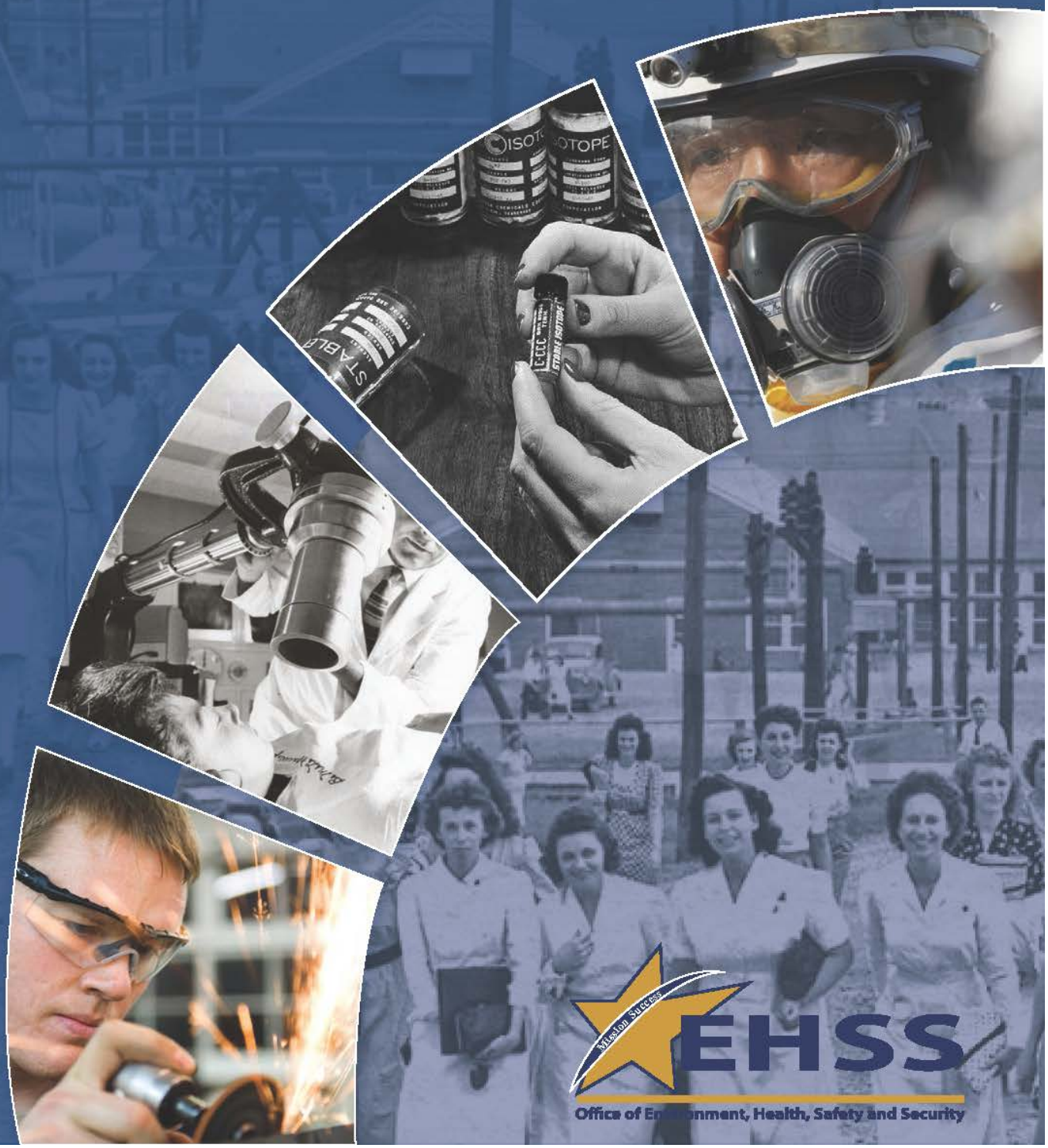
FORMER WORKER MEDICAL SCREENING PROGRAM

ANNUAL REPORT 2015



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Abbreviations Used in This Report

ACOEM	*American College of Occupational and Environmental Medicine*
AEC	*Atomic Energy Commission*
AFL-CIO	*American Federation of Labor and Congress of Industrial Organizations*
AU	*DOE Office of Environment, Health, Safety and Security*
BAECP	*Burlington Atomic Energy Commission Plant*
BeLPT	*Beryllium Lymphocyte Proliferation Test*
BTMed	*Building Trades National Medical Screening Program*
CHSi	*Comprehensive Health Services, Inc.*
CMIO	*Chief Medical Informatics Officer*
COPD	*Chronic Obstructive Pulmonary Disease*
CPWR	*CPWR – The Center for Construction Research and Training*
CT	*Computed Tomography*
CXR	*Chest X-ray*
DOE	*U.S. Department of Energy*
DOL	*U.S. Department of Labor*
EEOICP	*Energy Employees Occupational Illness Compensation Program*
EEOICPA	*Energy Employees Occupational Illness Compensation Program Act*
ELCD	*Early Lung Cancer Detection*
FMPC	*Feed Materials Production Center*
FWP	*Former Worker Medical Screening Program or Former Worker Program*
FY	*Fiscal Year*
GDP	*Gaseous Diffusion Plant*
HIPAA	*Health Insurance Portability and Accountability Act*
HSW	*Health, Safety and Environment Department*
IAAP	*Iowa Army Ammunition Plant*
INL	*Idaho National Laboratory*
JHBSPH	*Johns Hopkins Bloomberg School of Public Health*
JHU	*Johns Hopkins University*

JOTG	*Joint Outreach Task Group*
K-25	*Oak Ridge K-25 Gaseous Diffusion Plant*
LANL	*Los Alamos National Laboratory*
LDCT	*Low-Dose Computed Tomography*
NIOSH	*National Institute for Occupational Safety and Health*
NNSS	*Nevada National Security Site (formerly known as Nevada Test Site)*
NSSP	*National Supplemental Screening Program*
ORAU	*Oak Ridge Associated Universities*
ORNL	*Oak Ridge National Laboratory*
PFT	*Pulmonary Function Test*
PHI	*Protected Health Information*
PII	*Personally Identifiable Information*
SERT	*Secure Electronic Records Transfer*
SNL	*Sandia National Laboratories*
UNM	*University of New Mexico*
USW	*United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union*
UTHSCT	*University of Texas Health Science Center at Tyler*
VDGF	*Vapors, Gases, Dusts and Fumes*
WHPP	*Worker Health Protection Program*
Y-12	*Y-12 National Security Complex*

Foreword

In Fiscal Year (FY) 2015, the Department of Energy (DOE) Former Worker Medical Screening Program, or Former Worker Program (FWP), continued to successfully fulfill its congressional mandate of delivering medical screening exams, at no cost, to all interested and eligible former DOE Federal, contractor, and subcontractor workers. The FWP was established by the U.S. Congress as part of Section 3162 of the National Defense Authorization Act for FY 1993. Since 1996, the program has made great strides in addressing the occupational health legacy of the Department's 70-plus years of nuclear weapons design and production and continued to fulfill the crucial mandate that the U.S. Congress entrusted to it.

The overall success of the FWP is ultimately measured by the number of former workers who can be identified, located, contacted, and provided with timely medical screening examinations and recommendations for followup medical care. The process requires close coordination, timely communication, and frequent interaction among several stakeholders that include workers, labor unions, worker advocates, DOE Headquarters program offices, DOE field and site offices, and DOE contractors. Also important is effectively meeting the requirements to adequately protect personally identifiable information and protect health information that is collected for use in the program. The overall strategy in FY 2015 was to focus on our program delivery in order to continue providing our former workers with quality medical screening exams at convenient locations and in a timely manner.

Words about values and commitment to our former workers, no matter how eloquent, can only go so far. Like so many parts of our language, these words may become overused, distorted, and diluted. Our actions, as a Nation, an organization, and as individuals, must signal our commitment to the values we so often proclaim. Frequently, we look for new ways to describe our commitment to find a more eloquent or poignant way to express it to our stakeholders. But the answer is simple and active: what matters most are our actions.

The FWP, through its outreach and screening activities, is our commitment to our former workers through tangible actions. The program has made significant contributions and provided valuable health information to thousands of former workers since it began, actions that demonstrate our commitment to the health and safety of the members of our past, present, and future workforce.

We want to thank the former workers for their service at our DOE sites, and our daily actions will continue to demonstrate our commitment to providing the high quality medical services to which they are entitled.

