills and steeply incised stream valleys that are tributaries of the Monongahela River. The Pittsburgh site is a partially wooded tract with scattered industrial and office buildings. When the Pittsburgh site was first developed, the immediate vicinity was completely rural. However, the population and housing densities have increased dramatically in recent years.

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

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

### 7.2 Major Site Activities

**Facility Repairs Completed.** NETL had been experiencing increasing problems with the iron pipe water lines that supply all of the potable and fire water for the R&D plateau operations. Problems with this 50-year old system included unpredictable pipe ruptures and inoperable shutoff valves. On several occasions, line ruptures caused turbid water to be released into nearby Lick Run, creating an environmental incident. In addition, disruption of the water supply impeded the effective performance of site activities. In 2007, additional water lines were replaced and new isolation valves installed so that future environmental releases from broken water lines will be reduced. This replacement project is estimated to be eighty percent complete despite the completion of significantly more replacement work in 2007, and a similar estimation of completion in 2006. This is because additional information is being made available as the repair work progresses, allowing for a more accurate



estimation of the total replacement that is necessary to be performed before the project is completed. The complete replacement is now expected to be finished sometime in 2009.

Several improvements were made to the Building 74 Industrial Wastewater Treatment Facility. Particularly noteworthy were upgrades to the water filtration system using state-of-the-art electronic controls. This has had a substantial impact on the quality of wastewater discharged into the system. There were no (0) notice of violation (NOV) received for NPDES permit violations in 2007 due to the control technology implemented in Building 74. In addition, the ventilation system was upgraded to address health concerns to employees of the facility. A high efficiency HVAC system was installed using the existing piping and connected to the Building Management System (BMS).

The Building 64 Hazardous Waste Processing Facility was fitted with new nitrogen lines and new hazardous gas sensors. This was performed to ensure that hazardous waste workers are protected from potential hazardous material exposures.



An energy management retrofit project in Building 94 continued in 2007. Phase 8 of this project was performed in 2007 and involved the replacement of two 225-ton class I chlorofluorocarbon (CFCs) chillers with two high efficiency CFC-free 167-ton chillers. In addition, new high efficiency boilers and new air handlers were installed, and all of this equipment was integrated into the BMS controllers.

The Building 84 research laboratory renovation project continued in 2007. This included installation of supplemental air conditioning and a chilled water system to maintain constant temperature and humidity in this controlled laboratory area.

A comprehensive renovation of the third floor of the laboratories in Building 83 was initiated, including relocation of existing functions and upgrading of utility functions. A plan to relocate the extensive library holdings in the building was devised, and the process of relocating materials while minimizing the impact to patrons was initiated. The electrical wiring for the third floor was upgraded and a new state-of-the-art, high efficiency, HVAC system was installed with connections to the BMS. Two large laboratories were constructed using a flexible laboratory technology similar to the Carnegie Mellon University intelligent laboratory system. This technology permits laboratories to be easily reconfigured to meet changing laboratory requirements, thus negating the need to reconstruct laboratories when research needs change.

The Building 920 offices and security facilities were renovated to remove all of the asbestos containing floor tiles and mastic. New interior walls were installed with

energy efficient insulation to provide energy savings to the building. A new high efficiency perimeter hot water heating system was installed to provide energy efficient heating to the building. An energy-efficient air conditioning system complete with variable frequency drives on the connected air handlers was installed to provide superior cooling to the building. All of the exterior windows and doors were replaced with highly insulated, thermally smart windows and doors.

## 8 COMPLIANCE STATUS

### 8.1 Environmental Restoration and Waste Management

#### 8.1.1 CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 (40 CFR 300-310; 43 CFR 11) requires federal facilities to comply with the provisions of CERCLA and imposes an additional set of regulations related to site studies and to notices for the sale and other transfers of federal real property. Specifically, this section makes all CERCLA guidelines, rules, regulations, and criteria applicable to federally-owned or -operated facilities, including: (1) preliminary assessments for facilities at which hazardous substances are located; (2) possible inclusion of such facilities on the National Priorities List (NPL); and (3) remedial actions at these sites. Federal facilities are not required to comply with CERCLA provisions regarding financial responsibility and removal/remediation contracts with state governments. Federal facilities that are not on the NPL still may be subject to state laws concerning removal and remediation actions. However, these state laws and regulations may not impose provisions that are more stringent than those applicable to non-federal facilities. EPA administers the CERCLA program in cooperation with the Commonwealth of Pennsylvania for the Pittsburgh site. The CERCLIS database lists information about the Pittsburgh site. The site is not listed as an NPL site during 2007 or at any other time in the past.

The Pittsburgh site is listed as undetermined on the EPA CERCLA Section 120 List. This is because NETL detected onsite soil and groundwater contamination prior to 1997 and has not been issued a further remedial action plan letter. Each year, including 2007, NETL provides a status report to the US EPA through the DOE Environment, Safety, and Health Program Office. The status report states the following:

*The site sampling and analysis program has been completed. Remediation for areas of concern was completed during FY 1997. Based on the sampling and analysis, no further significant soil remediation is planned. The human health and ecological risk assessment is in the process of being updated. The current conclusion is that exposure to media at the facility is not expected to generate adverse health effects in onsite or current receptors.*

*Groundwater monitoring continued on a routine basis. EPA has been requested to perform a Docket Review and the Laboratory is waiting on the Docket Status Determination [which is “Undetermined”].*

### 8.1.2 SARA Title III

SARA Title III requires the reporting of hazardous chemicals that were present at a facility in excess of certain quantities during the preceding year. This includes gases and solid chemicals designated as extremely hazardous substances in amounts greater than or equal to 500 pounds, liquids in amounts greater than or equal to 55 gallons, or amounts greater than or equal to the threshold planning quantity (TPQ). It also requires reporting of all other hazardous chemicals present at the facility during the preceding calendar year in amounts equal to or greater than 10,000 pounds.

[Table 8.1.2](#) lists those chemicals reported by the Pittsburgh site for 2007, commonly known as the Tier II Chemical Inventory Reporting List. NETL maintains an active inventory of all hazardous and extremely hazardous chemicals on site, along with the MSDS for each of these substances.

The screenshot shows a software window titled "Facility Tracking System: NETL - U.S. DOE". The main content is a table titled "Tier II Collection - Browse (by Facility by Year) (\*2)". The table has columns for Facility ID, Report Year, Chemical Name, CAS Number, Max. Amt., and Avg. A. The data rows are as follows:

Facility ID	Report Year	Chemical Name	CAS Number	Max. Amt.	Avg. A.
MGN	2003	HYDROGEN SULFIDE	01007783-06-4	02	02
MGN	2003	NITROGEN DIOXIDE	01010102-44-0	02	02
MGN	2003	SULFURIC ACID	007664-007664-93-9	03	03
MGN	2004	HYDROCHLORIC ACID	0007647-01-0	03	02
MGN	2004	SULFURIC ACID	007664-007664-93-9	03	03
MGN	2007	(007647-01-0)	007647-01-0	03	03
MGN	2007	(007664-93-9)	007664-93-9	03	03
MGN	2007	(007783-06-4)	007783-06-4	03	03
MGN	2007	(010102-43-9)	010102-43-9	02	02
PGH	2003	HYDROCHLORIC ACID	0007647-01-0	03	03
PGH	2004	HYDROCHLORIC ACID	0007647-01-0	03	03
PGH	2004	NITRIC OXIDE	01010102-44-0	02	02
PGH	2007	(007446-09-5)	007446-09-5	03	03
PGH	2007	(007647-01-0)	007647-01-0	03	03

The Pittsburgh site does not prepare a toxic release inventory (TRI) (Form R) because the site does not use, produce, or process any of the listed toxic materials in quantities that exceed the threshold amounts. During 2007, there were no releases that would trigger emergency notification as required by either Emergency Planning and Community Right-To-Know Act (EPCRA) or CERCLA.

Section 312 of SARA Title III requires NETL to provide an MSDS to the Pennsylvania Department of Labor and Industry, Bureau of PENNSAFE; the Allegheny County Department of Emergency Services; the South Park Local Emergency Planning Commission; the South Park Township Police; the Library Volunteer Fire Department; and the Broughton Volunteer Fire Department for each hazardous chemical and each extremely hazardous substance that was reported for the previous year. The Pennsylvania Emergency Response Commission, the local emergency planning commission, and the local fire departments have been advised of all materials and quantities and their locations on the Pittsburgh site.

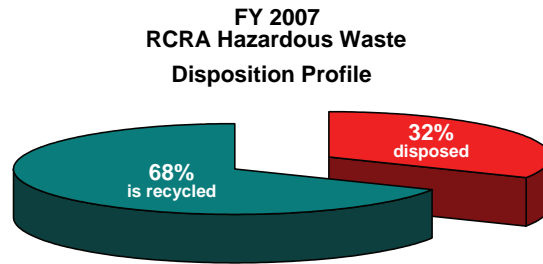
As part of the ongoing commitment to improve emergency planning under the SARA Title III Program, NETL has established targets for reducing the accumulation of hazardous chemicals on site. The intent of these targets is to avoid the unnecessary accumulation of potentially hazardous chemicals in the laboratories while maintaining sufficient chemical stores to complete mission-related research. Year 2002 inventories provided a baseline for the target to reduce the number of containers that contain hazardous chemicals. The number of containers that contained hazardous materials in 2002 was 6600. The objective for this target is to reduce the number of containers 20% by 2007, and 30% by 2010.

NETL achieved a reduction in number of containers by 294 over the target of 1320 containers, for a total reduction of 1614 containers (24.5%). This demonstrates the commitment made to reduce the risk posed by such chemicals. The targeted reduction was surpassed because laboratory personnel were encouraged to clean out their laboratories and remove chemicals that were no longer needed. This accomplishment was assisted by an improvement to the program which involved the implementation of a real-time chemical inventory system that enables NETL to submit chemical inventory reports in a timely manner, thus avoiding a time lag in removing chemicals from the inventory list.

### 8.1.3 RCRA Program

Hazardous waste operations at the Pittsburgh site complied with all applicable federal, state, and local regulations that apply to the handling, storage, and disposal of hazardous waste during 2007. 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 Parts 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 Parts 171-179, DOT Hazardous Materials regulations apply to the NETL hazardous waste program. NETL Procedure 435.1-1B (now P 450.1-9A), *Waste Handling, Storage and Disposal*, is used to implement these regulatory requirements.

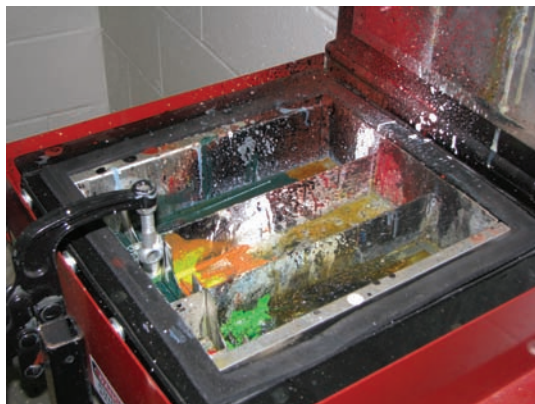
PADEP is authorized to enforce the federal and state hazardous waste management requirements at the Pittsburgh site. The hazardous waste operations personnel frequently review current waste industry newsletters and bulletins, receive information from the Academy of Certified Hazardous Materials Managers, read NETL's regulatory compliance reviews, attend the hazardous



waste operations training annually, and attend the hazardous materials transportation training every three years.

Pittsburgh 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 to transport, and therefore does not transport, hazardous waste. All hazardous waste removed during 2007 was transported by American Environmental Services (AES), Inc., to their storage and treatment facilities. The AES facility combines small packages of similar waste and repackages the waste for more cost-effective shipment to a final disposal facility, which is selected by AES and monitored by NETL. Nonhazardous waste (normal office waste that is not being recycled and cafeteria waste) are transported to a local landfill using commercial waste disposal services.



The amount of hazardous materials and waste removed from the site remained relatively the same as in previous years. Pittsburgh generated 6,811 pounds of hazardous waste during 2007. The small increase in waste generated can be attributed to clean out of an entire floor of laboratory operations, clean out of small projects this year that are no longer in use and to an aggressive program to reduce the chemical footprint. The latter was done by contacting various researchers to verify that all chemical materials are still needed. Any items that were deemed unusable were disposed. See Section 3.4, Environmental Objectives and Targets, for an explanation of how this quantity was established. This reduction was accomplished using a multitude of efforts. For example, when unused and unopened chemicals were received for disposal, they were offered to other researchers for potential use. Less hazardous or nonhazardous chemicals were substituted for requested hazardous chemicals when possible. Batteries and fluorescent bulbs were sent to recyclers. Used computers were offered to schools or offered for sale as excess government property.

Liquid wastes are kept in drums. The Pittsburgh site does not have a storage or treatment pond, nor are there underground storage tanks in Pittsburgh for petroleum or hazardous waste. There are no aboveground storage tanks for

hazardous waste. No leaks were reported from storage tanks during 2007. Liquid acids and bases are collected monthly at satellite accumulation areas and are analyzed for acidity.

Waste handling and management personnel ensure regulatory compliance by:

- Weekly walk-through inspections of the Chemical Handling Facility.
- Monthly pickups at satellite accumulation areas.
- Battery pickups at various locations.
- Participation in the SARS process.
- Participation in ERO exercises.
- Training on hazardous waste management.
- Regulatory reviews.
- Attendance at conferences addressing hazardous waste requirements.

Pittsburgh complies with the RCRA hazardous waste manifest requirements before wastes are shipped from the site. The NETL hazardous waste coordinator initiates the documentation and coordinates the completion of the manifest with AES, Inc. and the 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, and contracts, is retained by the hazardous waste manager, with copies sent to the ES&H Records Center.

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

Waste handling personnel who collect the hazardous wastes first inspect the container, the labels, and the internal documentation to ensure that the



wastes are properly packaged and labeled and that the required documentation is complete and accurate. The waste handling personnel are not allowed to accept or move any hazardous waste without proper packaging, labeling, and identification. The responsibility for identifying the waste rests primarily with the hazardous waste generator.

NETL's hazardous waste manager ensures compliance with applicable regulations by overseeing the entire hazardous waste program. Periodically, the hazardous waste manager reviews the program and brings any deficiencies to the attention of the appropriate individuals or managers and ensures the development, accuracy, and submission of the Biennial Hazardous Waste and Waste Minimization Reports to the Commonwealth of Pennsylvania. The manager also 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, and bills of lading) 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 instruction on the proper handling techniques and disposal methods for chemical waste.

## 8.2 Toxic Substances Control Act (TSCA)

Pittsburgh 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, Pittsburgh is not subject to TSCA reporting requirements. No PCBs are kept on site for lab use or as a dielectric fluid inside electrical transformers. Oil-filled equipment is occasionally discovered on site. Since it cannot be ascertained whether it was manufactured after July 2, 1979, it is presumed to contain PCBs at a concentration greater than 50 parts per million. NETL disposed of 30 pounds of such presumed waste in 2007, consisting of capacitors and lighting ballasts (transformers) from construction and maintenance activities. [Table 8.2.1](#) lists the TSCA-regulated chemicals held at Pittsburgh in quantities greater than 10 pounds.

Asbestos is perhaps the most abundant TSCA-regulated substance retained on site. NETL has never manufactured asbestos, but used it extensively in building materials purchased and installed in prior years. Most is contained within floor tile and floor tile mastic installed on the floors of several lab buildings (e. g., Buildings 86, 94, 141, 903, and 920). The remainder is contained in roofs and in laboratory furniture (Buildings 83, 86, 94, and 921). In 2007, asbestos in Building 74 was removed and the building given clearance from asbestos from the Allegheny County Health Department. Asbestos remaining inside buildings is well encapsulated by the matrix

material (e.g., floor tiles). Air monitoring has revealed no shedding of asbestos fibers. Asbestos is also found on-site in some gaskets and inside some lab devices, such as muffle and tube furnaces.

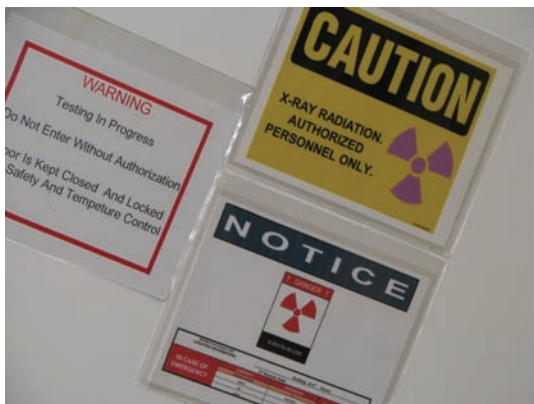
### 8.3 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

There were no restricted-use pesticides, herbicides, or defoliants kept or used on site during 2007. Only general use herbicides were kept and used for routine vegetation control along fence lines, guard rails, and flower beds. This included Prosecutor Pro<sup>®</sup>. A commercial pest control company provided integrated pest management services in the cafeteria, in and around the daycare center, and around Buildings 95 and 903. Talstar<sup>®</sup> crystals are spread on the grass to control insects. Demand<sup>®</sup> is used in the cafeteria, at the daycare center on door thresholds and window sills, and outside Buildings 95 and 903 to prevent insects from entering the building.

### 8.4 Radiation Protection Program

Use of radioactive materials at NETL is limited to research instrumentation that contains sealed radioactive sources (see [Table 8.4.1](#)) and radiation-generating devices (see [Table 8.4.2](#)). NETL does not generate, process, or treat any radioactive material, and it does not have on site any temporary or permanent facility for radioactive waste disposal. An inventory of radiation sources is actively maintained and monitored by the radiation safety officer. Information is retained about the item, isotope, quantity, custodian, location, status, and sealed source activity. Title 10 CFR 835.901(e), DOE Policy 441.1, and NETL Procedure 440.1-17 are the applicable regulations and

requirements. In addition, best management practices include DOE implementation guides, EPA information, NRC information, and Commonwealth of Pennsylvania recommendations and requirements.



All of the radioactive sources are sealed and are used in instrumentation. The site support contractor has the required NRC license for the three Ronan Engineering Company level density gauges. Pittsburgh

has two sealed-source electron capture devices that are licensed through the manufacturer. In total for the site, there are ten radiation-generating devices in six radiological control areas at Pittsburgh. The five devices described above use radioactive source materials, and the other five are instruments that produce X-rays. These instruments include two scanning electron microscopes, an electron spectroscopy chemical analyzer, an X-ray diffraction instrument, and an X-ray scanner in the mailroom.



Radiation monitoring performed at Pittsburgh consisted of body thermoluminescent dosimeters (TLD) and finger rings for the employees in the mail facility. In addition, there are specific radiological control areas which have dosimeter badges continually displayed. Leak testing was not required and was not performed in 2007 on any sealed sources because they have all been removed from service. NRC requirements do not include required testing for sealed sources that are not in service. There were not any radiation leakage or exposure problems during 2007.

## 8.5 Air Quality and Protection Activities

The NETL Ambient Air Quality Management Program is concerned with protection of outdoor air quality. This includes the applications for air emissions permits that allow NETL to conduct research into the science of reducing air emissions. The program is regulated by the Allegheny County Health Department (ACHD), which is authorized to administer Title V permits under the Clean Air Act Amendments. The air quality manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Air emissions are reported annually in accordance with the three air permits maintained at the site. One permit (#7032056-000-00500) is for a 4,500,000-Btu/hr Cleaver Brooks natural gas-fired boiler located inside Building 922. The second permit (#7032056-000-00501) is for three RayPak finned copper tube boilers located inside Building 922, each having a 1,630,000-Btu/hr input rating. The third permit (#7023056-000-00800) is for the 500-lb/hr gas- and coal-fired research unit located inside Building 86.



The site was designated as an administratively synthetic minor source by the Allegheny County Health Department (ACHD), and this designation continued through 2007. A synthetic minor source is a source that accepts an emissions limit that allows it to remain outside of the federal permit program. It is any source that has its emissions administratively limited below certain thresholds by means of a federally enforceable order, rule, or permit condition. A synthetic minor source site pays a fee for the work involved in establishing the order, rule, or permit condition. After the synthetic minor source determination is complete, the source then becomes a registered source with the agency. An administratively acceptable 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, and, in 2007, none of the three combustion units were operated.

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 a worst-case potential to emit emissions. This model takes into account the type, quantity and total burn time of the fuel to determine the estimated emission level. The results of this modeling are summarized in [Table 8.5.1](#). Several of the largest combustion units at the Pittsburgh site are now in the planning process for decommissioning and demolition. These units are the 500-lb/hr Combustion Unit and the Combustion and Environmental Research Facility (CERF). The third large unit is the flexible Modular CO<sub>2</sub> Capture Facility (MCCF), which is now in a mothballed/inactive state. Due to the size of the MCCF's combustion capabilities, the Pittsburgh campus remained a Title V synthetic minor source throughout 2007.

In years past, the three large units contributed the vast majority of site emissions. Other operations that still contribute site emissions include: the Raypak boilers in Buildings 58, 84, 900, 920, 921, and 922; three Kewanee boilers in Building 84; two Weil McLain boilers in Building 74; three Patterson Kelley boilers in Building 94; unpaved roads (a source of particulates); and paved roads.

NETL is not required to perform continuous air monitoring to determine emission levels and is in compliance with all permit requirements for the 500-lb/hr Combustion Unit and for the boiler air emissions permits. There were no NOVs and no unplanned air emissions during 2007.

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 onsite is steadily decreasing. Older ODS-containing equipment is being replaced, and the use of Class I ODSs is being phased out for the HVAC equipment. For example, water fountains that contained Class I ODSs in their chiller units continued to be replaced across the site during 2007. Systems and appliances with environmentally friendly substitutes are being used to replace the Class I ODS-containing systems and appliances.

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

## 8.6 Water Quality and Protection Activities

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

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

Applicable federal, state, and local regulations potentially affecting these activities are reviewed, and compliance is ensured before approval to operate is given by the ES&H staff.



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

The Pleasant Hills Authority (PHA) issued the current Industrial Sewer Use Permit to NETL on December 28, 2001. Conditions placed on NETL by the permit limit the quantity and quality of effluent constituents (free cyanide, phenolics, mercury, copper, chloroform, and pH) that may be discharged into the wastewater. The permit requires NETL to submit all wastewater analysis data for the treated wastewater effluent discharged through the WWTF to PHA's consulting engineering firm, Gannett Fleming, Inc., on a semiannual basis. [Table 8.6.1](#) contains the results of the 2007 monitoring. During this semiannual sampling, PHA conducts sampling and analysis independently. NETL also provides the PHA with the monthly sampling analysis at their request, although these data are not required by the permit.

In addition, NETL is required to prepare an annual wastewater report that contains no analytical data, but rather summarizes information about the site's industrial waste water discharge, including the volume of wastewater discharged, the number of site employees, the type of waste discharged, and the type of pretreatment performed. [Table 8.6.2](#) provides the industrial wastewater treatment facility effluent sampling results taken at the WWTF during 2007. The permit limits were not exceeded at any time in 2007.

The southern area of the site does not have and does not need an industrial wastewater sewer system separate from the sanitary sewer system that drains to the Clairton Municipal Sewage Treatment Plant, because there are no laboratory operations on the southern area of the site.

Pittsburgh's sanitary sewage from the northern area is combined with sanitary sewage from the other major federal agency on the site, CDC/NIOSH. This sanitary sewage discharge is separate from the discharge of the treated laboratory/process wastewater. In addition to the sampling and analysis performed by NETL and CDC/NIOSH, PHA conducts independent sampling and analysis of wastewater effluent from all these locations. This information is used by the PHA to determine whether any discharges of the treated effluent were in excess of the local limits and required the issuance of a NOV.

The Mine Safety and Health Administration (MSHA) is the other federal agency sharing the environment of the Bruceton Research Center. MSHA is also located on the northern area and has a separate sanitary sewer line from the NETL and NIOSH sub-interceptor discharge that is positioned on the north side of the site. The MSHA sanitary sewer line discharges directly into the South Park (PA) main sanitary line.

The NETL/NIOSH sub-interceptor sanitary sewer line also discharges into the South Park main sanitary line, but at a point much closer to the PHA WWTF. All NETL sanitary sewage from the southern area is routed to, and treated in, the Clairton Municipal Sewage Treatment Plant.



Storm water (surface water) runoff from the 69-acre NETL northern portion of the site exits the site through the northern storm drainage system, a dedicated storm water system that drains directly into nearby Lick Run. This discharge occurs at the NPDES-permitted North Outfall (001). Lick Run is a small natural stream that flows along the eastern boundary of the 238-acre Bruceton Research Center.

Contaminants to the storm water effluent are regulated by an NPDES storm water discharge permit. The contaminants consist of air conditioning condensate, runoff from various impervious surfaces into the site storm sewers, and treated acid-mine drainage from a research coal mine operated by CDC/NIOSH. There was a single reportable release into this permitted system during the year that required NETL to notify PADEP. This single reportable release involved a fire water supply line break on June 20, 2007, that released turbid water into Lick Run.

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

A NPDES storm water discharge permit issued to the Bruceton Research Center lists three outfalls: North Outfall (001), South Outfall (002), and North Outfall Extension (101). The North Outfall Extension discharges directly into the North Outfall. The North Outfall receives storm water from NETL, NIOSH, and MSHA. The South Outfall receives storm water from NETL and NIOSH. The North Outfall Extension receives treated acid mine drainage from the NIOSH mine before it is discharged to the North Outfall.

Storm water discharged from the northern side of the site is regulated through an NPDES permit issued to NETL, NIOSH, and MSHA. Storm water discharged from the southern side of the site is regulated through an NPDES permit issued only to NETL. [Table 8.6.3](#) provides the storm water North Outfall monitoring results for flow, suspended solids, carbonaceous biochemical oxygen demand 5-day test (CBOD5), oil and grease, aluminum, iron, manganese, lead, mercury, pH, and ammonia. [Table 8.6.3](#) also provides the storm water South Outfall monitoring results for flow, suspended solids, aluminum, iron, manganese, lead, pH, and ammonia.

## 8.7 Groundwater and Soil Quality Protection Activities

The Pittsburgh site (see [Figure 8.7.1](#)) is located within the Appalachian Plateau physiographic province. The topography, consisting of rolling hills and ridges, reflects the dendritic drainage erosion of the uplifted Allegheny Peneplain.



All rocks in the area are of sedimentary origin. They are almost exclusively of Pennsylvanian or Permian Age, with the exception of alluvium in the stream and river valleys, which is of Quaternary Age. At the Bruceton location, bedrock is of Pennsylvanian Age and belongs to the Monongahela and Conemaugh

Groups. The contact is identified by the Pittsburgh Coal, which is the basal member of the Monongahela Group (see [Figure 8.7.2](#)).

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

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

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

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

The shallowest aquifer on NETL property is found in the weathered bedrock just below the rock/soil contact and occurs over most of the site, except where it is undermined. Recharge of this unit occurs where rainfall percolates downward into the weathered strata until a continuous horizon of low vertical permeability (unweathered bedrock) is encountered. There are a total of 19 wells screened in shallow weathered bedrock; 7 are located in the Main Plateau area and 12 are in the

Valley Fill area. [Figure 8.7.3](#) and [Figure 8.7.4](#) show the locations of the monitoring wells.

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

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

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

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

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

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

been a report of a domestic water well on Piney Fork Road (approximately 1-1/2 miles south of the Pittsburgh site), but this well could not be located or confirmed by preliminary physical exploration and was not included on the water well inventory.

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

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



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

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

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

The coal seam and associated mine workings have influence on groundwater at those locations underlain by them. Fracturing of overlying strata and actual roof collapse have created conduits that act to dewater the overlying rock. This is the case at Building 167 (and the adjacent triangle parking lot) where the shallow, weathered bedrock zone was dry. Also, the voids created during mining leave open conduits



that allow water to flow down freely, possibly exiting at old portals. Mining may have removed underlying fireclays usually associated with the bottom of coal seams, opening up the possibility for downward migration of water into the underlying rock.

The Groundwater Monitoring Program (GMP) has as its primary objective the



monitoring of the shallow, weathered bedrock zone as the first significant aquifer or water-bearing unit beneath the Pittsburgh facilities of NETL.

Contamination entering the ground from soil surface sources would be expected to impact this zone first and foremost; hence, the majority of wells are placed in this zone. The GMP also monitors the wells screened in the deeper water-bearing zone in order to provide data on

water quality and contaminant migration.

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

By properly characterizing local groundwater conditions, it is possible to ensure that potential contamination and potential contaminant migration routes have been suitably identified and investigated. This enables the groundwater program manager to be cognizant of potential continuing contamination and to remediate these contamination sources if warranted.

The 2007 groundwater monitoring was performed according to the NETL-PGH 2007 Groundwater Detection Monitoring Plan (NETL-controlled document #NP001.0804.0271.2001.1.00.0). The NETL-PGH Monitoring Well Locations are identified in Attachment A of this plan. To fulfill a PaDEP storage tank closure request, eight wells were monitored for total petroleum hydrocarbons, diesel range organics, in 2007. Well VFW-9 was under the process of modification, due to construction in the area, during the May sampling event. The results of the NETL-PGH Groundwater Detection Monitoring Program are presented in [Table 8.7.5](#). The results were compared against federal and state standards for groundwater. No standards were exceeded.

Statistical analysis was conducted on two indicators of groundwater contamination (pH and specific conductance) for eight of the NETL-PGH Valley Filled Groundwater Monitoring Wells in the 2007 monitoring data. The analysis compared the up gradient wells to the down gradient wells. The up gradient wells are VFW-2 and VFW-10. The results of the statistical analysis for pH showed that, for the tolerance interval-two tailed method, no wells were outside of the background tolerance intervals. The results of the statistical analysis for specific conductance

showed that, for the tolerance interval-two tailed method, Well VFW-7 was outside the background tolerance limit.

Monthly groundwater elevation measurements to determine contaminant transport were completed in accordance with the Groundwater Protection Management Program. The elevations are consistent with the general groundwater flow patterns described previously.

An element of the Groundwater Protection Program is the surface water - groundwater interaction. A piezometer was monitored monthly in 2007 along Lick Run upstream of the site, and a piezometer was monitored weekly along Lick Run adjacent to the site to determine if Lick Run is a gaining or losing stream. A gaining stream has groundwater flowing to the stream, while a losing stream has surface water flowing to the groundwater. The data collected indicates that Lick Run upstream of the site is a gaining stream for eight out of the twelve months, while Lick Run adjacent to the site is always a gaining stream.

## 9 ALBANY

### 9.1 Site Description

The Albany site, formerly known as the Albany Research Center, is a U.S. Department of Energy materials research laboratory located in Albany, OR. Researchers address fundamental mechanisms and processes; melt, cast, and fabricate up to one ton of materials; completely characterize the chemical and physical properties of materials; and deal with the waste products and byproducts of materials processes.