Matthew B. Moury
Associate Under Secretary for
Environment, Health, Safety and Security
Office of Environment, Health, Safety and Security
U.S. Department of Energy

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Executive Summary

The U.S. Department of Energy's (DOE) Former Worker Medical Screening Program, or Former Worker Program (FWP), directly benefits former DOE workers by: (1) identifying signs or symptoms of work-related health conditions at an early stage when they are more treatable; and (2) improving workers' understanding of health risks they may face due to possible exposures during their prior employment with DOE. The medical screening exam offered uses a customized medical screening protocol that was developed by a team of independent physicians specializing in occupational medicine.

This Annual Report presents an overview of the structure and accomplishments of the FWP. The FWP was mandated by the U.S. Congress as part of Section 3162 of the National Defense Authorization Act for Fiscal Year (FY) 1993 (Public Law 102-484). The FWP provides ongoing medical screening examinations, at no cost, to all interested and eligible former DOE Federal, contractor, and subcontractor workers from all DOE sites, as well as former workers from its predecessor Agencies (the Manhattan Engineer District, the Atomic Energy Commission, and the Energy Research and Development Administration). In FY 2015, the FWP continued to successfully fulfill its congressional mandate of delivering free medical screening services to all interested and eligible former workers.

The program activities undertaken included the following:

1. **Outreach.**
   - In FY 2015, completed the largest ever outreach campaign reaching out to over 353,000 potential participants. This represents close to a 75% increase in number of contacts relative to FY 2014.
2. **Ongoing Medical Screening.**
   - In FY 2015, 3,173 initial medical examinations and 5,281 re-screen medical exams were conducted.
   - In FY 2015, 671 participants were screened for occupational lung cancer with low-dose helical computed tomography (CT), and a total of 3,822 CT scans were performed; this includes baseline, followup, and annual scans.
   - In FY 2015, 98 percent of the participants indicated satisfaction with the program and the delivery of medical screening exams.
3. **Communicate Results.**
   - Exam results are provided to participants in a letter. When appropriate, the FWP physicians include causation language in the results letters when a condition is possibly work related. The inclusion of causation language can be very helpful for participants who decide to file a claim under the Energy Employees Occupational Illness Compensation Program Act.
4. **Protect Personally Identifiable Information and Protected Health Information.**
   - All medical information that is collected as part of this program is treated as confidential and is used only as allowed by the Privacy Act of 1974 and the Health Insurance Portability and Accountability Act.

A description of the organizations conducting the medical screening exams and biographies of each of the Principal Investigators is provided in Appendix A.

"I look forward to the physical. I feel that they may catch something that my regular physician would overlook…."

- Charles C. Belangia, former Savannah River Site construction/building trades worker

1.0 Program Overview

This Annual Report presents an overview of the structure and accomplishments of the U.S. Department of Energy's (DOE) Former Worker Medical Screening Program or Former Worker Program (FWP). This report provides the Fiscal Year (FY) 2015 updates, as well as cumulative program results. The FWP is a congressionally mandated program that is responsible for providing medical screening exams, at no cost, to all interested and eligible former DOE Federal, contractor, and subcontractor workers from all DOE sites and/or its predecessor Agencies (the Manhattan Engineer District, the Atomic Energy Commission (AEC), and the Energy Research and Development Administration). The medical screening exams offered by the FWP are designed to check for potential adverse health effects related to occupational exposures, including but not limited to radiation, beryllium, asbestos, lasers, silica, welding fumes, lead, cadmium, chromium, solvents, and noise.

The program was established following the issuance of the National Defense Authorization Act for FY 1993 (Public Law 102-484), which called for DOE to:

> *"… establish and carry out a program for the identification and on-going medical evaluation of its… former employees who are subject to significant health risks as a result of the exposure of such employees to hazardous or radioactive substances during such employment."*

Since the inception of the FWP, DOE has made great strides in addressing the occupational health legacy of its nuclear weapons design and production activities. The FWP, managed by the DOE's Office of Environment, Health, Safety and Security (AU), uses independent occupational health experts from universities, labor unions, and commercial organizations to administer the medical screening program. Using these third-party providers ensures that medical evaluation services are objective and credible. Their dedication to the DOE workforce over the past 19 years has resulted in high-quality services, and the level of satisfaction expressed by participants, 98 percent on surveys, speaks to the skill and professionalism of the organizations administering the program for AU. As of September 2015, a total of 119,512 medical exams have been conducted through the FWP.

The FWP consists of four regional projects located near major DOE sites, as well as two nationwide projects.

The regional FWP projects include:

- Pantex Former Worker Medical Surveillance Program, conducted by Drexel University School of Public Health in conjunction with the University of Texas Health Science Center at Tyler and West Texas A&M Partners Clinic
- Medical Exam Program for Former Workers at Los Alamos and Sandia (New Mexico) National Laboratories, conducted by Johns Hopkins Bloomberg School of Public Health in conjunction with the University of New Mexico
- Worker Health Protection Program (WHPP), conducted jointly by Queens College of the City University of New York, United Steelworkers, the Atomic Trades and Labor Council in Oak Ridge, and the former Fernald Atomic Trades and Labor Council

- Former Burlington AEC Plant and Ames Laboratory Workers Medical Screening Program, conducted by The University of Iowa College of Public Health

The nationwide FWP projects include:

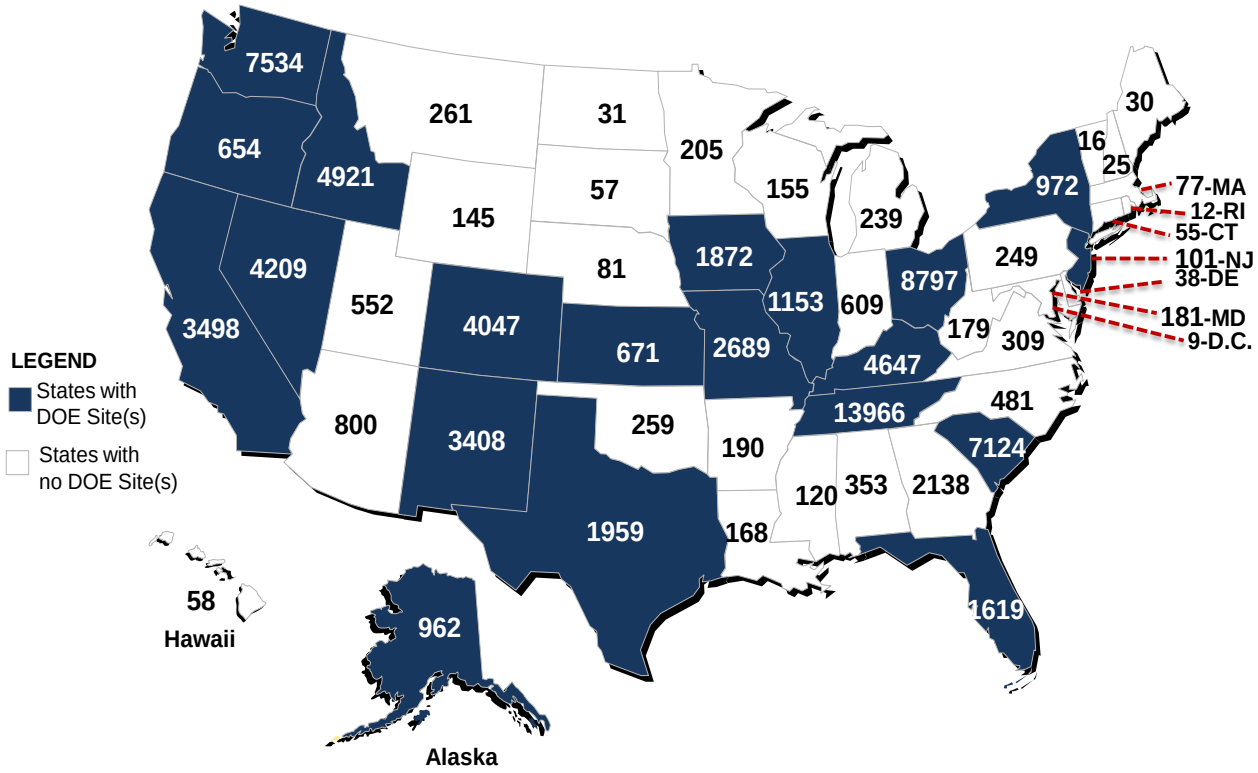
- National Supplemental Screening Program (NSSP), conducted by Oak Ridge Associated Universities (ORAU) in conjunction with Axion Health, Comprehensive Health Services, National Jewish Health, and the University of Colorado Denver

- Building Trades National Medical Screening Program (BTMed), conducted by CPWR – The Center for Construction Research and Training (CPWR) in conjunction with Duke University Medical Center, the University of Cincinnati Medical Center, and Zenith-American Solutions

A listing of DOE sites and the organizations conducting medical screening exams for former workers is provided on the FWP Web site (http://energy.gov/ehss/downloads/former-worker-program-summary-services)[1]. Individual FWP project descriptions are provided in Appendix A of this report.