Albany was established as the Albany Research Center on June 2, 1942, as part of the U.S. Bureau of Mines. Its mission was twofold: to find methods for using the abundant low-grade resources of the area, and to develop new metallurgical processes using electrical energy. It was known at its establishment as the Northwest Electrodevelopment Laboratory. The 42-acre former campus of Albany College was chosen to house the research facilities. In 1985, the Center was named an historical landmark by the American Society for Metals.



In 1995, Congress closed the U.S. Bureau of Mines, but the Materials Partnership Program at the Albany Research Center was transferred to the Office of Fossil Energy of the U.S. Department of Energy. On November 27, 2005, the Albany Research Center became part of the National Energy Technology Laboratory.

In recent years, the site has become a key participant in the DOE Vision 21 and FutureGen initiatives, working on issues involving the durability and strength of key materials for high-efficiency power systems. Center researchers are also involved in developing high-strength, low weight structural components for automobiles. Researchers are also conducting potential breakthrough experiments in carbon sequestration, concentrating their skills on techniques that capture CO<sub>2</sub>, a greenhouse gas, and converting the CO<sub>2</sub> into a mineral form.

In 2007, approximately 80 federal employees worked at the site, along with 30 contractor employees. Operations at the site do not impact surrounding buildings or neighborhoods. There are several buildings on the site which are listed as eligible for protection in accordance with the requirements of the National Historic Register.

## 9.2 Major Site Activities

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

Refractory Material Issues in Gasifiers - Gasification is an efficient and environmentally sound way to use coal or other carbonaceous matter in the production of power, steam, or fuel gas, including hydrogen. It also provides a waste CO<sub>2</sub> stream which is easily isolated for sequestration. One of the byproducts from this process is molten slag, which can damage the refractory or lining material in gasifiers. Researchers at Albany are evaluating different refractory materials and thermocouple designs to reduce the corrosive and damaging effect of molten slag.

Concepts to Improve Sequestration by Mineral Carbonation - This project examines concepts that may lead to improved reaction kinetics and the extent of reaction of mineral carbonation.

## 10 COMPLIANCE STATUS

### 10.1 Environmental Restoration and Waste Management

#### 10.1.1 CERCLA

The Albany site had no offsite remediation activities that were ongoing during 2007, and there were no National Priorities List (NPL) sites for which they had liability under CERCLA/SARA.

#### 10.1.2 SARA Title III

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

There were no onsite CERCLA/SARA cleanups at the Albany site in 2007. There were no releases that would trigger reporting to DOE Headquarters Emergency Operations Center, the U.S. Coast Guard National Response Center, or any other governmental agency.

### 10.1.3 RCRA Program

In 2007, there were no spills or leaks from facilities, operations, or other activities that would lead to RCRA cleanups. There were also no cleanups or surveillance activities for leaks or spills that occurred in prior years.

### 10.2 National Environmental Policy Act (NEPA)

Project managers complete questionnaires regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. In 2007, all funded projects at the Albany site were determined to be categorically excluded.

### 10.3 Toxic Substances Control Act (TSCA)

Albany did not have any spills or releases of TSCA-regulated substances (e.g., pesticides, PCBs, formaldehyde, methylene chloride, asbestos) in 2007.

### 10.4 Radiation Protection Program

#### 10.4.1 Ionizing Radiation Program

There are only x-ray generating devices used for analytical applications at the Albany site. These include scanning and transmission electron microscopes, x-ray diffraction and fluorescence instruments, and a particle size analyzer. [Table 10.4](#) lists the x-ray radiation generating devices at Albany. All are examined annually for leaks and safety controls to insure employee safety. A dosimetry program has been in place since the 1950's to check for employee exposures. No sealed sources are located at the site. No new radioactive materials are brought to the site, however, a few legacy items remain stored in an area identified as a hot cell while awaiting disposal.



#### 10.4.2 Laser Program

The Albany office uses Class I lasers in common office devices, including laser pointers, compact disk readers within personal computers, and fiber-optic communication lines. These lasers are built into devices that protect the consumer through engineering design. Staff members may also have laser pointers that are either Class II or Class III that are commonly used by speakers

during lectures and presentations. A laser safety program has not been implemented at the Albany site and is currently viewed as unnecessary due to the absence of more dangerous, higher class lasers on site.

## 10.5 Air Quality and Protection

Albany has no air quality protection program and no emissions that require monitoring, reporting, or permitting. In 2007 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the Albany site. Operation of the Albany site does not contribute significantly to any emissions under the National Ambient Air Quality Standards (NAAQS). There are no Albany office facilities or projects that are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAPS) Program. Albany office facilities and projects do not have the potential to emit more than 10 tons per year of a single designated toxic air pollutant or more than 25 tons per year in aggregate of all toxic air pollutants, nor are any facilities or projects regulated for any of the 189 toxic air pollutants.

Ozone-depleting refrigerants are used for air conditioning, refrigeration, and chilling. A list of existing ODS is maintained and they are being replaced with more environmentally friendly units on a continual basis.

## 10.6 Water Quality and Protection Activities

Albany holds a wastewater discharge permit with the City of Albany, which was last renewed in 2006 as part of a four-year cycle. In addition, Albany has also filed a slug discharge control plan with the city; it must be renewed every two years. No storm water permit is held by Albany, since regulation is augmented by the city through the wastewater permit. Albany site activities in 2007 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.



In 2007, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards, since all potable water is supplied via a bottled water contract. This water is provided due to the aging water delivery pipes in most buildings at the site. The water supply for Albany comes from the municipal water distribution network and is used for all applications except drinking.

## 10.7 Executive Orders (EO) and DOE Orders

### 10.7.1 EO 13423 -- Strengthening Federal Environmental, Energy, and Transportation Management

This EO ensures that the federal government exercises leadership in the reduction of petroleum consumption through improvements in fleet fuel efficiency and the use of alternative fuels in alternative fuel vehicles. The Albany office has four vehicles that are leased from GSA, including three passenger vehicles and one stake-bed truck. Of the three passenger vehicles, two are alternate fuel compatible, with a passenger van being bi-fuel, using ethanol-85 (E-85) or gasoline, and a pickup truck being bi-fuel, using compressed natural gas (CNG) or gasoline. The third vehicle is a gasoline-fueled vehicle. E85 fuel supplies are becoming more available regionally, while the Albany site has its own slow-fill CNG station. The stake-bed truck is diesel-fueled and is biodiesel-fuel compatible. These vehicles are included in the NETL statistics that are reported to DOE.

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

Albany was certified to the ISO 14001:1996 standard on November 30, 2005, and has continued to maintain that certification throughout 2007. On March 13, 2006, the Albany site was recertified to the ISO 14001:2004 standard.

This EO also 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% by 2010, compared to emission levels in 1990.

For Albany, electricity costs are included in overall utility costs. In the main administrative building (Building 1) at Albany, HVAC systems are governed by a building energy management system that uses timers which are on between 6:00 am and 6:00 pm, and sets back temperatures at night, on weekends, and on holidays. Energy efficient lighting has replaced conventional bulbs in the majority of areas on center as part of a Bonneville

Power Administration (BPA)-sponsored upgrade program, and the staff buys Energy Star® products when the opportunity arises.

EO 13423 establishes a general approach and goals for affirmative procurement and recycling activities by federal agencies. The Albany site has established a recycling program, including plastics, office paper, newsprint, glass, cans, and bottles. Receptacles are provided for the collection of waste office paper and aluminum cans throughout the facility. Various scrap materials from building maintenance are also sent to recycling.

The Albany office purchases refilled toner cartridges and office paper made with recycled materials.

Albany utilizes the small purchasing system, STARS, to buy supplies. This system further encourages affirmative procurement. Individuals who regularly purchase items are instructed to give preference to the purchase of items with recycled content.

#### 10.7.2 DOE Order 435.1 Radioactive Waste Management.

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

### 10.8 Groundwater and Soil Quality Protection Activities

In 2001, Albany initiated a groundwater protection and monitoring program in accordance with DOE requirements. The program follows the Oregon Department of Environmental Quality (DEQ) Independent Cleanup Program, with regulatory input from them. Albany installed 14 monitoring wells onsite in July 2002, and sampled the wells for a broad range of contaminants, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, nitrates, and polychlorinated biphenyls (PCBs) from all of the wells.



Albany also screened for pesticides, herbicides, dioxins, and radiological constituents from a selected subset of the wells. Initial periodic sampling showed concern over elevated levels of VOCs, metals, and radiological constituents, necessitating continued periodic monitoring. Subsequent periodic monitoring events has shown concern regarding excessive turbidity of samples directly influencing metals and radiological results, which resulted



in a review of sampling protocols and a change to require future collection of groundwater samples be performed using U.S. EPA low-stress protocols. This resulted in the discovery of metal and radiological contaminant levels in groundwater at or near background levels for the Willamette Valley in Oregon, where the site is located.

VOC detections during periodic monitoring prompted Albany to further investigate areas of suspected contamination, with planning efforts starting in September 2004 and onsite work initiated in January 2005. Results from samples taken in February 2005 showed contaminants of potential concern (COPCs) were likely crossing the eastern boundary of the site and migrating toward Liberty Elementary School. After meeting with Oregon DEQ and the Greater Albany Public School (GAPS) District personnel, actions were taken to perform site investigations onsite and offsite during March-December 2005. Results of the site investigation showed no concern over surface soils, subsurface soils, soil gas, or ambient air at offsite properties. The only concern identified was with elevated levels of COPCs in groundwater, including trichloroethene (TCE), carbon tetrachloride, and chloroform. Additional monitoring wells have been installed both onsite and offsite at Liberty Elementary School property, which is adjacent to the site (see [Figure 10.8](#) for well locations).

Oregon DEQ initiated sampling of residential wells within an approximate two-block radius of the site due to concerns of residents voiced at town hall meetings and further reviews of the sampling results. A total of 31 residential wells were sampled, with some residential wells (including some used as drinking water) showing elevated levels of COPCs. All of the owners of wells that were used for drinking water have been connected to City of Albany potable water supplies by NETL, and NETL is currently pursuing closing of any wells that residents requested to be abandoned.

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

## 10.9 Other Major Environmental Issues and Actions

### Compliance with 10 CFR 850.

Albany has developed a program based on 10 CFR 850 to comply with the objectives of a chronic beryllium disease prevention program (CBDPP).

The program plan was issued in October 2005 and is being updated based on current beryllium area designations. A site inventory of the beryllium contaminations at the Albany site was completed in 2007, which showed several areas across the site to have residual beryllium concentrations above background levels (attributable to soils and building materials), as described in [Section 4.7](#). Remedial action planning is



occurring while protective health measures have been instituted, with remedial activities scheduled to commence in 2008.

Safety Analysis and Review System (SARS) Stand-Down. The Albany site instituted a stand-down in July 2007 to fully implement the NETL SARS program. Every research project, as well as facilities and support activities, were required to implement appropriate SARS documentation and inspection prior to resuming operations. Several projects were operational by the end of 2007, with the remainder of the projects working towards becoming operational as soon as practicable.

## **11 TULSA**

### **11.1 Site Description**

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

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

The City of Tulsa does not impose recycling requirements that would apply directly to office space lessees. Nevertheless, building management has arranged for various recycling activities throughout the office building complex. There were no citations for violations of ES&H laws, regulations, or ordinances in 2007.

### **11.2 Major Site Activities**

All facilities of the NETL office in Tulsa are located in The Williams Center, a downtown office building complex. The offices are leased by NETL from the Southwestern Power Administration (SWPA). In 2007, the Tulsa office undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the offices.

## **12 COMPLIANCE STATUS**

### **12.1 Environmental Restoration and Waste Management**

The Tulsa office had no offsite remediation activities, no onsite CERCLA/SARA cleanups, and no spills or leaks from facilities or operations that were ongoing during 2007. There were no National Priorities List (NPL) sites for which NETL-Tulsa had liability under CERCLA/SARA. There were no cleanups or surveillance activities for

leaks or spills that occurred in prior years or other activities that would lead to RCRA cleanups.

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

## 12.2 National Environmental Policy Act (NEPA)

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 NEPA compliance officer for a determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2007, all funded projects were determined to be categorical exclusions.

## 12.3 Toxic Substances Control Act (TSCA) and Federal Insecticide, Fungicide, Rodenticide Act (FIFRA)

Tulsa housed no TSCA-regulated substances, and no restricted-use pesticides, herbicides, or defoliant were kept within the offices in 2007 or any other years. The landlord and building management organization provide pest control services and grounds keeping services.

## 12.4 Radiation Protection

### 12.4.1 Ionizing Radiation Program.

There are no ionizing radiation sources at Tulsa.

### 12.4.2 Laser Program

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

## 12.5 Air Quality and Protection Activities

Because it is strictly an administrative office, Tulsa has no air quality protection program and no emissions that require monitoring, reporting, or permits. In 2007 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 related to the phase out of ozone depleting substances at Tulsa.

## 12.6 Water Quality and Protection Activities

The building landlord and the landlord's building management contractor deal with sewer use permits and storm water runoff control and permits. It is assumed that the level of impact on surface water has been about the same as for other office complexes in the region. Tulsa office activities in 2007 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies. In 2007, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards. Tulsa's water supply comes from the municipal water distribution network.

## 12.7 EO 13423 -- Strengthening Federal Environmental, Energy, and Transportation Management

This EO requires federal agencies to implement an EMS. However, as previously discussed, the Tulsa office engages in minimal ES&H activities. The office consists of one floor of leased space inside an office building complex. Onsite ES&H activity 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. 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 may be considered in the future. Tulsa does not have a formal pollution prevention program; however, staff members are involved through activities described under the Pollution Prevention Program above.

Tulsa's electricity costs are included in the rent. Lights and air conditioning are governed by a building energy management system that uses timers, which are on

between 6:00 am and 6:00 pm and off at night, on weekends, and on holidays. Windows in the building are tinted and sealed, further reducing the need for cooling. Energy efficient lighting has replaced conventional bulbs, and the staff buys Energy Star<sup>®</sup> products when the opportunity arises. Although there is no formal energy efficiency training in place for the Tulsa staff, they receive informal education through the use of posters throughout the office, and there are containers for recyclables in their offices.

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

#### 12.8 Groundwater and Soil Quality Protection Activities

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

#### 12.9 Other Major Environmental Issues and Actions

Tulsa is not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of any compliance agreements or cleanup agreements or any unresolved compliance issues. There were no audits conducted in 2007 under the sponsorship of DOE Headquarters.

## 13 FAIRBANKS

### 13.1 Site Description

NETL's Arctic Energy Office sponsors research on a variety of oil-and-coal related subjects. Alaska holds about one-fifth of America's remaining proved oil reserves, a significant portion of its natural gas reserves, and over one-half of its coal resources. Despite Alaska's energy wealth, there are many challenges to producing and delivering those resources to the rest of the United States, as well as providing affordable power to Alaska's rural villages. NETL is working with industry, academia, and other Government agencies to maximize the value of Alaska's fossil fuel resources while maintaining the pristine environment in which it is contained.

NETL's Arctic Energy Office in cooperation with the University of Alaska supports the *Tundra Lakes Water Withdrawals Project*, which is measuring the potential impacts of pumping water from arctic lakes to be used for constructing ice road.



Under a cooperative agreement with British Petroleum, NETL is working to determine the commercial viability of gas hydrates and associated free gas resources in three areas of the Alaska North Slope. NETL is sponsoring a study to determine the economic feasibility of siting a coal-based gasification plant in the Cook Inlet region for the co-production of electric power and products (e.g., gas, diesel, and ammonia fertilizer) using Buluga coal.

NETL continues to support a series of basin-oriented CO<sub>2</sub>-enhanced oil recovery studies.

In 2007, NETL prepared the release of a detailed assessment and analysis of North Slope oil and gas resources and the interrelated technical, economic, and environmental factors controlling future development of those resources. In partnership with Argonne National Laboratory, the University of Alaska, and NETL, a unique chemically-bonded phosphate ceramic borehole cement was developed to keep the permafrost frozen and undisturbed during subsequent production of oil and gas. NETL is supporting a coal gasification study to be released soon that is aimed at determining the economic feasibility of siting a coal-based gasification plant in the Cook Inlet region of Alaska for the co-production of electric power and marketable by-products. NETL is also supporting the following projects: Alaskan coalbed natural gas; solid oxide fuel cell systems; a Village of Galena electric power situational analysis; and two Alaskan natural gas pipeline spurs.

The Fairbanks office is in space rented by GSA on behalf of NETL. The Small Business Administration and Army Corps of Engineers are located in the same building, and the space is inspected annually by GSA to ensure the building complies with all government requirements, including local codes. In 2007, Fairbanks

undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the office. Any significant new environmental impacts would be associated with offsite projects supported or funded through the Fairbanks office. As further noted in section 14.4 each project is reviewed independently by NETL for its potential environmental impact before the project is undertaken.

### 13.2 Environmental Compliance

The Fairbanks office currently houses a single federal employee. Because of the nature of the work (contracts administration, inter-agency and inter-governmental coordination, and industry outreach), the waste management services are minimal and are provided by the landlord under the terms of the rental agreement.



The Fairbanks office is not required to implement an environmental compliance program. It has never formally implemented a pollution prevention program. The staff practices affirmative procurement whenever possible in Fairbanks (i.e., the procurement of goods containing recycled content or having less life-cycle impact on the environment). There is no formal recycling program within the Fairbanks community. However, the staff does contribute to the local recycling efforts when they are available. From August 2005 to January 2007 the Fairbanks North-Star Borough sponsored a paper recycling program that converted waste paper into pellets. The pellets were then used as a substitute fuel for coal in a power plant at the Eielson Air Force Base. Unfortunately, on January 18, 2007, the pelletizer that was used to shred paper and form it into pellets caught fire and was destroyed. As a consequence, paper recycling in the community was suspended for the remainder of 2007, and it is unclear when, or if, such recycling efforts will be revived because of the cost associated with the program.

The Army Corps of Engineers, located adjacent to the Arctic Energy Office, has arranged for a local job training center for disadvantaged youth to pick-up spent toner cartridges for local recycling. The Arctic Energy Office has joined in this program and provides its spent cartridges to the same organization.

### 13.3 National Environmental Policy Act (NEPA)

NETL-Fairbanks requires NEPA reviews for proposed offsite actions. These actions typically involve contract awards to other governmental organizations, educational institutions, and private industry. Project proponents fill out a questionnaire addressing the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. The completed questionnaire is then reviewed by NETL's NEPA compliance officer for a



determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2007, all Fairbanks-funded projects were determined to fall within the level of categorical exclusions.

#### 13.4 EO 13423 Strengthening Federal Environmental, Energy, and Transportation Management

NETL-Fairbanks engages in minimal ES&H activities. The office consists of approximately 2,000 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 Fairbanks into the NETL EMS may be considered at some time in the future if an increase in staff warrants it.



#### 13.5 Other Major Environmental Issues and Actions

Fairbanks staff members are not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of compliance agreements or cleanup agreements, nor were there any unresolved compliance issues. There were no audits conducted in 2007 under the sponsorship of DOE Headquarters, independent regulators, or other independent third parties. GSA conducted an annual inspection of the facility to ensure that safety equipment, bathroom facilities, ventilation, and elevators were maintained in a safe working condition and to verify that no hazardous materials were stored inappropriately anywhere in the building.

# **APPENDIX**

Acronyms

ACHD	Allegheny County Health Department
AEO	Arctic Energy Office (Fairbanks)
AFV	Alternative Fuel Vehicle(s)
AIS	Assessment Information Input System
ASER	Annual Site Environmental Report
B-	Building
BMS	Building Management System
CBT	Computer-Based Training
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	U.S. Code of Federal Regulations
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ES&H	Environment, Safety, and Health
FE	Office of Fossil Energy
FEMP	Federal Emergency Management Program
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GPDU	Gas Process Development Unit
GSA	U.S. General Services Administration
HVAC	Heating, Ventilation, and Air Conditioning
ISM	Integrated Safety Management
ISO	International Organization for Standardization
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
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
REC	Renewable Energy Credits
SARA	Superfund Amendments and Reauthorization Act
SARS	Safety Analysis and Review System
SPS	Small Purchase System
sq. ft.	Square Feet
SWPA	Southwestern Power Administration
TMDL	Total Maximum Daily Loading
TPH	Total Petroleum Hydrocarbons
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
VOC	Volatile Organic Compound
WVDEP	West Virginia Department of Environmental Protection
WWTF	Wastewater Treatment Facility

**Table 1.1 ES&H Programs**

Affirmative Procurement Advocate/Greening Acquisition Program
Air Quality Program
Alarms Oversight Program
Asbestos and Lead Abatement Program
Authority Having Jurisdiction (AHJ)/ Exemptions Program
Automatic Information Input System (AIIS) System Program
Automatic Information Input System (AIIS) Program
Beryllium Program
CAIRS Program (Injury/Illness Reporting)
Chemical Handling Facility
Chemical Hygiene Program
Chemical Inventory and MSDS Program
Confined Space Program
Construction and Maintenance Safety Program
Cryogenic Safety Program
Electrical Safety Program
Emergency Program
Emergency Preparedness Program/ Emergency Response Program
Environmental Management System (EMS) and Safety Management System (SMS) - Management Review Program
Environmental Program
Ergonomics Program
ES&H Communications Program
Records Program
R&D Projects Program
ES&H Training Program
Facility and Area Custodian Program
Facility Work Authorization Program (SOD)
Facility Safety Committee Program
Directives Program
Workers' Compensation Program
Fire Protection Program
Fire Warden Program
Ground-Water Quality Program
Hazard Communication Program
Hazardous Waste Program
Hearing Conservation Program
Illumination Quality Program
Inactive Waste Sites/Off-Site Remediation Program
Indoor Air Quality and Ventilation Program

Industrial Hygiene Program  
Industrial Wastewater Quality Program  
Laser Safety Program  
Lessons Learned Program  
Life Safety Program  
Medical Monitoring Program  
NEPA Compliance Officer  
Non-RCRA Waste Program  
Occupational Medicine Program  
Occurrence Reporting and Processing System (ORPS) Program  
Organization Incident Reporting Program  
OSHA Safety Program  
Radiation Safety Program  
Respiratory Protection Program  
Safety & Health Program  
SARA Title III Program  
SARS Program  
Soil Quality Program  
Storage Tank Program  
Surface-Water Quality Program  
Waste Management Oversight Program  
Waste Minimization and Pollution Prevention Program  
Water Quality Program  
Worker Protection Program

**Table 3.3 NETL 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: Industrial Wastewater Treatment Facility Operations and Discharges  
 Aspect 5: Air Emissions  
 Aspect 6: Raw Materials Usage (Increasing Green Purchasing)  
 Aspect 7: Non-Industrial Land Use  
 Aspect 8: Accident/Incident Rates  
 Aspect 9: Corrective Action Management

**Table 3.4.1 Objectives and Targets – Pittsburgh and Morgantown**

ES&H Management Plan	Objective/Target	Baseline	Target
			Actual
<b>Aspect 1 – Waste Generation, Management, and Disposal</b>			
1.1 Nonhazardous Waste Generation	Reduce the amount of nonhazardous waste generated by 75% by 2010 based on 1993 baseline (641 metric tons) (EO 13423, Sec 2.e)	641 metric tons	179 (72%) 157 (76% reduction)
1.2 Hazardous Waste Generation	Reduce routine hazardous wastes generated by 90% reduction by 2010, using the 1993 baseline (18.46 metric tons) (EO 13423, Sec 2.e)	18.46 metric tons	2.58 (86%) 1.23 (93% reduction)
1.3 Recycling	Increase recycling of sanitary waste streams to 50% by 2010 based on the 2002 baseline (31%) (EO 13423, Sec 2.e)	31%	47% 53%
<b>Aspect 2 – Energy and Fuel Use</b>			
2.1 Energy Use	Reduce energy usage/square foot by 3% percent annually through the end of fiscal year 2015 based on the 2003 baseline. (EO 13423, Sec. 2.a)	193,568 btu/sq ft	187,761 (3.0%) 171,123 (12%)
2.2 Renewable Energy	Ensure the use of statutorily required renewable energy consumed is 50% or greater (EO 13423, Sec 2.b)		50% 0%
2.3 Petroleum Fuels	Reduce the vehicle fleet's total consumption of petroleum products by 2% annually through the end of fiscal year 2015 based on 2006 baseline (EO 13423, Sec. 2.g)	20,021 gallons	19,621 (2.0%) 12,181 (39.1%)
2.4 Alternative Fuels	Increase the total fuel consumption that is non-petroleum-based by 10% annually based on 2006 baseline. (EO 13423, Sec 2.g)	21,546 gallons	23,701 (10.0%) 17,513 (18.7%)

<b>Aspect 3 – Hazardous Materials Procurement, Consumption, and Storage</b>			
3.1 Chemical Inventory	Reduce the quantity of toxic and hazardous chemicals and materials, acquired, used and disposed of. (EO13423, Sec. 2.e)	Determine the baseline	
<b>Aspect 4 – Industrial Wastewater Treatment Plant Operations</b>			
4.1 Notices of Violation (NOVs)	Maintain the number of NOV's issued to the WWTF at zero through 2010. (NETL - NOVs from Pleasant Hills)	0	0
			0
<b>Aspect 5 – Air Emissions</b>			
5.1 Class 1 Refrigerants	Eliminate use of Class I refrigerants by year 2010, to the extent economically practicable and to the extent that safer alternatives are available (baseline inventory = 190 lbs in 2002) (Clean Air Act)	190	70
			76
5.2 Greenhouse Gases	Reduce greenhouse gas emissions attributed to facility use through life-cycle cost effective measures by 30% by 2010, using 1990 as a baseline (67.4 million lbs)	67,400,000 lbs.	49,202,000 lbs. (27%)
			81,651,280 (121%)
<b>Aspect 6 – Green Purchasing</b>			
6.1 Purchase of Electronic Products	Increase the purchase of electronic products to that meet 95 percent of Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product, unless there is no EPEAT standard for such product (EO 13432, Sec. 2.h)	Determine the baseline	Establish process
<b>Aspect 7 – Non-Industrial Land Use</b>			
7.1 Wildlife Management	Reduce the deer population at the PGH and MGN sites in 2007 and implement a Wildlife Management Program in 2008. (NETL - Deer Population Problem)	PGH: <50 MGN: <5	PGH: <50 MGN: <5
			PGH: 23 MGN: 12
<b>Aspect 8 - Accidents/Incident Rates</b>			
8.1 Recordable Case Rate	Reduce recordable case rates to a level of 1.5 in 2007. (FE ESS&H Commitment to ESS&H)		1.5
			2.52
8.2 Lost Workday Case Rate	Reduce the lost workday case rate to a level of 0.6 in 2007. (FE ESS&H Commitment to ESS&H)		0.6
			0.32
8.3 Safety and Health Cost Index	Reduce the safety and health cost index to a level of 3. (FE ESS&H Commitment to ESS&H)		3
			17.09
8.4 Construction Safety	Reduce the accident and incident rate of all off-site construction contractors working at the NETL sites. (NETL - Management Concern)		0
			0
<b>Aspect 9 - Corrective Action Management</b>			



9.1 Management of Urgent Corrective Actions	Increase the number of urgent corrective actions completed on time to 100%. (NETL - Management Concern)	100%
		75%
9.2 Management of Serious Corrective Actions	Increase the number of serious corrective actions completed on time to 75%. (NETL - Management Concern)	75%
		88%



Objective/Target Was Met in 2007



Objective/Target Was Not Met in 2007

<b>Table 3.4.2 Objectives and Targets – Albany</b>			
ES&H Management Plan	Objective/Target	Baseline	Target
			Actual
<b>Aspect 1 – Energy and Resource Usage</b>			
Alternative Fuels	Convert or replace 50% of all propane internal combustion powered materials handling equipment to electric by the end of FY 2006 and 100% by the end of FY 2006.	0%	100%
			100% (closed)
Energy Use	Reduce energy consumption to meet DOE Order Number 430.2A (04/15/2002) and conform to Executive Order 13123. The requirement is to reduce energy consumption per square foot by 25% by 2010.	77, 343 Btu/GSF	58, 007 Btu/GSF
			56, 267 Btu/GSF
<b>Aspect 2 – Legacy Contamination</b>			
Beryllium	Identify and Remediate Beryllium Contamination by the end of fiscal year 2009.		
Groundwater	Identify sources of potential groundwater contamination and remediate groundwater to meet the satisfaction of the Oregon Department of Environmental Quality (DEQ) by 2016.		
Lead	Complete Center-wide abatement of Exterior building surfaces' lead based paints by end of FY 2004.		All surfaces
			Level 2 surfaces only done.
<b>Aspect 3 – Atmospheric Emissions and Particulates</b>			
Particulate Emissions	Install new or upgraded particulate control devices to operations having the potential for producing significant particulate emissions.	28	28
			27 (96%)



Objective/Target Was Met in 2007



Objective/Target Was Not Met in 2007

Table 4.4.a Radioactive Materials Inventory – Morgantown

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	10 mCi 03/01/04	Analyzer S/N 787AN, cell serial #2103, Molecular Analytics, Inc.	B3 150
Sc-46	0.065 mCi 7/01/90	University of Missouri	B-16, Radioactive Material Storage Cabinet
Sc-46	0.046 mCi 2/12/91	University of Missouri	B-16, Radioactive Material Cabinet
Ra-226	9 uCi 1/56	Model #B-5, Serial #11205, Mettler Corp.	B-25, Room 206
Ra-226	21 uCi 1/56	Model #M-5, Serial #17032, Mettler Corp.	B-25, Room 112
Ra-226	9 uCi 1/56	Model #B-5 GD, Serial #13805, Mettler Corp.	B-3, Area 150
Phosphate Rock	Consumer Product	Model #1080, Sun Nuclear Corp.	B-16, Radioactive Material Cabinet
H-3	20 Ci 5/94	Model #B100/U10, Serial #575263, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574434, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574435, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574436, SRB Technologies	B-33
Co-57	12 mCi 12/95	Model #IPL CUS, Serial #EE661, Isotope Products Lab	B-16, Industrial Hygiene Laboratory
Cs-137	1 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Cs-137	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	10 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Tl-204	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Tl-204	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Cd-109	10 mCi 5/04	Model #XFB3205, Serial #NR2032, IPL Inc.	B-33
Po-210	5mCi 09/06	P-2042 cell serial #A2FH133 NRD, Inc.	B13 diesel test cell

**Table 4.4.b Radioactive Sealed Sources in Use -- Pittsburgh**

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

**Table 4.4.c X-Ray Radiation Generating Devices – Pittsburgh**

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

**Table 4.6.1 EPAAct05 Mandated Energy Intensity Reductions & Renewable Electric Procurement**

Fiscal Year	NETL's Energy Reduction Goal	EPAAct05 Goals	Federal Goals for Procurement of Renewable Electric Energy	NETL's EPAAct05 Goal Status for Renewable Electric Procurement
2003	Base Year	4.0%	N/A	N/A
2007	34.0%	4.0%	3.0%	8.9%
2008		6.0%	3.0%	8.9%
2009		8.0%	3.0%	8.9%
2010		10.0%	5.0%	8.9%
2011		12.0%	5.0%	8.9%
2012		14.0%	5.0%	8.9%
2013		16.0%	7.5%	8.9%
2014		18.0%	7.5%	8.9%
2015		20.0%	7.5%	8.9%

**Table 4.11.a Summary of Permits – Morgantown**

Permit Number and Name	Issue Date Exp. Date	Regulatory Agency	Description
MUB 012 Industrial Wastewater Discharge Permit	07/01/2005 to 06/30/2010	MUB	This permit allows for the operation of wastewater pretreatment facilities and discharge into the MUB's sanitary sewer system. It sets discharge limits and monitoring requirements, compliance with the Morgantown Industrial Waste Ordinance, reporting requirements including accidental discharge reporting, and testing procedures.
WV0111457 General WV/National Pollutant Discharge Elimination System (NPDES) Storm Water Permit	04/01/2004 to 03/31/2009	WVDEP, Office of Water Resources	This general permit covers storm water associated with industrial activity. It identifies activities that are covered by the permit and the associated monitoring and analysis requirements for each. Also discussed are the Storm Water Pollution Prevention Plan and Groundwater Protection Management Plan required by the permit.
WVG610042 Registration Permit for General WV/NPDES Storm Water Permit	12/07/2004 to 03/31/2009	WVDEP, Office of Water Resources	The general permit registration allows NETL to operate under permit WV0111457, above. The registration establishes the schedule for submission of discharge monitoring reports, as well as discussions on monitoring, sampling, and analysis requirements. This registration makes the general WV permit applicable to NETL.