Medical screenings are provided at clinics in communities near DOE sites, as well as through a large network of health clinics nationwide, that allow services to be provided near most workers' residences. This network of clinics has allowed the FWP to provide medical screening exams in all 50 States and several international locations (see Figure 1).

[1] Links to referenced documents have been included for the reader's convenience, but please be aware that links may change when newer versions of the cited documents are posted on the Web site.



ALABAMA	353	FLORIDA	1619	MAINE	30	NEW HAMPSHIRE	25	RHODE ISLAND	12	WISCONSIN	155	*NORWAY*	*1*
ALASKA	962	GEORGIA	2138	MARYLAND	181	NEW JERSEY	101	SOUTH CAROLINA	7124	WYOMING	145	*UNITED ARAB EMIRATES*	*1*
ARIZONA	800	HAWAII	58	MASSACHUSETTS	77	NEW MEXICO	3408	SOUTH DAKOTA	57			*MARSHALL ISLANDS*	*1*
ARKANSAS	190	IDAHO	4921	MICHIGAN	239	NEW YORK	972	TENNESSEE	13966	*NOT DISPLAYED:*			
CALIFORNIA	3498	ILLINOIS	1153	MINNESOTA	205	NORTH CAROLINA	481	TEXAS	1959	*PUERTO RICO*	*2*		
COLORADO	4047	INDIANA	609	MISSISSIPPI	120	NORTH DAKOTA	31	UTAH	552	*PHILIPPINES*	*1*		
CONNECTICUT	55	IOWA	1872	MISSOURI	2689	OHIO	8797	VERMONT	16	*VIRGIN ISLANDS*	*1*		
DELAWARE	38	KANSAS	671	MONTANA	261	OKLAHOMA	259	VIRGINIA	309	*CANADA*	*8*		
DISTRICT OF COLUMBIA	9	KENTUCKY	4647	NEBRASKA	81	OREGON	654	WASHINGTON	7534	*GREECE*	*1*		
		LOUISIANA	168	NEVADA	4209	PENNSYLVANIA	249	WEST VIRGINIA	179	*IRELAND*	*2*		

Figure 1. Participants Screened by State of Residence (through September 2015)

The FWP directly benefits former DOE workers by: (1) identifying signs or symptoms of work-related health conditions at an early stage when they are more treatable; and (2) improving workers' understanding of health risks they may face due to possible exposures during their prior employment with DOE.

Additional information on the FWP, how it is managed and administered by DOE, and descriptions of the medical exam components can be found on the FWP Web site (http://energy.gov/ehss/services/worker-health-and-safety/former-worker-medical-screening-program).

"Shortly after my Worker Health Protection Program Early Lung Cancer Detection scan, my doctor and I received a letter with the results that I had fluid in my abdominal area. I underwent a series of tests, then a surgery where I learned I had a rare form of appendix cancer that required an innovative treatment. Now over five years later, there have been no signs of the cancer returning. Without the CT scan, there was little chance this cancer would have been discovered in time to save my life."

- Marie Watts, former Y-12 production worker

2.0 Program Implementation

Program implementation focuses primarily on four specific activities, which are:

1. **Outreach:** Identify the potential pool of former DOE workers and notify them of FWP medical screening services.
2. **Ongoing Medical Screening:** Provide medical screening exams that are designed to check for health conditions related to occupational exposures in former workers who choose to participate in the program, including a re-screen exam every 3 years.
   a. **Conventional Medical Screening Program**
   b. **Early Lung Cancer Detection Program**
3. **Communicate Results:** Provide medical screening exam results to participants, as well as information concerning any conditions that may require followup medical care with their personal physicians or specialists, and provide information regarding possible compensation for work-related illnesses.
4. **Protect Personally Identifiable Information (PII)/Protected Health Information (PHI):** Protect the confidentiality and privacy of participants.

1. Outreach: Identify the potential pool of former DOE workers and notify them of FWP medical screening services.

WHPP attends an outreach event in Portsmouth, OH.

Since the inception of the FWP, DOE realized there would be challenges in locating workers to participate in the medical screening program; there is no centralized database of former DOE workers. In addition, many workers were employed intermittently by subcontractors, and these companies typically did not leave a copy of employee records with the prime contractor when their job was completed. Thus, the availability of rosters varies greatly by site.

Rosters are lists of names of former DOE workers, along with other identifying information, that may be available from employers or DOE. AU works closely with DOE Headquarters program offices to obtain rosters of former workers from site contractors, as well as field and site offices. Invitations are sent by the FWP projects to individuals using the last known address. When addresses are found to be outdated or inaccurate, supplemental outreach methods

are used by FWP projects; these include address-update services, such as credit bureaus, or Internal Revenue Service mailing services.

Dr. Lar Fuortes, The University of Iowa, addresses former Ames Lab workers at an outreach event.

Beginning in FY 2015, the rosters of former workers are now transmitted electronically to the FWP projects through the Secure Electronic Records Transfer (SERT) system. The SERT system, hosted by DOE, was originally designed to assist DOE, the U. S. Department of Labor (DOL), and the National Institute for Occupational Safety and Health (NIOSH) with the secure electronic transmission of records for claims filed under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA). The system was expanded in FY 2015 to include a separate FWP module to facilitate the safe transfer of rosters from the work site to the FWP project that provides screening examinations.

All of the FWP projects use multiple outreach methods to notify eligible former DOE workers about the availability of FWP services and to increase the visibility of the program in communities surrounding DOE sites. Program information is provided in exit packets for workers separating from a site and hyperlinks on retiree and DOE site webpages. To further increase awareness of the FWP, AU recently sent out a Department-wide message informing current workers of the availability of medical screening for former DOE workers and to make current workers aware of their eligibility to participate in the program once they have retired/separated from DOE.

In FY 2009, the Joint Outreach Task Group (JOTG) was established to enhance communication and coordination. The JOTG includes representatives from DOE, DOL, NIOSH, DOL's Office of the Ombudsman for EEOICPA, the Ombudsman to NIOSH for EEOICPA Part B, and the DOE-funded FWP projects. The goal was to coordinate outreach efforts between the Agencies involved in the FWP and the EEOICPA. To meet this goal, the JOTG holds town hall meetings in and near the communities of DOE sites. This partnership among different government Agencies responds to the President's recommendations for transparency and open government. In FY 2015, eight meetings were held in or near the communities of seven DOE sites. To date, meetings have been held in, and near, the communities of 29 DOE sites.

The mission of the Department, as well as its predecessor Agencies, has been undertaken for 70-plus years, including nuclear weapons design and production and other activities that may have exposed its workers to toxic substances. The FWP projects continued to conduct aggressive outreach efforts in FY 2015. As of September 30, 2015, FWP projects have attempted to contact over 1,000,000 potential FWP participants who may have been involved in these activities and who may have developed work-related illnesses as a result of their exposure to hazardous materials. In FY 2015, over 353,000 potential participants were contacted. Those who are interested and eligible have either completed their medical screening examinations or are in the process of being scheduled for an exam. Despite the aggressive outreach efforts, there are many reasons why former workers may not wish to participate in the FWP, including they believe they are in good health, they are simply not interested in screening, or they may be deceased. Additional information regarding outreach can be found on the FWP Web site (http://energy.gov/ehss/outreach-former-worker-medical-screening-program-fwp).

2. Medical Screening: Provide medical screening exams that are designed to check for health conditions related to occupational exposures in former workers who choose to participate in the program, including a re-screen exam every 3 years.

a. Conventional Medical Screening Program

Medical screening is used to identify diseases or precursor conditions at an early stage of development, often before signs and symptoms occur, and to refer individuals with suspicious findings to their personal physician or a specialist for further testing, diagnosis, and treatment. The FWP is not intended to serve as a substitute for routine medical exams received through an individual's personal physician; however, the program provides some general health screening services.

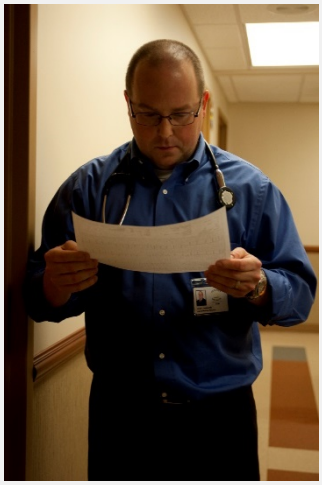
The medical screening exam offered by the FWP evaluates a former employee's health as it relates to their potential occupational exposure to hazardous agents. The FWP uses a customized medical screening protocol that was developed by a team of independent physicians specializing in occupational medicine. The protocol is updated, as necessary, based on new research findings within the scientific/medical community. The health conditions targeted in the medical screening exams include chronic lung diseases, beryllium-related disorders, hearing loss, and damage to other selected major organ systems that may be associated with occupational exposures. A listing of exposures and medical examinations offered through the FWP is available in the medical protocol posted on the FWP Web site (http://energy.gov/ehss/downloads/former-worker-program-medical-protocol).