**Table 4.11.b Summary of Permits – Pittsburgh**

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
7023056-000-00800. A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit	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.

Table 4.11.b Summary of Permits – Pittsburgh

Permit No. Expiration Date	Permit Type	Regulatory Agency	Description
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 10/04/2007	Aboveground Storage Tank Registration	PADEP	Permit for tank containing ferric chloride.
02-81183009A 10/04/2007	Aboveground Storage Tank Registration	PADEP	Permit for tank containing caustic soda.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground gasoline storage tank.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground diesel fuel storage tank.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground No. 2 fuel oil storage tank.
S-1018	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground ethanol storage tank.
S-1102	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground gasoline storage tank.
S-1102	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an aboveground diesel fuel storage tank.
PAA-070566	Asbestos	ACHD	Asbestos Abatement Permit for B-920.

Table 4.14 Surveillance Monitoring – Pittsburgh and Morgantown

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, and facilities
Transformer inspection (MGN)	EG&G	Visual assessment of oil-filled transformer	Regulatory compliance	Daily	Site-wide
Transformer inspection (PGH)	SAIC	Visual assessment of oil-filled transformer	Regulatory compliance	Weekly	Site-wide
Storage tank inspection (MGN)	EG&G	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Interstitial storage tank monitoring (MGN)	EG&G	Interstitial monitoring of dual-wall tanks	SPCC plan compliance, regulatory compliance	Quarterly	B29, B36, Navy facility fuel storage tanks
Storage tank inspection (PGH)	SAIC	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Radiation gauge survey	Parsons	Leak test of radiation sources	Regulatory compliance	Semi-annual	At radiation sources, B-84
Safety observer inspection (PGH)	EG&G	Visual inspections of work-sites	Contractor ISM observance, operational control	Semi-annual	Site-wide
Water usage (PGH)	Site Operations Division	Document water usage	Operational	Daily	B-83, 84, 93, 94, chillers, boiler house
Backup generators (PGH)	SAIC	Backup generator inspection	Operational	Weekly	Site-wide
Chemical handling facility (PGH)	EG&G	CHF operations inspection checklist	Operational	Daily	B-64, B-91, B-92

**Table 6.1.1 Potential Contamination Sources and Cleanup Actions -  
Morgantown**

<b>Potential Source</b>	<b>Potential Contamination</b>	<b>Current Status</b>
Underground Storage Tanks	BTEX	All tanks removed 1991 or before.
42-Inch Coal Gasifier	Coal tar, polynuclear hydrocarbons, BTEX	Gasifier removed; soil removed to a depth of 10 feet in 1994.
Stretford Pad	Stretford solution (vanadium and cadmium compounds)	Pad removed; soil removed to a depth of 10 feet in 1994.
Wastewater Pond 001	Coal tar, polynuclear hydrocarbons, BTEX, metals	Removed in 1995; site filled and re-graded.
Wastewater Pond 002	Coal tar, polynuclear hydrocarbons, BTEX, metals	Removed in mid-1980s.
Wastewater Pond 005	Coal tar, polynuclear hydrocarbons, BTEX, cyanide, metals	Removed in 1985; backfilled and paved as a parking lot.
Contaminated Sewer Lines	Mercury	Removed the contaminated portion of the lines which was from B-1 to a point east of B-3. The line from B-3 to Burroughs Run was left in place and is still being used as the major storm water drainage line for the site. This is a 15" vitrified tile line that discharges to Burroughs Run at the 002 outfall.
Underground process lines used to convey contaminated process water from the old 42" fixed-bed gasifier and/or B-4 to an activated carbon treatment system and Pond 005.	Coal tar, polynuclear hydrocarbons	Capped and abandoned in place. They were/are not part of any NETL sewer system (i.e., storm, sanitary, or contaminated).

Table 6.1.2 Properties of Potential Contaminants

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



<b>Table 6.1.3 Hazardous Waste Generation -- Morgantown</b>		
<b>Waste Stream</b>	<b>Quantity Generated (lbs)</b>	<b>Quantity Shipped (lbs)</b>
Poison (Toxic solids & Liquids)	27	27
Mercury/Mercury Compounds	19	19
Waste Corrosive Liquids	132	132
Waste Solvents/Flammable Liquids	231	231
Waste Oxidizers	2	2
Flammable Solids	21	21
Photo lab water/Heavy Metal waste solutions	8	8
Other RCRA Compounds	18.5	18.5
Fluorescent Light Tubes (Universal Waste)	515	515
Batteries (Universal Waste)	2,728.5	2,728.5
<b>TOTAL</b>	<b>3,702</b>	<b>3,702</b>

<b>Table 6.5 Air Emission Permits – Morgantown</b>							
<b>Permits</b>	<b>Status</b>	<b>Exceedance</b>	<b>NOVs</b>	<b>Sources</b>	<b>Pollutants</b>	<b>Emissions</b>	<b>Criteria</b>
R13-1768 and 061-00064	Expired	None	None	Minor emission sources, GPDU	None	None	1440 hours operation per year when permit was active.

<b>Table 6.6.1.a NPDES Permit Storm Water Monitoring Requirements -- Morgantown</b>			
<b>Outfall</b>	<b>Pollutants of Concern</b>	<b>Low Concentration Cutoff Waiver</b>	<b>Frequency</b>
002	Nitrite and Nitrate Fecal coliform	0.68 mg/l	6 month 6 month
005	Total suspended solids Fecal coliform	100 mg/l	6 month 6 month
010	BOD Total suspended solids Ammonia Fecal coliform pH COD Oil and grease	30 mg/l 100 mg/l 4 mg/l Report only 9 120 15 mg/l	6 month 6 month 6 month 6 month 6 month 6 month 6 month

<b>Table 6.6.1.b NPDES Storm Water Analysis Results -- Morgantown</b>							
<b>Constituents</b>	<b>Low Conc. Cutoff Waiver</b>	<b>Outfall 002</b>		<b>Outfall 005</b>		<b>Outfall 010</b>	
		<b>4/11/07</b>	<b>10/9/07</b>	<b>4/11/07</b>	<b>10/9/07</b>	<b>4/11/07</b>	<b>10/9/07</b>
Nitrate + Nitrite (Grab)	0.68 mg/L	ND	0.94 mg/L	NS	NS	NS	NS
Ammonia (Grab)	4 mg/L	NS	NS	NS	NS	ND	ND
Fecal Coliform (Grab)	---	260 col/100mL	5350 col/100mL	950 col/100mL	>6000 col/100mL	440 col/100mL	>6000 col/100mL
Total Suspended Solids (Grab)	100 mg/L	NS	NS	30 mg/L	5 mg/L	231 mg/l	126 mg/l
BOD	30 mg/l	NS	NS	NS	NS	5.2 mg/l	3.4 mg/l
pH	9	NS	NS	NS	NS	7.7	7.3
COD	120 mg/l	NS	NS	NS	NS	ND	51 mg/l
Oil & Grease	15 mg/l	NS	NS	NS	NS	ND	ND

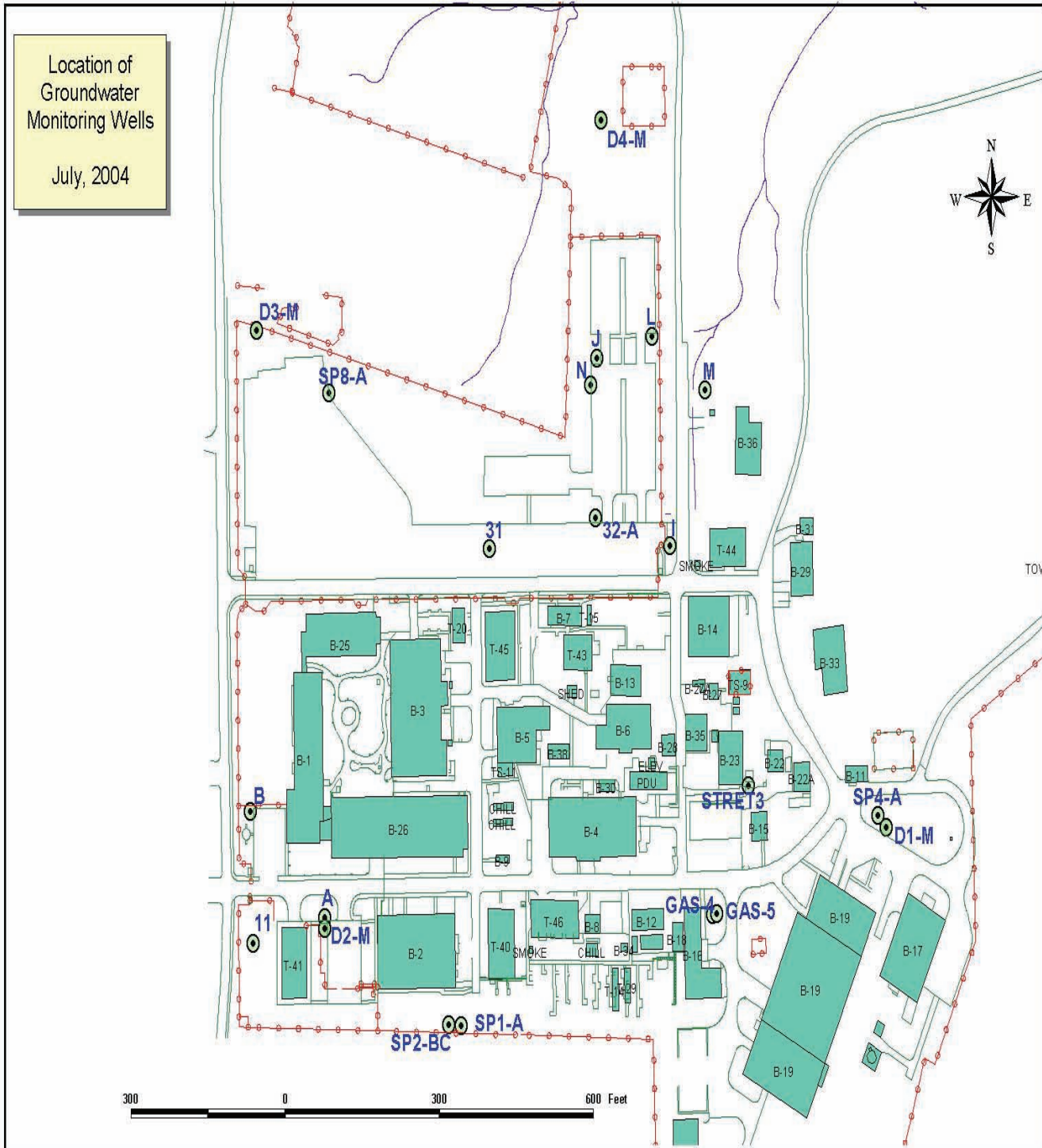
NS = Not Sampled; ND = Not Detected

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

Parameter	Limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (MGD)													
Monthly Avg	0.09	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Daily Max	0.15	0.03	0.03	0.06	0.04	0.06	0.02	0.06	0.05	0.04	0.03	0.02	0.06
BOD5													
Monthly Avg	None	ND	0.2	1.2	0.2	0.3	0.2	0.4	ND	0.4	0.2	0.1	0.3
Daily Max	None	ND	0.5	3.7	0.7	1.7	0.3	2.7	ND	1.7	0.6	ND0.3	1.6
TSS													
Monthly Avg	None	ND	ND	ND	0.7	ND	ND	ND	ND	1.1	ND	0.3	0.6
Daily Max	None	ND	ND	ND	2.7	ND	ND	ND	ND	4.4	ND	0.9	3.4
Arsenic													
Monthly Avg	0.005	ND	ND	ND	0.0002	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.008	ND	ND	ND	0.0007	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium													
Monthly Avg	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	0.002	0.001	0.003	0.0007	0.001	0.001	0.003	0.01	0.01	0.003	0.001	0.001
Daily Max	0.06	0.005	0.004	0.009	0.002	0.002	0.002	0.02	0.03	0.02	0.01	0.003	0.005
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	0.001	ND	0.0003	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.038	ND	0.0008	0.002	ND	0.001	ND	ND	ND	ND	ND	ND	ND
Mercury													
Monthly Avg	0.0006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.0009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel													
Monthly Avg	0.01	0.0004	0.0002	0.001	ND	0.0002	0.0002	0.0002	0.0002	0.0002	ND	0.0003	0.0002
Daily Max	0.015	0.0001	0.0005	0.002	ND	0.001	0.0003	0.001	0.0004	0.0007	ND	0.0005	0.001
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	0.01	0.01	0.03	0.005	0.01	0.01	0.01	0.01	0.01	0.003	0.007	0.007
Daily Max	0.3	0.02	0.02	0.08	0.015	0.05	0.02	0.03	0.03	0.02	0.01	0.01	0.03
Iron													
Monthly Avg	None	0.03	0.06	0.11	0.01	0.03	0.01	0.06	0.03	0.01	0.01	0.05	0.02
Daily Max	None	0.09	0.18	0.32	0.04	0.19	0.02	0.33	0.08	0.06	0.02	0.10	0.15
Manganese													
Monthly Avg	None	0.01	0.02	0.05	0.02	0.02	0.001	0.01	0.01	0.02	0.05	0.02	0.01
Daily Max	None	0.03	0.05	0.15	0.05	0.12	0.002	0.03	0.03	0.07	0.16	0.04	0.25
Phenolics													
Monthly Avg	None	ND	0.004	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	None	ND	0.013	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Halogens													
Monthly Avg	None	0.003	0.005	0.011	0.003	0.003	0.005	0.036	0.005	0.003	0.003	0.003	0.003
Daily Max	None	0.008	0.014	0.033	0.008	0.017	0.010	0.215	0.013	0.012	0.010	0.006	0.016
Organics													
Alachlor-1254	None	NS	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS
All others	None	NS	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS
pH (s.u.)													
Minimum	6.0	6.7	6.2	6.4	7.1	6.3	7.3	7.1	7.2	7.3	7.4	6.9	7.6
Maximum	9.0	8.0	7.7	7.6	7.9	7.8	7.9	7.8	7.6	7.9	7.8	8.5	8.8