Before participating in the medical screening program, former workers must complete a medical history questionnaire and an occupational history questionnaire, either on their own or via an interviewer-conducted session. The interviews are conducted by the local outreach coordinators employed by the FWP projects who, in many cases, are former workers with knowledge of DOE sites and exposures.

The initial medical screening examination includes a physical examination and may consist of the following based on the individual's occupational exposure history:

- Chest x-ray with B reading (interpretation for occupational lung disease)
- Spirometry (breathing test)
- Beryllium Lymphocyte Proliferation Test (BeLPT)
- Blood chemistry test
- Urinalysis
- Audiometry (hearing test).

Participation in the FWP is completely voluntary, and participants can refuse any portion of the medical screening examination.



Due to the latency period (the time between the exposure and the onset of the disease) of occupational-related diseases, the FWP also offers re-screen examinations 3 years after the initial medical screening and every 3 years thereafter. The re-screening improves the detection of occupational disease, which may not show signs or symptoms for decades after exposure. It should also be noted that certain medical exams may be recommended only during the initial screening exam and excluded from the re-screen exam. For example, audiometry (hearing test) is not offered on the re-screen exam since occupational hearing loss would typically be detected during the initial screening exam.

In addition to its core function of identifying conditions that may have been related to workplace exposures, the program also provides some general health screening services at minimal cost to the DOE. Participants are screened for some common non-occupational health conditions, such as diabetes (blood sugar), coronary artery disease (cholesterol), cardiovascular disease/hypertension (blood pressure), obesity, and elevated creatinine levels (a blood test used to assess kidney function).

Incidental findings may occur during the medical exam. An incidental finding, or unanticipated abnormal finding, is information discovered during routine medical exams that, in some cases, ends up saving lives. Examples of incidental findings as a result of certain components of the medical exam include:

- Chest x-ray: pneumonia, abdominal aortic aneurysm
- Audiogram (hearing test): age-related hearing changes
- Complete blood count: anemia
- Physical exam: non-cancerous skin conditions.

The results of general health screening tests, as well as findings during examinations, can be of great benefit to a participant. Many of the conditions that fall into this category can be treated by the participant's personal physician and can significantly improve longevity and quality of life. DOE and the FWP projects are committed to ensuring that the overall well-being of our former workers is evaluated within the program.

In FY 2015, 3,173 initial exams and 5,281 re-screen exams were conducted. As of September 30, 2015, a total of 119,512 medical exams have been conducted through the FWP, 82,758 initial screening exams and 36,754 re-screen exams. A breakdown of the number of initial and re-screen exams for the past several years is presented below (Figure 2).

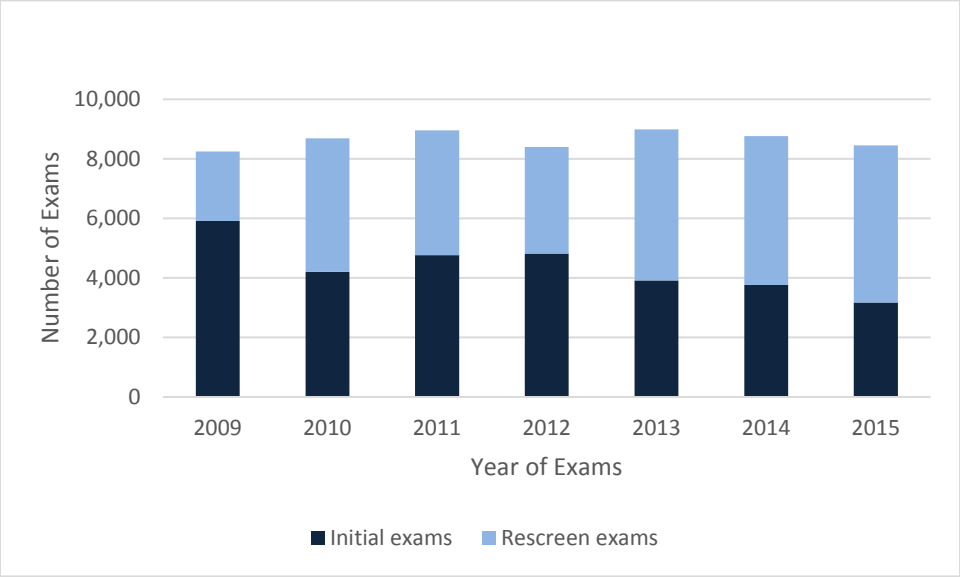
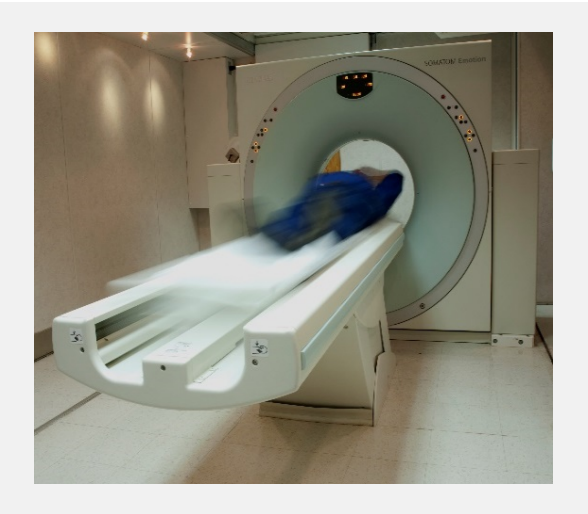


Figure 2. Initial and Re-Screen Exams by Year (2009 – 2015)

A breakdown of the number of initial and re-screen exams by DOE site is presented in appendix B. A detailed description of the components of the medical screening exams can be found on the FWP Web site (http://energy.gov/ehss/conventional-medical-screening-program). The medical findings by DOE site can be found in appendix C.

b. Early Lung Cancer Detection Program



Since 2000, DOE has made screening with low-dose helical computed tomography (CT) scans available because many former workers are at risk for occupational lung cancer as a result of their work for DOE. Occupational hazards, such as asbestos, ionizing radiation, silica, beryllium, and diesel exhaust, may cause or contribute to the disease. Through the FWP, DOE initiated the Early Lung Cancer Detection (ELCD) program to detect lung cancers at an earlier, more treatable stage. Since 2000, the FWP's ELCD program has screened 14,961 participants and provided 45,097 CT scans. In FY 2015, 671 participants were screened and a total of 3,822 CT scans were performed; this includes baseline, followup, and annual scans.

The projects currently offering low-dose CT scans for early lung cancer detection include:

- WHPP, administered by Queens College of the City University of New York and the United Steelworkers, along with their partners;
- BTMed, conducted by CPWR in conjunction with their partners; and
- NSSP, administered by ORAU and their partners.

Other FWP projects are either exploring how to incorporate CT scanning into their current protocols or in the planning phases for initiating this component.

More in depth information regarding the ELCD program, including low-dose CT scans, can be found on the FWP Web site (http://energy.gov/ehss/early-lung-cancer-detection-program).

3. Communicate Results:

Provide medical screening exam results to participants, as well as information concerning any conditions that may require followup medical care with their personal physicians or specialists, and offer information regarding possible compensation for work-related illnesses.

Occupational medicine physicians review the results from the medical screening exams, along with the completed medical and occupational exposure history questionnaires, to determine whether any abnormal findings exist and whether the findings may have been caused by a work-related exposure. Participants requiring urgent medical attention for an abnormal test result are contacted immediately by phone, informed of the finding, and provided recommendations for further evaluation and treatment by their personal physicians or a specialist. Urgent findings are also documented in a letter to the participant that is sent by overnight mail.

Participants are provided with a summary of all the findings from their medical screening exam in a results letter several weeks after their examination, along with any necessary followup recommendations. Although the primary focus of the results letter is to provide a summary of any possible occupational-related findings and followup recommendations for those findings, the letter also includes a summary of non-occupational findings discovered during the screening. The results letter also includes general health advice for workers, such as recommendations for smoking cessation. Individuals who have any abnormal medical findings are referred to their personal physicians or a specialist for followup care. While the FWP projects offer medical screening exams, followup medical evaluation and treatment are not within the scope of the FWP.

When appropriate, the FWP physicians who write the results letters include language regarding the possible work-relatedness of a condition, especially if the condition is known to be a potential occupational disease. The inclusion of this language, known as “causation” language, can be very helpful for participants who decide to file a claim under the EEOICPA, which is administered by DOL. Moreover, participants are provided contact information for DOL EEOICPA Resource Centers in the results letters, as well as other State and Federal workers’ compensation programs when appropriate.

The FWP complements the EEOICPA by offering former DOE workers with detailed information about the possible relationship between their condition and their occupational exposure at a DOE site. In addition, FWP project staff, many of whom are former DOE workers, are able to assist participants by providing useful site and exposure information to include in their claims packages. While participation in the medical screening program is not required for filing a compensation claim, the medical results may be useful in supporting an EEOICPA claim.

4. Protect PII/PHI: Protect the confidentiality and privacy of participants.

The confidentiality and privacy rights of former workers are not only a legal requirement, they are crucial to establishing and maintaining credibility with the former worker community. All medical information that is collected as part of this program is treated as confidential and is used only as allowed by the Privacy Act of 1974 and the Health Insurance Portability and Accountability Act (HIPAA). All FWP activities are conducted with the approval of the Institutional Review Boards, or Human Subjects Committees, of DOE and involved universities. All individuals sign an informed consent and HIPAA authorization prior to participation. In addition, all program staff are required to take annual privacy awareness training, and all FWP projects have security procedures in place for the safe transmittal and storage of PII.

"When I retired in 2008 from working at the INL site, I was offered a free chest X-ray by the Worker Health Protection Program to scan for lung-related issues. In October of 2013, an ELCD CT scan showed a suspicious nodule on my lung, and a biopsy showed it was lung cancer. After having surgery, all the cancer was successfully removed. I've had no symptoms since, and had it not been for WHPP, the cancer very likely would have developed and spread. This program probably saved my life!

- Michael Graefe, former INL production worker

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3.0 Program Findings

A summary of medical examinations performed to date is presented in Tables 1-4 below. Only new abnormal findings on re-screen exams are reported. Suspected work-related findings have been primarily lung-related conditions (e.g., asbestosis and/or silicosis, beryllium sensitization, and lung cancer) and hearing loss.

Table 1. Chest X-ray Findings on Initial and Re-screen Exams (through September 2015)

Screening Exam	Workers Screened	Asbestos-related Lung Disease[2]	Silicosis[3]	Other Dust-related Disease[4]	Lung Nodules, Nodes, or Lesions[5]
Initial	73,616	8,823 (12.0%)	178 (0.2%)	1,083 (1.5%)	2,779 (3.8%)
Re-screen	24,158	1,643 (6.8%)	20 (0.1%)	287 (1.2%)	919 (3.8%)

Table 2. Spirometry Findings on Initial and Re-screen Exams (through September 2015)

Screening Exam	Workers Screened	Obstructive Airways Dysfunction Detected[6]
Initial	72,582	14,285 (19.7%)
Re-screen	24,290	3,572 (14.7%)

[2] Asbestos-related disease, or asbestosis, is a lung disease caused by breathing in asbestos fibers.
[3] Silicosis is a lung disease caused by breathing in silica dust.
[4] Mixed dust pneumoconiosis or pneumoconiosis, not otherwise specified.
[5] The presence of non-trivial parenchymal lung nodules, enlarged lymph nodes in the chest, or other lung or pleural abnormality that requires medical followup as suggested by the chest x-ray B-reader or the local radiologist.
[6] Obstructive airways dysfunction includes chronic obstructive pulmonary disease, which is a progressive lung disease caused by long-term exposure to lung irritants, such as cigarette smoke, air pollution, chemical fumes, or dust. Obstructive airways dysfunction also includes asthma, which is a chronic inflammatory disease of the bronchial tubes, or airways, that causes swelling and narrowing of the airways. It is thought to be caused by a combination of environmental and genetic factors.

Table 3. Results of BeLPTs on Initial and Re-screen Exams (through September 2015)

Screening Exam	Workers Screened	1 Abnormal[7]	2 Abnormal	1 Abnormal and 1+ Borderline
Initial	66,100	833 (1.3%)	826 (1.2%)	225 (0.3%)
Re-screen	20,422	160 (0.8%)	174 (0.9%)	78 (0.4%)

Table 4. Audiometry Findings on Initial Exam (through September 2015)

Workers Screened	Noise-induced Hearing Loss
64,886	38,544 (59.4%)

The results from the ELCD programs are summarized in Tables 5 and 6 below. The detected cancers have been staged – indicated by a descriptor (usually numbers I to IV) representing how much the cancer has spread. CT screening has led to cancers being detected at an early stage when treatment is more likely to be effective and has proved to be better for early detection than conventional chest x-rays.

Table 5. Stage of Lung Cancers Detected by WHPP, BTMed, and NSSP ELCD Program, 2000-September 30, 2015

Site of ELCD Program	Number of Participants Screened	Number of Lung Cancers Detected	Number of Detected Lung Cancers That Were Staged	Number (%) of Early (Stage I or II Non-Small Cell or Limited Small Cell) Cancers Detected[8]
FMPC (Production Workers)	444	2	2	1 (50%)
Hanford (Construction Workers)	278	6	6	5 (83%)
INL (Production Workers)	641	7	5	1 (14%)
K-25 (Production Workers)	2,855	28	28	23 (82%)

[7] Individuals with one abnormal BeLPT are encouraged to file a claim with the DOL EEOICPA. Beryllium sensitization is diagnosed by an occupational medicine physician based on abnormal BeLPT results.

[8] The stage of lung cancer is described using the TNM classification system according to the American Joint Committee of Cancer (AJCC Cancer Staging Manual. 7th Edition, 2010). Staging is based on pathology status, or clinical status if pathology status is not available.

Site of ELCD Program	Number of Participants Screened	Number of Lung Cancers Detected	Number of Detected Lung Cancers That Were Staged	Number (%) of Early (Stage I or II Non-Small Cell or Limited Small Cell) Cancers Detected[8]
Mound Plant (Production Workers)	608	5	5	4 (80%)
NNSS (All Workers)	646	3	3	2 (67%)
ORNL (Production Workers)	1,353	14	13	6 (43%)
Oak Ridge Reservation (Construction Workers)	414	9	5	2 (22%)
Miscellaneous Sites (All Workers)	158	3	1	1 (33%)
Paducah (Production Workers)	2,008	20	20	16 (80%)
Portsmouth (Production Workers)	2,262	21	21	16 (76%)
Rocky Flats (Production Workers)	95	1	1	1 (100%)
Savannah River Site (Construction Workers)	111	4	1	1 (25%)
Y-12 (Production Workers)	3,088	36	29	19 (53%)
Total	14,961	159	140	98 (62%)

The ELCD programs have also detected other diseases of importance (see Table 6).

Table 6. Other Diseases Found on CT Scan by WHPP, BTMed, and NSSP

Condition	Number Detected
Appendiceal cancer	1
Breast cancer	1
Kidney cancer	11
Liver cancer	2
Lymphoma	6
Thyroid cancer	5
Aortic aneurysms	44
Heart aneurysms	5

Condition	Number Detected
Splenic aneurysms	1
Pneumonia	67
Thymoma	5
Metastatic Melanoma	1
Mesothelioma	1

"I am totally grateful to the Worker Health Protection Program. When I retired from INL, I was offered a free physical and later a low dose CT scan of my lungs by WHPP. In January 2015, I had a scheduled yearly CT scan of my lung. I was notified that a nodule on my lung was looking suspicious for lung cancer. A biopsy was taken and I was diagnosed with lung cancer. I had surgery and afterward, I showed no cancer left in my body. All my doctors credited this success to the early detection by WHPP. I want to thank everyone who is responsible for and working with the WHPP and Early Lung Cancer Detection Program (ELCD). I was feeling great before I was diagnosed with cancer, I had no symptoms and now, I feel like I was given a new lease on life!"

- Loretta Moses, former INL production worker

4.0 Summary

DOE's FWP is a testament to the Department's commitment to its workforce and demonstrates the feasibility and value of conducting a targeted medical screening program for occupational diseases among DOE former workers by using third-party medical experts who provide high-quality services. DOE has made great advances in addressing the occupational health legacy of more than 70 years of nuclear weapons design and production, as well as other activities that may have exposed its workers to toxic substances. The exams offered by the FWP can provide important information on health conditions, which if caught early, may be treated with greater success. Participants found not to have work-related conditions during their exam receive the benefit of this reassurance.

In FY 2016, the Department, through the FWP, will continue to meet its obligation to its former workers by providing medical screening examinations to all those who are interested and eligible across the country. The FWP projects will continue to expand CT scanning for early lung cancer detection to other worker populations. In addition, DOE will maintain the program elements and practices that account for the program's high degree of success while building on lessons learned to continually improve program implementation.

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Appendix A: Individual Project Descriptions

The U.S. Department of Energy (DOE) Former Worker Program (FWP) projects are briefly described below.