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

Figure 6.7.1 Active Monitoring Wells at the Morgantown Site



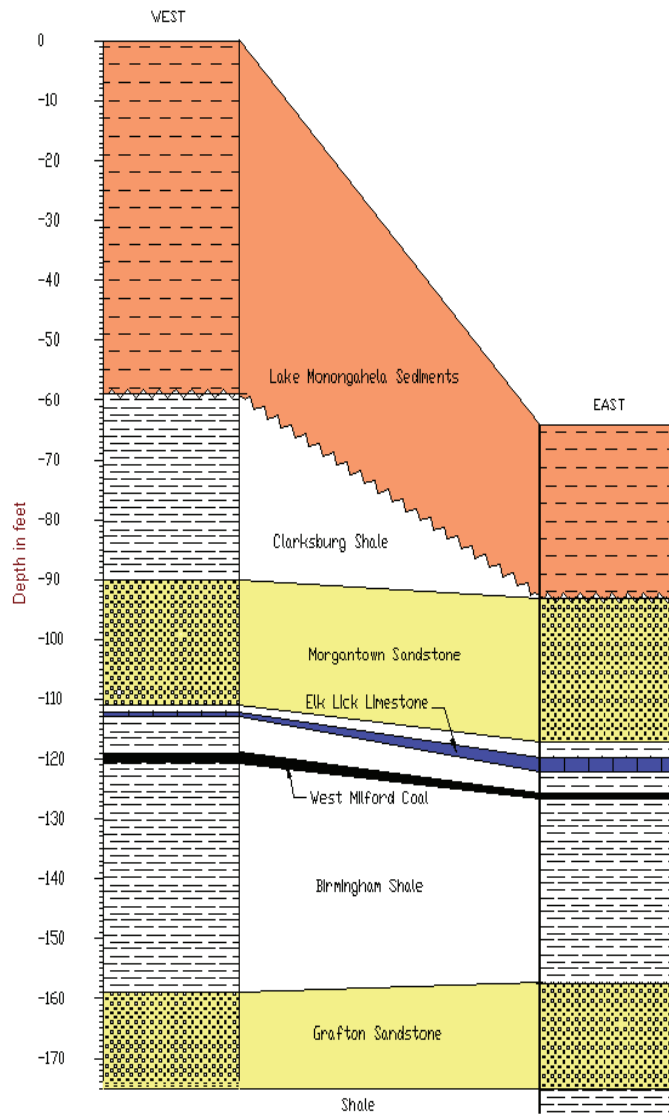
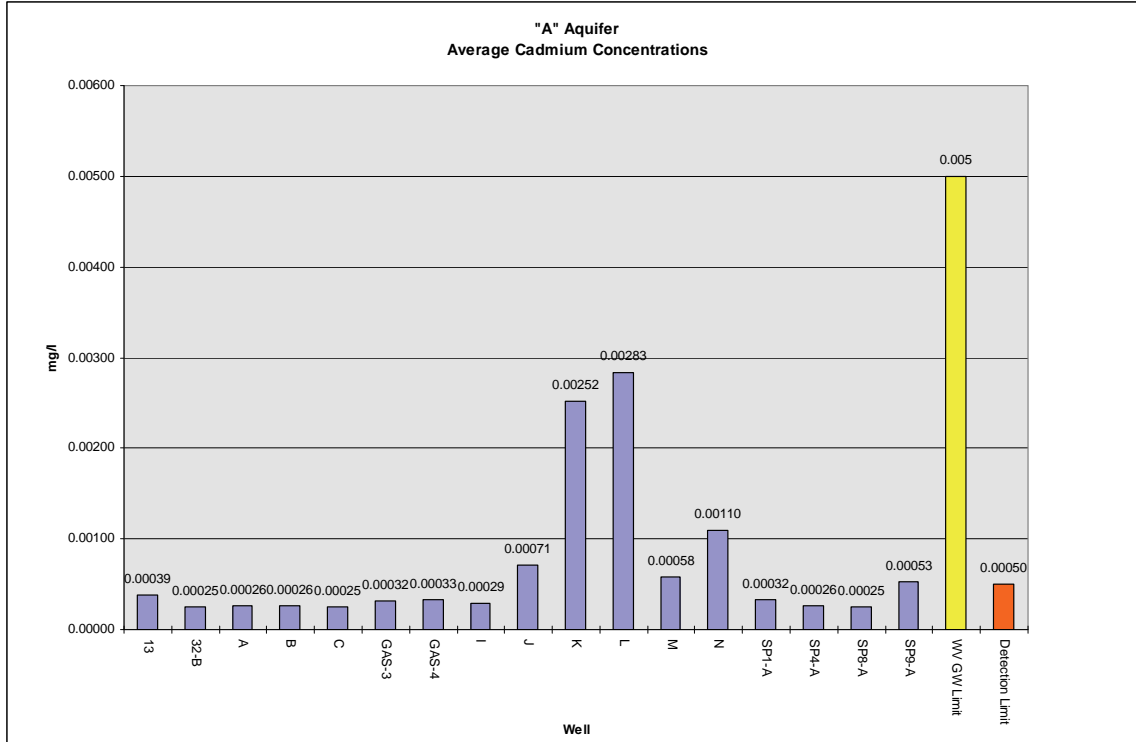


Figure 6.7.2 Generalized cross-section of aquifer units at the Morgantown site.



**Figure 6.7.3 Average cadmium concentrations in wells, “A” Aquifer, Lake Monongahela unconsolidated sediments -- Morgantown.**

**Table 6.7.1.a March 2007 Groundwater Data for "A" Aquifer --  
Morgantown**

PARAMETER	Sample Location														
	MDL	UNITS	A	B	SP1-A	SP4-A	SP8-A	SP9-A	I	J	K	L	M	N	GAS-4
Benzene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Ethylbenzene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Toluene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Total Xylenes	15	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Benzo(a)pyrene	10	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Arsenic	0.001	mg/l	ND	ND	ND	ND	P&A	P&A	0.0046	ND	P&A	ND	ND	ND	ND
Cadmium	0.001	mg/l	ND	ND	ND	ND	P&A	P&A	ND	0.0011	P&A	0.0020	0.0008	0.0017	ND
Chloride	1	mg/l	0.72	1.1	6.7	36.9	P&A	P&A	17.6	259	P&A	641	55.9	266	571
Chromium	0.002	mg/l	ND	0.0032	0.0031	ND	P&A	P&A	0.0066	0.0026	P&A	0.0058	0.0015	ND	0.0074
Copper	0.002	mg/l	ND	0.0028	0.0026	0.0009	P&A	P&A	0.0073	0.0009	P&A	0.0083	0.0014	0.0012	0.0008
Cyanide	0.01	mg/L	0.0570	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Fluoride	1	mg/L	ND	ND	0.0160	0.0670	P&A	P&A	0.0200	0.0240	P&A	0.0720	0.1200	0.0620	0.0640
Iron	0.05	mg/l	27.20	36.00	41.40	1.11	P&A	P&A	30.10	0.68	P&A	3.51	1.76	1.74	11.10
Lead	0.001	mg/l	ND	0.0034	0.0030	ND	P&A	P&A	0.0077	ND	P&A	0.0045	ND	ND	ND
Manganese	0.0005	mg/l	1.3300	1.2300	1.8400	0.4730	P&A	P&A	0.5190	0.2820	P&A	0.1200	3.5700	0.6440	1.8800
Mercury	0.0002	mg/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Nickel	0.001	mg/l	ND	0.0034	0.0026	0.0025	P&A	P&A	0.0052	0.0803	P&A	0.0894	0.0317	0.1080	0.0063
Nitrate Nitrogen	0.1	mg/L	ND	0.0230	ND	0.0180	P&A	P&A	ND	0.6900	P&A	0.5300	0.3100	0.5600	0.0870
pH (field)		S.U.	6.46	6.61	6.33	6.38	P&A	P&A	6.66	5.19	P&A	5.81	5.2	4.54	7.28
Silver	0.001	mg/l	ND	ND	0.0008	ND	P&A	P&A	ND	ND	P&A	0.0006	0.0011	ND	0.0006
Specific Conductance (field)		umhos	242	242	285	280	P&A	P&A	278	874	P&A	1849	388	910	262
Sulfate	1	mg/l	23.8	22.9	48.7	18.9	P&A	P&A	13.2	59.2	P&A	86.6	96.5	66.2	112.0
Temperature (field)		deg. C	14.8	14.8	14.7	15.9	P&A	P&A	14.9	14.5	P&A	13.3	11.2	14.6	15.5
Total Organic Halogen	0.0300	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	0.0900
Total Recoverable Phenolics	0.01	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Zinc	0.0200	mg/L	0.0071	0.0157	0.0134	0.0101	P&A	P&A	0.0220	0.1080	P&A	0.1000	0.0516	0.1940	0.0099

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

**Table 6.7.1.b August 2007 Groundwater Data for “A” Aquifer --  
Morgantown**

PARAMETER	Sample Location														
	MDL	UNITS	A	B	SP1-A	SP4-A	SP8-A	SP9-A	I	J	K	L	M	N	GAS-4
Benzene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Ethylbenzene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Toluene	5	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Total Xylenes	15	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Benzo(a)pyrene	10	ug/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Arsenic	0.001	mg/l	0.0024	0.0038	0.0024	ND	P&A	P&A	0.0059	ND	P&A	0.0068	ND	ND	0.0011
Cadmium	0.001	mg/l	ND	ND	ND	ND	P&A	P&A	ND	0.0011	P&A	0.0011	ND	0.0018	ND
Chloride	1	mg/l	1	1.2	7.5	34.7	P&A	P&A	13.8	280	P&A	146	50.3	321	193
Chromium	0.002	mg/l	ND	0.0047	0.0059	ND	P&A	P&A	0.0025	0.0044	P&A	0.0239	ND	ND	0.0073
Copper	0.002	mg/l	ND	0.0055	0.0061	ND	P&A	P&A	0.0028	ND	P&A	0.0434	0.0032	ND	ND
Cyanide	0.01	mg/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Fluoride	1	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Iron	0.05	mg/l	28.5	38	44.6	1.6	P&A	P&A	26.7	0.978	P&A	28.7	1.84	0.907	13
Lead	0.001	mg/l	ND	0.0039	0.0049	ND	P&A	P&A	0.0018	0.0029	P&A	0.0203	ND	ND	ND
Manganese	0.0005	mg/l	1.45	1.38	1.74	0.474	P&A	P&A	0.487	0.206	P&A	0.675	2.81	0.597	1.64
Mercury	0.0002	mg/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Nickel	0.001	mg/l	ND	0.0047	0.0044	0.0028	P&A	P&A	0.002	0.0742	P&A	0.0651	0.0317	0.106	0.0072
Nitrate Nitrogen	0.1	mg/L	ND	ND	ND	ND	P&A	P&A	ND	0.65	P&A	0.3	0.26	0.55	ND
pH (field)		S.U.	6.46	6.42	6.29	6.3	P&A	P&A	6.69	5.1	P&A	6.21	4.59	4.57	6.86
Silver	0.001	mg/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Specific Conductance (field)		umhos	272	250	313	311	P&A	P&A	303	925	P&A	656	384	1060	1611
Sulfate	1	mg/l	24.2	24.4	61.8	22.1	P&A	P&A	12.2	59.1	P&A	76.9	103	76	29.3
Temperature (field)		deg. C	16.5	17.7	15.7	17	P&A	P&A	16.1	15.5	P&A	17	18	14.4	17
Total Organic Halogen	0.03	mg/l	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Total Recoverable Phenolics	0.01	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	0.012	ND	0.018	ND
Zinc	0.005	mg/l	0.0054	0.025	0.0184	0.0096	P&A	P&A	0.0089	0.1	P&A	0.173	0.0543	0.18	0.0128

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged



**Table 6.7.2.a March 2007 Groundwater Data for “B-C” Aquifer --  
Morgantown**

PARAMETER	Sample Location							
	MDL	UNITS	11	SP2-BC	32-A	31	GAS-5	STRET-3
Benzene	5	ug/l	ND	ND	ND	ND	ND	NT
Toluene	5	ug/l	ND	ND	ND	ND	ND	NT
Ethylbenzene	5	ug/L	ND	ND	ND	ND	ND	NT
Total Xylenes	15	ug/L	ND	ND	ND	ND	ND	NT
Benzo(a)pyrene	10	ug/l	ND	ND	ND	ND	ND	NT
Arsenic	0.0100	mg/L	ND	ND	ND	ND	ND	NT
Cadmium	0.0050	mg/L	ND	ND	ND	0.0012	ND	NT
Chloride	1	mg/l	10.2	7.2	188	629	119	NT
Chromium	0.0050	mg/L	ND	ND	0.0087	ND	ND	NT
Copper	0.0250	mg/L	0.00097	0.0014	0.0067	0.0024	ND	NT
Cyanide	0.01	mg/L	ND	ND	ND	ND	ND	NT
Fluoride	0.0500	mg/L	0.0220	0.0810	0.0190	0.0880	0.1100	NT
Iron	0.1000	mg/L	30.00	0.30	7.34	ND	0.45	NT
Lead	0.0030	mg/L	ND	ND	0.0048	ND	ND	NT
Manganese	0.0150	mg/L	0.9770	0.0592	2.5900	1.1100	0.3550	NT
Mercury	0.0002	mg/L	ND	ND	ND	ND	ND	NT
Nickel	0.0400	mg/L	ND	ND	0.0399	0.0416	ND	NT
Nitrate Nitrogen	0.05	mg/L	0.0250	0.1300	0.3600	1.2000	0.1500	NT
pH (field)		S.U.	6.53	6.57	5.35	5.3	6.96	NT
Silver	0.0050	mg/L	ND	ND	ND	ND	ND	NT
Specific Conductance (field)		umhos	176	429	1994	666	794	NT
Sulfate	1.0000	mg/L	12.4	14.8	38.2	128.0	56.3	NT
Temperature (field)		deg. C	14.3	14.2	13.1	15.8	13	NT
Total Organic Halogen	0.0300	mg/L	ND	ND	ND	0.0634	ND	NT
Total Recoverable Phenolics	0.01	mg/L	ND	ND	ND	0.0092	ND	NT
Zinc	0.0200	mg/L	0.0143	0.0095	0.0478	0.0723	0.0091	NT

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

**Table 6.7.2.b August 2007 Groundwater Data for “B-C” Aquifer --  
Morgantown**

PARAMETER	Sample Location							
	MDL	UNITS	11	SP2-BC	32-A	31	GAS-5	STRET-3
Benzene	5	ug/l	ND	ND	ND	ND	ND	NT
Toluene	5	ug/l	ND	ND	ND	ND	ND	NT
Ethylbenzene	5	ug/L	ND	ND	ND	ND	ND	NT
Total Xylenes	15	ug/L	ND	ND	ND	ND	ND	NT
Benzo(a)pyrene	10	ug/l	ND	ND	ND	ND	ND	NT
Arsenic	0.001	mg/l	ND	ND	ND	ND	ND	NT
Cadmium	0.001	mg/l	ND	ND	0.0014	ND	ND	NT
Chloride	1	mg/l	9.5	8	710	234	77.6	NT
Chromium	0.002	mg/l	ND	ND	ND	0.007	ND	NT
Copper	0.002	mg/l	ND	ND	0.0022	0.004	ND	NT
Cyanide	0.01	mg/l	ND	ND	ND	ND	ND	NT
Fluoride	1	mg/L	ND	ND	ND	ND	ND	NT
Iron	0.05	mg/l	24	0.269	0.05	5.18	0.615	NT
Lead	0.001	mg/l	ND	ND	0.0012	0.0023	ND	NT
Manganese	0.0005	mg/l	0.884	0.0466	1.08	3.06	0.238	NT
Mercury	0.0002	mg/l	ND	ND	ND	ND	ND	NT
Nickel	0.001	mg/l	ND	ND	0.0413	0.0326	ND	NT
Nitrate Nitrogen	0.1	mg/L	ND	ND	0.95	0.3	0.37	NT
pH (field)		S.U.	6.45	6.48	5.06	5.06	6.71	NT
Silver	0.001	mg/l	ND	ND	ND	ND	ND	NT
Specific Conductance (field)		umhos	192	451	1979	949	649	NT
Sulfate	1	mg/l	11.6	17.6	122	42	42.3	NT
Temperature (field)		deg. C	16	15.4	17.3	12.2	18.5	NT
Total Organic Halogen	0.03	mg/l	ND	0.0611	ND	ND	ND	NT
Total Recoverable Phenolics	0.01	mg/L	0.017	ND	ND	0.012	ND	NT
Zinc	0.005	mg/l	0.0069	ND	0.065	0.0355	0.0066	NT