Building Trades National Medical Screening Program (BTMed)

Who we are:

BTMed is administered by CPWR – The Center for Construction Research and Training (CPWR), the health and safety research center of the North America's Building Trades Unions, in partnership with Stoneturn Consultants, Duke University Medical Center, University of Cincinnati, and Zenith-American Solutions.

What we do:

BTMed identifies construction workers who have been employed on DOE sites and screens them for occupational illnesses. In addition to conventional medical screening services, BTMed also offers low-dose, computed tomography (CT) scans. Nearly 32,400 medical screenings and 2,100 low-dose CT scans have been delivered through a network of 200 specially credentialed clinics across the country. BTMed serves workers from 28 DOE sites (see map).

Findings:

- 18 percent demonstrated abnormal chest x-ray (CXR) findings.
- 40 percent demonstrated abnormal pulmonary function test (PFT) findings.
- 64 percent demonstrated hearing loss.
- 1.5 percent had at least one abnormal beryllium lymphocyte proliferation test (BeLPT).
- Twelve stage one lung cancers have been identified.

BTMed and Research:

Clearing the Air about COPD

COPD: An Under-rated Occupational Health Problem

Chronic Obstructive Pulmonary Disease – COPD – is a "catch-all" for several poorly differentiated diseases that obstruct the airways. COPD is a leading cause of death and also a leading driver of health care costs. Although less known, COPD is also a significant occupational health problem.

There are many things we don't understand about COPD. On the one hand, although smoking is the most significant risk factor, only about 15 percent of smokers develop COPD. On the other hand, many never-smokers also develop COPD.

Investigators compared the work histories of 834 BTMed participants with COPD to 1,243 controls who did not. Workplace exposures to an unhealthy combination of vapors, gases, dusts, and fumes (VGDF) accounted for nearly 1 in 5 COPD cases. Many workers with COPD had never smoked; one-third of these cases were attributable to workplace exposure.

A simplistic view of COPD in the workforce might lead employers to begin and end with smoking cessation efforts, but the evidence says otherwise. In construction, at least, occupational exposures remain a major cause of COPD, and we need to protect workers by getting VGDFs under control.

For more information: A Case-control Study of Airways Obstruction among Construction Workers. American Journal of Industrial Medicine, Vol. 58, 2015.
(Available at: https://www.btmed.org/doc/AJIM%20Airways%20Obstruction%202015.pdf).

Contact BTMed:

Toll-free number: 1-800-866-9663/1-888-464-0009

Web site: www.btmed.org

"The screening is very important. There were some problems I had that without the screening I would not know I had."

-Ben Creech III, former Savannah River worker

Laura S. Welch, MD

Medical Director, BTMed

CPWR

lwelch@cpwr.com

Dr. Welch, second from right, meets with staff from the Seattle Cancer Care Alliance to discuss low-dose CT scans.

Dr. Laura Welch serves as the Medical Director for CPWR, a research and development institute affiliated with the Building and Construction Trades Department of the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). She is a lecturer at George Washington University's Department of Environmental and Occupational Health. She previously held full-time faculty positions at the Albert Einstein, Yale University, and George Washington University Schools of Medicine.

She serves as a consultant to many Federal Agencies, including the Occupational Safety and Health Administration, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, and National Institutes of Health, and has many leadership roles in the American Public Health Association and Association of Occupational and Environmental Clinics. Dr. Welch provides occupational medicine expertise to the AFL-CIO, having worked with several union-management committees on health and safety issues. Her extensive work experience has led her to author over 100 peer-reviewed publications, abstracts, and technical reports.

As CPWR's Medical Director, Dr. Welch manages two national medical screening programs for construction workers. She is the principal investigator for the Early Lung Cancer Detection Program for construction workers, which is part of BTMed. She is also responsible for a nationwide screening program for sheet metal workers. She received her medical degree from the State University of New York at Stony Brook.

Knut Ringen, DrPH, MHA, MPH
Principal Investigator, BTMed
CPWR
knutringen@msn.com

With more than 40 years of experience in public health administration, Dr. Knut Ringen can be considered one of the founders of the field of occupational high risk management. Due to his intensive studies of issues within one of the most high-risk industries in the world, he is an expert in construction safety and health. In 1996, he used this experience to establish the first medical screening program for former DOE construction workers, which evolved into the BTMed. The BTMed program, which serves construction workers from 28 DOE sites across the country, has delivered in excess of 30,000 screenings to date.

In 1979, Dr. Ringen launched three projects to demonstrate that medical screenings among workers known to have been exposed to work-related health hazards could identify occupational illnesses and could help these workers secure their rights and prevent a premature death. When growing evidence from scientific studies and concerns expressed by workers suggested that DOE working conditions were hazardous, Dr. Ringen advocated for a special focus on construction workers, as these workers were usually employed by subcontractors and were more likely to be assigned to the most hazardous duties. Using the data collected from these medical screenings, Dr. Ringen and others could show how effective this model of medical screening and assistance was and why it should be applied to construction workers on DOE sites. This scientific analysis helped encourage Congress to enact legislation in 1993 that forms the basis for DOE's FWP.

BTMed has saved lives, helped workers and their families with compensation, and demonstrated to DOE that construction workers need better safety and health protections. It is well appreciated by the participants.

BTMed is administered by CPWR (cpwr.com), a 501(c 3) non-profit research institution, which serves as the research arm of Building and Construction Trades Department, AFL-CIO.

Dr. Ringen was the first executive director of CPWR and currently is its senior science advisor. He has directed other non-profit health organizations and has worked at the National Academy of Sciences and the National Cancer Institute. Among many honors, he is a fellow of the European Academy of Sciences and the Collegium Ramazzini, the international society of scholars in environmental and occupational health. He has a Master's in Hospital Administration from the Medical College of Virginia (now a part of Virginia Commonwealth University) and PhD and Master's degrees in Public Health from Johns Hopkins University (JHU).

THE PANTEX FORMER WORKER MEDICAL SURVEILLANCE PROGRAM
Conducted by the Drexel University School of Public Health

The Pantex Former Worker Medical Surveillance Program

Who we are:

- Primary: Drexel University School of Public Health
- Outreach: Department of Occupational Health Sciences, The University of Texas Health Science Center at Tyler (UTHSCT), Texas
- Clinical Services: West Texas A&M Health Partners Clinic, Amarillo, Texas

What we do:

- The Pantex Former Worker Medical Surveillance Program offers former Pantex Plant employees and contract workers the opportunity to obtain an independent, objective assessment of their health in relation to their workplace exposures by a health care provider experienced in occupational medicine.
- Participants are scheduled for an appointment at a time convenient for them at the Health Partners Clinic in Amarillo, which is affiliated with a university nursing program. Former workers that live outside the Amarillo area are referred to the National Supplemental Screening Program.
- Each participant completes an occupational exposure history, as well as past medical history, prior to having their medical screening examination.
- The screening exam may include some or all of the following tests: physical exam, chest x-ray with ILO B-read, spirometry, Beryllium Lymphocyte Proliferation Test (BeLPT), blood chemistry tests, and urinalysis.
- Former workers who participate in the program receive results of their clinical exam and medical tests in a personalized “results letter” from a board certified occupational medicine physician, along with any necessary followup recommendations.
- The screening process is an opportunity for former workers to receive additional wellness information and support for lifestyle changes to improve their health and quality of life.
- Each participant is offered the opportunity to return for a “re-screening” exam every 3 years; the re-screening exam is focused on previous findings and any new health developments.
- Students from multiple disciplines, including sports and exercise science, undergraduate and graduate level nursing, health sciences, and medical assistant programs, are provided educational opportunities by participating in clinic activities. This is a unique opportunity for students of health care professions to learn about occupational medicine.

What we have found:

- CXRs: 6.1 percent had findings consistent with work-related lung disease.
- CXRs: 5 percent had suspicious lung nodules or lesions.
- PFTs: 42 percent had findings consistent with obstructive disease.
- BeLPTs: 1.2 percent had at least one abnormal BeLPT.
- Audiometry: Audiometry is not part of the Pantex former worker screening protocol.
- Our Participation Surveys continue to show 99 percent satisfaction with the program.

Toll-free number: 1-888-378-8939

Arthur Frank, MD, PhD, spoke to about 150 former Pantex workers at the Joint Outreach Task Group Town Hall meetings on July 23, 2015.

"They were all very nice and informative excellent people. If not for them, I would not have known all that was wrong with me. Thank you for all your concerns and kindness."

- former Pantex worker

The Pantex Former Worker Medical Surveillance Program

THE PANTEX FORMER WORKER MEDICAL SURVEILLANCE PROGRAM
Conducted by the Drexel University School of Public Health

Arthur L. Frank MD, PhD

Dr. Frank is a Professor of Public Health at the Drexel University School of Public Health in Philadelphia. He is also Chair Emeritus of the Department of Environmental and Occupational Health. He holds faculty positions as Professor of Medicine and as Professor of Civil, Architectural, and Environmental Engineering. His medical degree is from the Mount Sinai School of Medicine (1972), and his PhD in Biomedical Sciences is from the Mount Sinai campus of the City University of New York (1977). He worked at Mount Sinai with Dr. Irving Selikoff and, since his days as a medical student, has been continuously engaged in research regarding the health effects of asbestos. His professional interests involve exposure to other dusts and to carcinogens in general. He has also worked in the area of agricultural safety and health. Dr. Frank has taught at Mount Sinai, the University of Kentucky, and in the University of Texas system before joining the faculty at Drexel. He is boarded in both internal medicine and occupational medicine and has served as an advisor to such organizations as the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the Environmental Protection Agency, and the Centers for Disease Control and Prevention. He has been a consultant to companies and unions. He has done work internationally, including in China, India, and Mongolia. He has published some 200 publications, many related to asbestos, and served many publications as an editor and reviewer.

The Pantex Former Worker Medical Surveillance Program

THE PANTEX FORMER WORKER MEDICAL SURVEILLANCE PROGRAM
Conducted by the Drexel University School of Public Health

C. David Rowlett, MD, MS, FACOEM

Dr. Rowlett joined the Department of Occupational Health Sciences at UTHSCT as an Associate Professor in 2010 and began working with the Pantex former worker program in 2014. In addition, he serves as medical director of both employee health and of the occupational health clinic at UTHSCT. He also serves as part-time medical director for Eastman Chemical Company. Prior to UTHSCT, Dr. Rowlett was first a designated physician and then the site occupational medical director at the Pantex Plant, Amarillo, Texas, from 2003-2009. Dr. Rowlett received an MS in Chemical Engineering from Texas Tech University, Lubbock, Texas, in 1977, after which he served on active duty as a research engineer for the U.S. Army. After 4 years on active duty, he entered industry in 1981 as a process engineer and technical superintendent. After 3 years in industry, he returned to Texas Tech where he received his MD in 1987. He completed an MS in Preventive Medicine in 1989 and an occupational medicine residency in 1990 at The University of Iowa, Iowa City, Iowa. He returned to industry with Exxon Company USA, serving as medical director of the Baytown refinery, Baytown, Texas, 1990-1993. Following this, Dr. Rowlett spent a decade in multispecialty group practice, first with Scott & White Clinic, Temple, Texas (1993-1999) and then with the Covenant Medical Group, Lubbock, Texas (1999-2003) before joining Pantex.

While at Scott & White, Dr. Rowlett served as an assistant professor at Texas A&M University with appointments in the College of Medicine, Nuclear and Safety Engineering/Industrial Hygiene, and the NSF Ergonomics Center. During this time, Dr. Rowlett became a member of the American College of Occupational and Environmental Medicine's (ACOEM) Practice Guidelines committee where he served for almost a decade. He was a contributing editor and a chapter lead for the second addition of the "Guidelines." His presentations and publications span the fields of industrial hygiene, toxicology, engineering, safety and surety, as well as evidence-based practice of medicine. He is board certified in occupational medicine and a fellow of ACOEM.

Medical Exam Program for Former Workers from Los Alamos National Laboratory and Sandia (New Mexico) National Laboratories

Who we are:

- Johns Hopkins Bloomberg School of Public Health (JHBSPH)
- University of New Mexico (UNM)

What we do:

- Provide medical screening exams to all interested former workers from Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL).
- The JHBSPH Medical Exam Program is one of several unique programs within the DOE FWP. Examinations are done in New Mexico in Espanola, New Mexico, and Albuquerque, New Mexico, by occupational health professionals from JHBSPH and UNM.
- Examination sessions are scheduled over a 2-day or 3-day period two to three times per year. Physicians, health care providers, and occupational health professionals travel from Baltimore, Maryland; Espanola, New Mexico; and Albuquerque, New Mexico, to the examination site to conduct physical examinations.
- During examination sessions, former workers have the opportunity to meet with the program occupational medicine physician to discuss their examination results and to ask questions.
- Each participant has a detailed exposure and medical history interview prior to their initial examination and a short medical history interview before their re-examination. These interviews are conducted by a former worker from LANL.
- The program staff assists former workers with workers' compensation claims and, when appropriate, writes letters in support of claims for Federal compensation for former workers from both sites.
- The project has completed 4,008 examinations of former workers since the program began in 2000. Of these exams, 3,394 were new exams, and 614 were re-examinations of former LANL workers for past exposures to asbestos, beryllium, and radiation, and SNL former workers for past exposure to asbestos, beryllium, radiation, and silica.
- On exit surveys, over 97 percent of program participants stated that they were satisfied with their overall evaluation, and 97 percent would recommend the program to other former workers.
- The program works with the Joint Outreach Task Group to develop outreach strategies to recruit former workers who are eligible for the medical screening program and the Energy Employees Occupational Illness Compensation Program Act.
- Over the past year, we were unable to participate in Department of Labor Town Hall Meetings in New Mexico, but we sent brochures for both programs to the Espanola Resource Center for the Town Hall Meetings.
- We participated in the New Mexico Day at the Legislature in Santa Fe, January 2015. At this meeting we discussed the program with the state legislators.

What we have found:

- CXRs: 12.0 percent have findings consistent with work-related lung disease;
- PFTs: 2 percent demonstrated findings consistent with obstructive disease;
- BeLPTs: 3.4 percent had at least one abnormal BeLPT; and
- Audiometry: 55 percent demonstrated hearing loss for normal speech tones.

Toll-free number: 1-877-500-8615

Web site: http://www.jhsph.edu/lanlfw/

Maureen Cadorette, PhD, COHN-S

Dr. Cadorette has been a nurse for over 40 years. She graduated from Nursing School in 1972 and completed a Bachelor's degree in nursing in 1992. She has a Master's in Public Health (1994) and a PhD in Occupational and Environmental Health (2005) from JHU. She has worked in many areas of nursing, but Orthopedics was her longest stint, and she was at one time certified in Orthopedic Health Nursing. Today, she is a Certified Occupational Health Nurse. She has worked at JHU as a staff member and an Assistant Scientist since 1997, and she has worked in Occupational Health for 20 years. She is on the Faculty of the Education and Research Center at JHBSPH. They are funded by the National Institute for Occupational Safety and Health, and they educate occupational health professionals. She has been with the FWP since 1997 as a project coordinator and now as a Co-Principal Investigator. She manages the day-to-day activities of the program and works with their staff in New Mexico to keep the program working smoothly.

Brian S. Schwartz, MD, MS

Dr. Schwartz is a Professor in the Department of Environmental Health Sciences in the JHBSPH. He is jointly appointed in the Department of Epidemiology in the School of Public Health and in the Department of Medicine in the School of Medicine. He joined the faculty at Johns Hopkins as an Assistant Professor in 1990 and was promoted to Professor in 2001. He served as Director of the Division of Occupational and Environmental Health from 1996 to 2006 and as Director of the Occupational and Environmental Medicine Residency from 1993 to 1998, for which he is currently Co-director. He is a board-certified specialist in internal medicine and occupational and environmental medicine. Dr. Schwartz has been evaluating patients concerned about occupational and environmental diseases since 1990 in the Johns Hopkins Center for Occupational and Environmental Health. He also has an active research program on how metals, solvents, other chemicals, industrial processes, and environmental and community conditions can affect health. Dr. Schwartz has been the leader or co-leader of the FWP at LANL and SNL since 2000. The two programs take a unique approach in that program health care providers perform all the examinations themselves. The two programs have completed over 4,000 examinations of former workers.

Who we are:

The National Supplemental Screening Program (NSSP) is managed by Oak Ridge Associated Universities (ORAU) with a team from:

- National Jewish Health;
- University of Colorado Denver, Center for Worker Health and Environment, Colorado School of Public Health;
- Comprehensive Health Services, Inc.; and
- Axion Health, Inc.