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

Table 6.7.3.a March 2007 Groundwater Data for Morgantown Aquifer

PARAMETER	Sample Location					
	MDL	UNITS	D2-M	D1-M	D3-M	D4-M
Benzene	5	ug/L	ND	ND	NT	ND
Toluene	5	ug/L	ND	ND	NT	ND
Ethylbenzene	5	ug/L	ND	ND	NT	ND
Total Xylenes	15	ug/L	ND	ND	NT	ND
Benzo(a)pyrene	9.6	ug/L	ND	ND	NT	ND
Arsenic	0.01	mg/L	ND	ND	NT	ND
Cadmium	0.0050	mg/L	ND	ND	NT	ND
Chloride	1	mg/l	1.5	17.4	NT	84.8
Chromium	0.0050	mg/L	0.0071	ND	NT	ND
Copper	0.0250	mg/L	ND	ND	NT	ND
Cyanide	0.01	mg/L	ND	ND	NT	ND
Fluoride	0.05	mg/L	0.5400	0.0410	NT	0.0920
Iron	0.1	mg/L	12.00	13.10	NT	1.41
Lead	0.0030	mg/L	0.0127	ND	NT	ND
Manganese	0.0150	mg/L	1.36	1.46	NT	0.08
Mercury	0.00020	mg/L	ND	ND	NT	ND
Nickel	0.0400	mg/L	ND	ND	NT	ND
Nitrate Nitrogen	0.05	mg/L	ND	ND	NT	0.8200
pH (field)		S.U.	9.4	6.61	NT	6.62
Silver	0.0050	mg/L	ND	ND	NT	ND
Specific Conductance (field)		umhos	510	378	NT	353
Sulfate	1.0	mg/L	0.84	39.30	NT	12.90
Temperature (field)		deg. C	14.4	15.4	NT	13.1
Total Organic Halogen	0.03	mg/L	ND	ND	NT	ND
Total Recoverable Phenolics	0.01	mg/L	ND	ND	NT	ND
Zinc	0.02	mg/L	0.0310	0.0301	NT	ND

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

**Table 6.7.3.b August 2007 Groundwater Data for Morgantown Aquifer**

PARAMETER	Sample Location					
	MDL	UNITS	D2-M	D1-M	D3-M	D4-M
Benzene	5	ug/l	ND	ND	NT	ND
Toluene	5	ug/l	ND	ND	NT	ND
Ethylbenzene	5	ug/L	ND	ND	NT	ND
Total Xylenes	15	ug/L	ND	ND	NT	ND
Benzo(a)pyrene	10	ug/l	ND	ND	NT	ND
Arsenic	0.001	mg/l	0.0164	0.0064	NT	ND
Cadmium	0.001	mg/l	ND	ND	NT	ND
Chloride	1	mg/l	1.3	19	NT	92.6
Chromium	0.002	mg/l	0.0163	ND	NT	ND
Copper	0.002	mg/l	0.0279	ND	NT	ND
Cyanide	0.01	mg/l	ND	ND	NT	ND
Fluoride	1	mg/L	ND	ND	NT	ND
Iron	0.05	mg/l	21.6	12.7	NT	0.709
Lead	0.001	mg/l	0.0173	ND	NT	ND
Manganese	0.0005	mg/l	0.853	1.51	NT	0.0349
Mercury	0.0002	mg/l	ND	ND	NT	ND
Nickel	0.001	mg/l	0.0316	0.0027	NT	0.0019
Nitrate Nitrogen	0.1	mg/L	ND	ND	NT	0.7
pH (field)		S.U.	9.12	6.59	NT	6.02
Silver	0.001	mg/l	ND	ND	NT	ND
Specific Conductance (field)		umhos	555	401	NT	363
Sulfate	1	mg/l	1.5	34.8	NT	12.8
Temperature (field)		deg. C	16	16	NT	14.8
Total Organic Halogen	0.03	mg/l	0.0373	ND	NT	0.0476
Total Recoverable Phenolics	0.01	mg/L	ND	ND	NT	0.013
Zinc	0.005	mg/l	0.0898	0.0144	NT	0.0056

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

**Table 8.1.2 Tier II Chemical Inventory Reporting List -- Pittsburgh**

Chemical Name	CAS #	Average and Maximum Daily Amount (lbs)	TPQ (lbs)
Nitrogen, liquid	7727-37-9	182,115	10,000
Nitric oxide	10102-43-9	672	100
Sulfur dioxide	7446-09-5	2,678	500

<u>Table 8.2.1 TSCA Chemicals Held Onsite In Excess Of 10 Lbs. -- Pittsburgh</u>	
<b>Common Name</b>	<b>CAS</b>
Naphthalene, 1,2,3,4-tetrahydro-	000119-64-2
Carbon Tetrachloride	000056-23-5
Boric Acid	010043-35-3
Nitric Acid	007697-37-2
Hydrochloric Acid	007647-01-0
N-Hexane	000110-54-3
Sodium Acetate	000127-09-3
Carbon Dioxide	000124-38-9
Ethyl Acetate	000141-78-6
Ferric Chloride	007705-08-0
Methanol	000067-56-1

<u>Table 8.4.1 2007 Radioactive Material (RM) -- Pittsburgh</u>				
<b>Isotope</b>	<b>Qty</b>	<b>Activity</b>	<b>Supplier/Source</b>	<b>NRC License</b>
Ni-63	2	15 mCi	Gas Chromatograph Electron Capture Device – <b>Out of Service</b>	Held by Hewlett Packard
Cs-137	3	40 mCi (2); 20 mCi (1)	Ronan Engineering Company, Model 137; Level Density Gauge – <b>Out of Service</b>	Held by Parsons
Assorted	80	Consumer Product	Smoke Detectors	Not Required

<u>Table 8.4.2 2007 Other Radiation Generating Devices: X-ray Devices -- Pittsburgh</u>		
<b>Device</b>	<b>Quantity</b>	<b>Location</b>
X-Ray Tube	1	B-902 Mail Sorting Facility
X-Ray Diffraction Instrument	1	B-94 X-Ray Diffraction Laboratory
Scanning Electron Microscope	2 Devices	B-94 Laboratory
Electron Spectroscopy for Chemical Analysis	2 X-Ray Tubes	B-94 Electron Spectroscopy for Chemical Analysis Laboratory

<b>Table 8.5.1 Air Emissions Based on Fuel Usage -- Pittsburgh</b>					
<b>Estimated Emissions (Tons/Year)</b>					
<b>Pollutant</b>	<b>MCCF</b>	<b>Combined Boilers</b>	<b>Unpaved Roads</b>	<b>Paved Roads</b>	<b>Total Site</b>
Carbon Monoxide	0.0	0.077111	0.00121	0.05288	0.131201
Lead	0.0	0.0	0.0	0.0	0.0
Nitrogen Dioxide	0.0	0.113719	0.000087	0.00377	0.117567
Particular Matter <10 micron	0.0	0.005098	0.02522	0.22663	0.256948
Particular Matter Total	0.0	0.003782	0.08723	1.17093	1.261942
Sulfur Dioxide	0.0	0.000683	0.0	0	0.000683
VOCs	0.0	0.0067704	0.0000826	0.0034	0.010253

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

Constituent	Free Cyanide	Phenol	Copper	Mercury	Chloroform	pH
Permit Limit	<0.005 mg/L	0.025 mg/L	0.08 mg/L	<0.0002 mg/L	<5 µg/L	6.0 - 9.0 s.u.
April 04, 2007 Sampling Date						
<b>Building 74 Effluent</b>						
Composite	ND (< 0.0039 mg/l)	ND (< 0.017 mg/l)	0.0029 mg/l	ND (< 0.000051 mg/l)	ND (< 0.40 µg/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	6.66 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	6.75 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	6.78 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	6.85 s.u.
October 24, 2007 Sample Date						
<b>Building 74 Effluent</b>						
Composite	ND (< 0.0016 mg/l)	ND (< 0.0092 mg/l)	0.0017 mg/l	ND (< 0.000051 mg/l)	ND (< 0.16 µg/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	6.60 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	7.55 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	7.52 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	8.68 s.u.

ND = not detected; s.u. = standard units; mg/L = milligrams per liter; µg/L = micrograms per liter;

Table 8.6.2 Building 74 2007 Monthly Monitoring results (mg/l) -- Pittsburgh

Constituent	Permit Limit	01/10	02/07	03/07	04/04	05/09	06/06	07/11	08/08	09/05	10/24	11/07	12/05
		STL	STL	STL	STL	STL	STL	Test America	Test America	Test America	Test America	Test America	Test America
Aluminum	None	0.188	0.459	0.210	0.0781	0.0812	0.150	0.972	1.130	1.520	0.449	0.244	0.209
Cadmium	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	None	0.00082	0.0012	0.0012	ND	0.00065	ND	0.0012	0.0014	0.0019	0.00091	ND	ND
Cooper	0.08	0.0087	0.0012	0.001	0.0024	ND	ND	0.00080	0.00480	0.0011	0.0022	0.0012	ND
Cyanide (free)	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOX	None	0.0228	0.0199	0.0198	0.0343	0.0217	0.0201	ND	ND	ND	ND	ND	0.0242
Iron	None	0.155	0.0686	0.0620	0.0221	0.0593	0.208	0.252	0.400	0.407	0.308	0.228	0.460
Lead	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	<0.0002	ND	0.000068	ND	0.000066	0.000062	ND	ND	ND	ND	ND	ND	ND
Nickel	None	0.018	0.0054	0.0021	0.0032	0.0023	0.0023	ND	ND	ND	ND	ND	ND
Oil & Grease	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (s.u.)	6.0 – 9.0	6.6	7.0	6.2	6.8	7.6	7.8	8.0	8.4	7.1	7.4	7.0	6.7
Phenolics	0.025	ND	ND	ND	0.017	ND	ND	0.022	ND	ND	ND	ND	0.013
TSS	None	ND	ND	25.2	ND	ND	ND	6.4	ND	3.6	ND	ND	ND
Tin	None	ND	ND	ND	ND	ND	ND	ND	0.0026	0.0032	0.0038	ND	0.0036
Trichloromethane	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	None	0.0139	0.0266	0.0119	0.0052	0.0054	ND	ND	0.0058	ND	0.0054	ND	0.0216

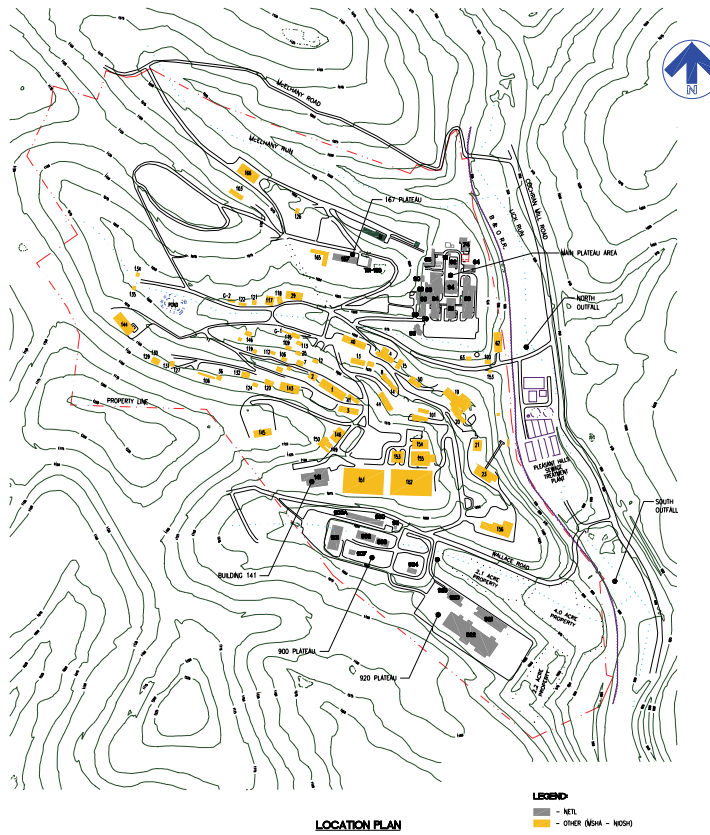
ND = not detected; s.u. = standard units; mg/L = milligrams per liter;



Table 8.6.3 National Pollutant Discharge Elimination System Storm Water  
Analysis Results -- Pittsburgh

Constituent	Sample Date			
	03/14/07	04/25/07	09/11/07	12/19/07
<b>North Outfall – PGH</b>				
Flow	0.243 MGD	0.261 MGD	0.055 MGD	0.306 MGD
Suspended Solids	ND (< 3.4 mg/L)	13.6 mg/L	4.0 mg/L	4.4 mg/L
CBOD5	ND (< 0.30 mg/L)	ND (< 0.30 mg/L)	2.6 mg/L	ND (< 0.30 mg/L)
Oil and Grease	ND (< 0.46 mg/L)	ND (< 0.46 mg/L)	ND (< 0.47 mg/L)	ND (< 0.47 mg/L)
Aluminum	0.238 mg/L	0.138 mg/L	0.106 mg/L	0.0791 mg/L
Iron	0.731 mg/L	0.333 mg/L	0.410 mg/L	0.181 mg/L
Manganese	0.397 mg/L	0.271 mg/L	0.148 mg/L	0.154 mg/L
Lead	ND (< 1.5 µg/L)	ND (< 1.5 µg/L)	ND (< 2.4 µg/L)	ND (< 2.4 µg/L)
Mercury	ND (< 0.047 µg/L)	ND (< 0.051 µg/L)	ND (< 0.051 µg/L)	ND (< 0.051 µg/L)
pH	7.99 s.u.	8.23 s.u.	8.11 s.u.	7.45 s.u.
Ammonia	0.11 mg/L	0.18 mg/L	0.16 mg/L	0.20 mg/L
<b>South Outfall – PGH</b>				
Flow	0.178 MGD	1.317 MGD	6.139 MGD	0.427 MGD
Suspended Solids	37.2 mg/L	31.2 mg/L	109 mg/L	38.4 mg/L
Aluminum	7.550 mg/L	7.430 mg/L	2.080 mg/L	8.090 mg/L
Iron	0.917 mg/L	2.080 mg/L	2.130 mg/L	1.380 mg/L
Manganese	0.751 mg/L	0.344 mg/L	0.294 mg/L	0.971 mg/L
Lead	ND (< 1.5 µg/L)	14.6 µg/L	15.6 µg/L	5.0 µg/L
pH	7.63 s.u.	7.80 s.u.	8.08 s.u.	7.01 s.u.
Ammonia	0.48 mg/L	1.6 mg/L	0.57 mg/L	0.67 mg/L

Figure 8.7.1 Topographic Site Map of Pittsburgh



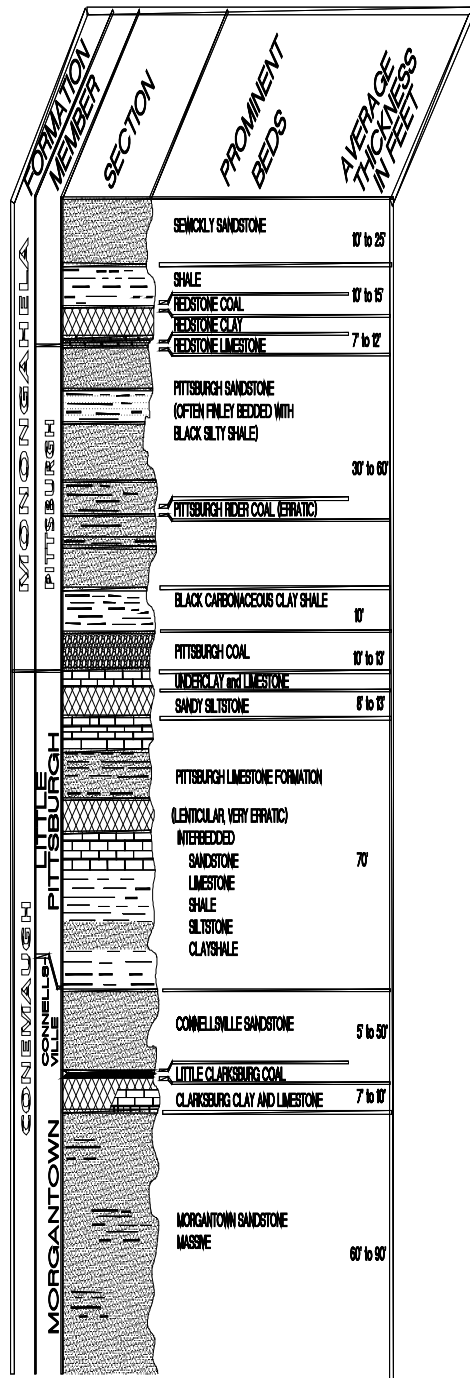


Figure 8.7.2 General Geologic Column -- Pittsburgh

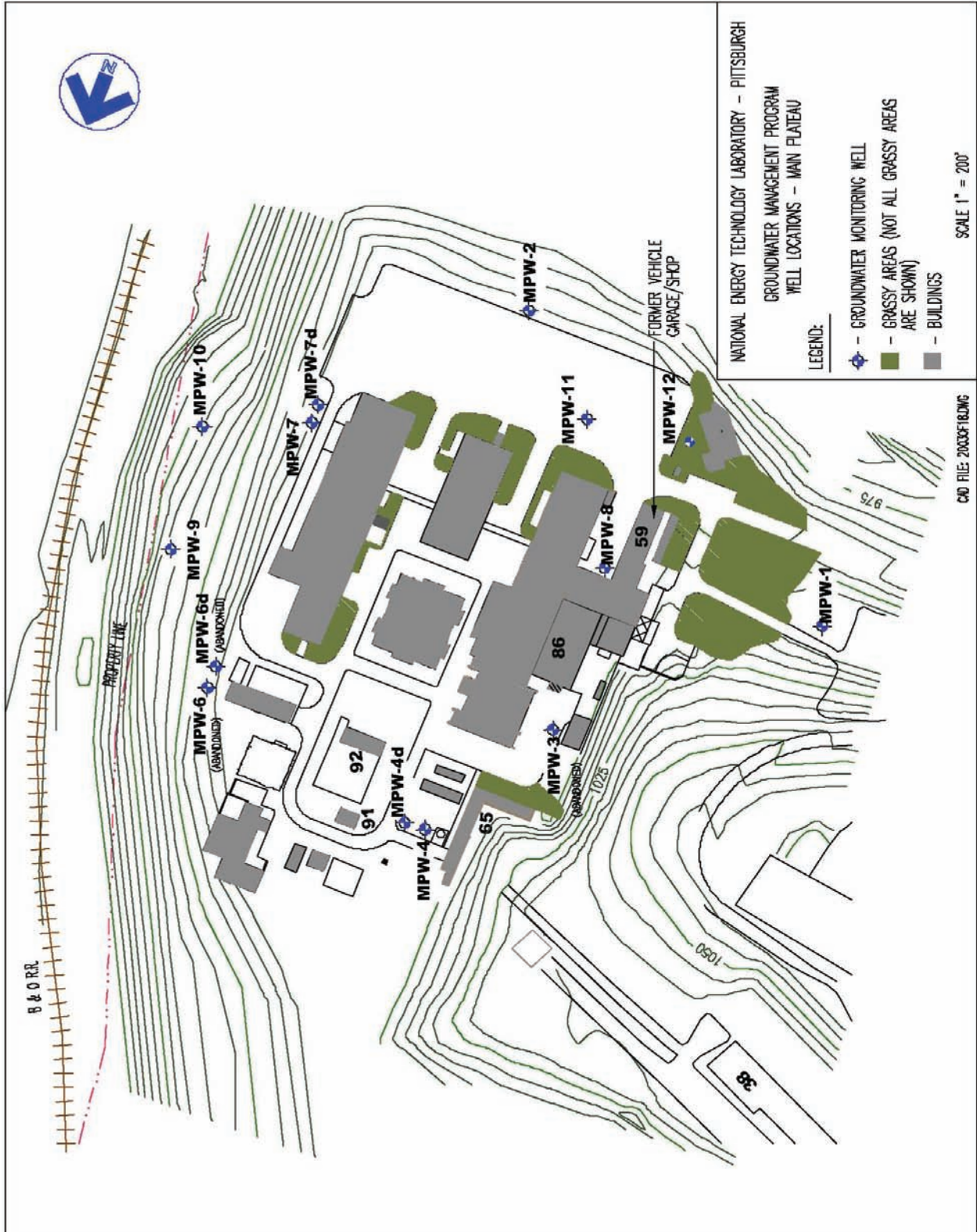
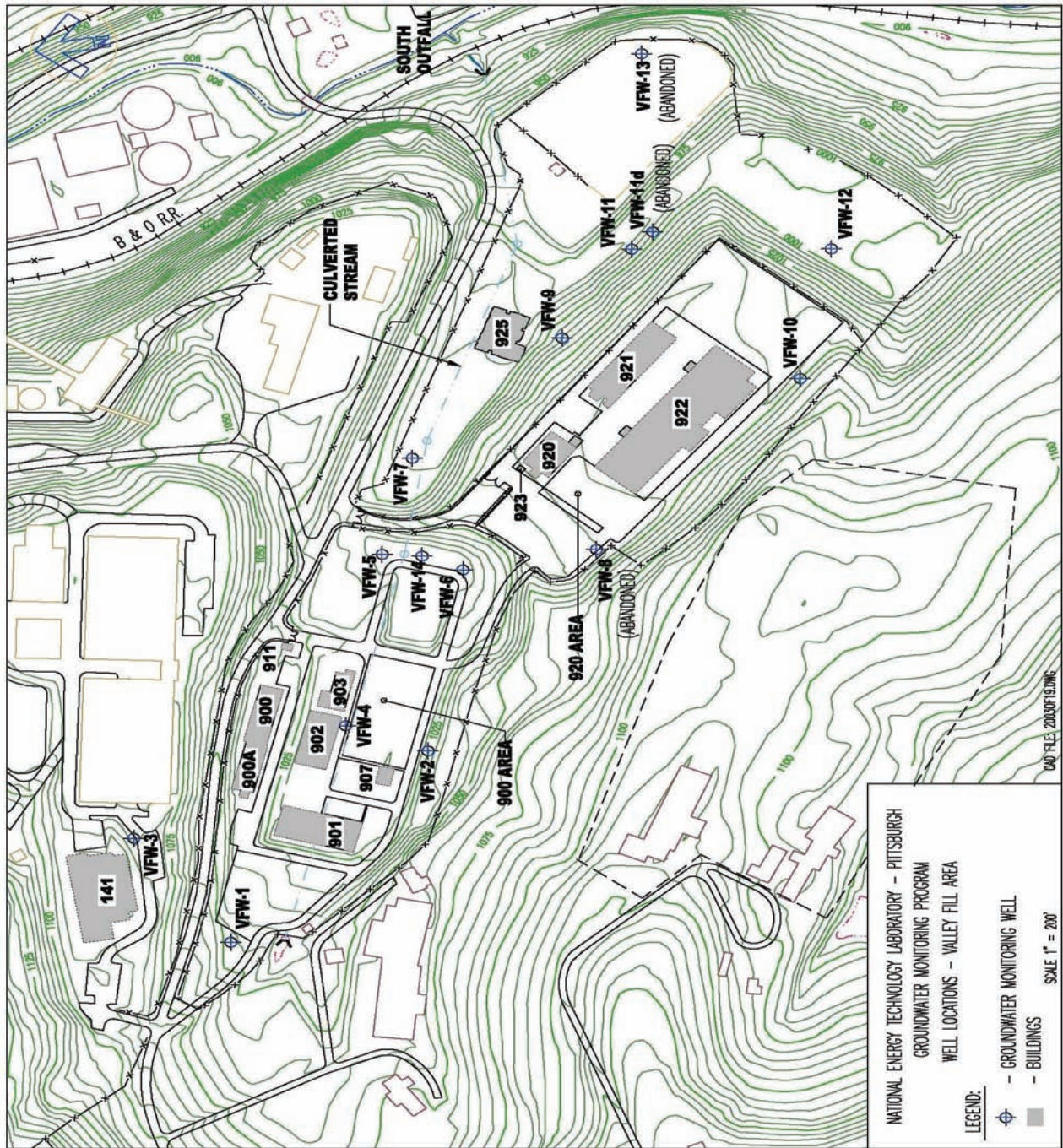


Figure 8.7.3 Groundwater Management Program Main Plateau Well Locations  
 - Pittsburgh



[Figure 8.7.4 Groundwater Management Program Valley Fill Well Locations -- Pittsburgh](#)

**Table 8.7.5 Groundwater Detection Monitoring Program – Results of Analysis  
-- Pittsburgh**

Well	Sample Date							
	05/10/07				10/04/07			
Constituents	pH	Specific Conductance	Temperature	TPH-DRO	pH	Specific Conductance	Temperature	TPH-DRO
VFW-2	7.49	4600	12.2	0.048	7.20	3340	17.0	0.066
VFW-4	7.06	2950	15.8	ND	6.90	2400	16.0	ND
VFW-7	7.20	4630	15.6	0.069	7.12	3730	15.3	0.063
VFW-9	NS	NS	NS	NS	6.94	855	13.6	0.100
VFW-10	7.23	1886	14.1	ND	6.98	3370	15.8	0.090
VFW-11	7.59	1748	12.4	ND	7.25	1819	15.0	ND
VFW-12	7.33	3020	12.3	ND	7.37	3270	14.5	0.080
VFW-14	7.25	2670	13.3	ND	6.69	5980	15.8	ND

pH unit: standard unit; Specific conductance unit: umhos/cm @ 25 °C; Temperature unit: degree centigrade  
TPH-DRO: Total Petroleum Hydrocarbons – Diesel Range Organics; TPH-DRO unit: mg/l; ND: Non Detect; NS: Not Sampled

**Table 10.4 Albany 2007 X-Ray Radiation Generating Devices**

Device	Quantity	Location
X-Ray Florescence	1	Building 1 Room 101
X-Ray Diffraction Instrument	1	Building 1 Room 115
Scanning Electron Microscope	2	Building 1 Room 109, Building 1 Room 119
Transmission Electron Microscope	1	Building 1 Room 102
Sedigraph	1	Building 17 Room 110

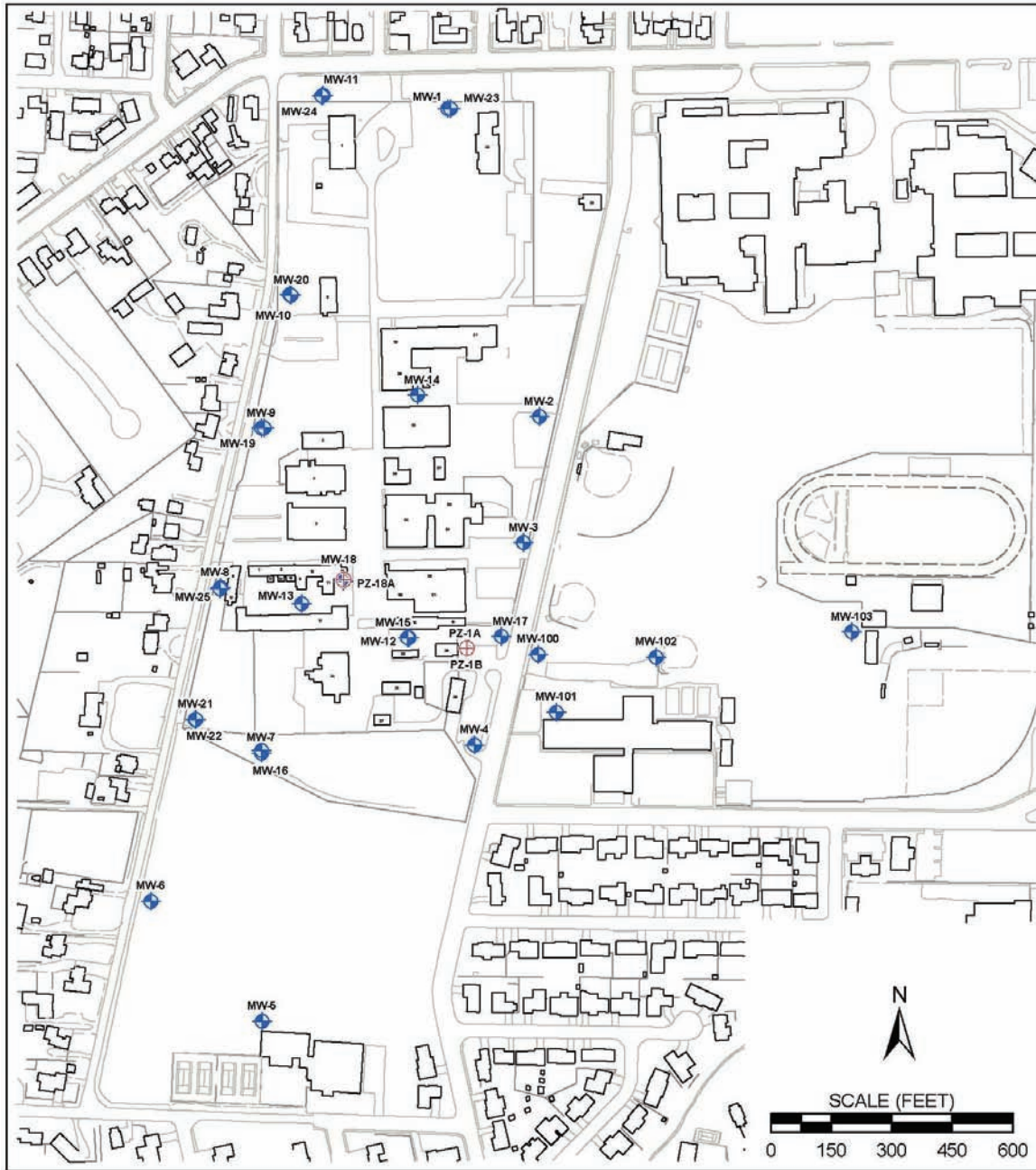


Figure 10.8 Monitoring Well Locations at the Albany Site