What we do:

- Since 2005, the NSSP provides medical screening examinations to former Department of Energy (DOE) employees from eight primary DOE sites:
  - Argonne National Laboratory;
  - Fermi National Accelerator Laboratory;
  - Hanford;
  - Kansas City Plant;
  - Princeton Plasma Physics Laboratory;
  - Pinellas;
  - Rocky Flats;
  - Savannah River Site; and
  - **41 other DOE Sites,** including:
    - » Medical examinations for former DOE site employees where no DOE FWP has been assigned; and
    - » Referrals (production, construction and building trades) from the other FWPs whose participants may live outside of their respective medical screening coverage areas.
- The NSSP provides the opportunity for participants to receive a re-screening medical examination every 3 years.
- The NSSP provides DOE former workers exposure-based medical screening examinations and also provides screening tests and procedures to identify medical conditions that are non-occupational in origin. As a consequence, former workers have the opportunity to receive wellness information and support for lifestyle changes to improve their health and quality of life.
- The NSSP provides DOE former workers with assistance in regards to filing Energy Employees Occupational Illness Compensation Program (EEOICP) benefit claims with the Department of Labor (DOL).
- In 2013, the NSSP began a Low-Dose Computed Tomography (LDCT) Pilot Program to detect lung cancer at an early stage, as well as work-related lung diseases and other medical conditions, in approximately 100 NSSP participant volunteers who live in the greater Denver metro area. The NSSP LDCT Pilot Program is based on the National Comprehensive Cancer Network's Clinical Practice Guidelines.
- In 2014, the NSSP LDCT Pilot Program completed the first round of LDCTs for 98 NSSP participants representing the Rocky Flats Plant, Kansas City Plant, Idaho National Laboratory (INL), and the Nevada National Security Site. LDCTs and radiology evaluations were performed at National Jewish Health, Denver, Colorado. The NSSP continues to provide annual LDCTs to Pilot Program participants.
- More than 99 percent of the responding NSSP participants were satisfied with their experience in the NSSP.

What the NSSP has identified:

- The NSSP has provided initial medical screening examinations to 14,624 former DOE employees representing 49 DOE Sites, and has also provided re-screening examinations to nearly 2,182 former workers.
- Chest X-rays (with B-Read interpretation):
  - 10.7 percent had findings consistent with asbestos-related lung disease
  - 3.5 percent had suspicious lung nodules or lesions identified
  - 0.2 percent had lung cancer diagnosed
- Pulmonary Function Tests:
  - 19.8 percent had findings consistent with restrictive lung disease
  - 17.9 percent had findings consistent with obstructive lung disease
- BeLPTs: 3.0 percent had at least one abnormal BeLPT
- Audiometry: 43.1 percent demonstrated hearing loss for normal speech tones
- LDCT Pilot Program
  - 98 - NSSP participants completed an initial LDCT
  - 88 - NSSP participants completed an annual LDCT
  - 1 - diagnosed lung cancer
  - 12 - participants with nodules suspicious for lung cancer
  - 8 - participants with indeterminate nodules
  - 15 - participants with non-cancerous findings that require followup

NSSP Toll-free number:

1-866-812-6703

NSSP Web site:

http://www.orau.org/nssp

"Everyone involved in my screening was very helpful, friendly, informative, and professional. I thank you for the opportunity to have this examination."

- former Los Alamos National Laboratory worker

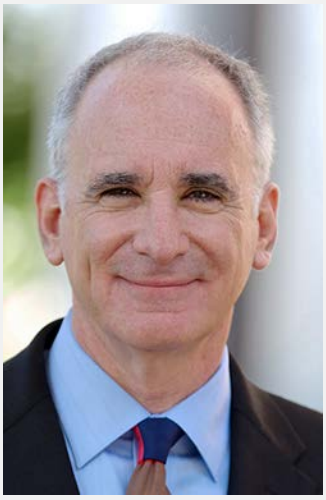
Donna L. Cragle, PhD

Dr. Cragle is the Senior Vice President and Director, Health, Energy and Environment, at ORAU. She has been involved with research of occupational hazards in DOE facilities for 35 years. The primary focus of her research has been in the area of occupational epidemiology, with particular interest in radiation and beryllium exposures. She has worked on numerous international projects, including an international committee to assess the body of data related to human health effects related to nickel exposure. She also worked on a data preservation effort for an international radiation epidemiology project involving health effects of radiation exposure. Dr. Cragle has also been involved in decision making related to maintenance of the large worker databases. She has extensive experience with large-scale studies involving data from multiple worker populations. She has assisted outside researchers in their access to worker data and worked collaboratively with these researchers to facilitate their understanding of the data. Dr. Cragle's knowledge of occupational epidemiology has resulted in teaching opportunities both nationally and internationally. Her publications have provided significant contributions to the occupational epidemiology literature. Dr. Cragle received her Bachelor of Arts degree in biological sciences from Indiana University and her Masters of Science in human genetics from Virginia Commonwealth University. Dr. Cragle received her PhD in environmental epidemiology from the University of North Carolina-Chapel Hill.

John R. McInerney, MD

Dr. McInerney is a physician with ORAU, manager of the ORAU Arvada Office, and is the Co-Principal Investigator of the NSSP and the NSSP LDCT Pilot Program. Dr. McInerney coordinates the NSSP evaluation tests and procedures and participant education and results notification with the occupational physicians and radiologists at the University of Colorado Denver and National Jewish Health. He is residency-trained and board-certified in Emergency Medicine and Occupational Medicine and practiced in the Emergency Departments of major hospitals in Detroit, Chicago, Minneapolis, and Denver. Dr. McInerney served 3 years as a commissioned officer in the Indian Health Service providing medical and urgent care to the Hopis and Navajos at a remote hospital in northeastern Arizona. Dr. McInerney owned and operated a medical care facility in Golden, Colorado, for 15 years that provided emergency, general, and occupational medical services to the surrounding community. He served as an elected Golden, Colorado, city councilman for 8 years and was the Colorado School of Mines team physician for 25 years. Prior to accepting the position with ORAU, he worked as a physician at the DOE Rocky Flats Plant for 10 years, the last 7 of which he was the DOE Rocky Flats Site Occupational Medical Director. Dr. McInerney has also served as an advisor on DOE health-related committees and continues his interaction with the DOE Site Occupational Medicine Directors regarding NSSP former DOE worker findings.

Lee S. Newman, MD, MA, FCCP, FACOEM



Dr. Newman is Professor of Environmental and Occupational Health in the Colorado School of Public Health, University of Colorado Denver. He is Director of the Center for Worker Health and Environment, Director of the NIOSH-supported Mountain and Plains Education and Research Center, and is Chief Medical Informatics Officer (CMIO) of Axion Health, Inc. Dr. Newman is also a Professor of Medicine in the Division of Allergy and Clinical Immunology and Division of Pulmonary Sciences and Critical Care Medicine in the School of Medicine at the University of Colorado Denver, Anschutz Medical Campus. Dr. Newman serves as the Co-Principal Investigator of the NSSP. In his role as founder and CMIO of Axion Health, Dr. Newman led the team in the development of the highly secure software system that has been used by the NSSP since 2005 to efficiently conduct former energy worker exams throughout the country. He has also served as an advisor to many Federal Agencies, including the DOE, the Department of Labor Energy Employees Occupational Illness Compensation Program Act, the National Institutes of Health, the Food and Drug Administration, the Environmental Protection Agency, and the Centers for Disease Control and Prevention. Dr. Newman is board certified in internal medicine and pulmonary medicine and is an internationally renowned expert on occupational and environmental lung disorders. Dr. Newman is recognized for his contributions to our understanding of how beryllium affects the immune system. As the former Chief of the Division of Environmental and Occupational Health at National Jewish Health, he pioneered the use of the Beryllium Lymphocyte Proliferation Test and was instrumental in bringing this test into routine use for both clinical diagnosis and screening of beryllium-exposed workers leading to the current clinical definition of beryllium sensitization and Chronic Beryllium Disease. Dr. Newman received his Bachelor of Arts degree in psychology from Amherst College and his Masters of Arts degree in social psychology from Cornell University Graduate School of Arts and Sciences. He earned his MD from Vanderbilt University School of Medicine, completed internship and residency in Internal Medicine at Emory University School of Medicine, and pulmonary fellowship at the University of Colorado Denver/National Jewish Health.

Worker Health Protection Program (WHPP)

Who we are:

The WHPP is administered by the Barry Commoner Center for Health and the Environment at Queens College of the City University of New York, in conjunction with the United Steelworkers, the Atomic Trades and Labor Council in Oak Ridge, and the Fernald Medical Screening Program. Screening is conducted through partnerships with medical groups located within local DOE communities, including Kaiser Permanente in Northern California and the University of Nevada School of Medicine's Department of Family and Community Medicine in Las Vegas, Nevada.

WHPP employs a small network of former and current DOE workers as "local coordinators" to conduct outreach and assist with program operations in the DOE communities where medical screening occurs. Activities of local coordinators include conducting outreach at community events, scheduling and assisting with program registration, answering medical screening questions, liaising with local site offices and worker groups, advising on the development of program materials, and providing appropriate guidance regarding the EEOICPA claims process. Local coordinators have been an essential component in the recruitment of the DOE workers who have participated in over 31,000 initial examinations and over 52,000 total examinations through WHPP.

What we do:

The consortium utilizes expert occupational medicine physicians and support staff to provide independent medical screening to workers who are at risk of illnesses related to their work from 14 DOE sites. In addition to the standard FWP medical screening, WHPP administers the Early Lung Cancer Detection (ELCD) program with low-dose CT scans at nine DOE sites.

WHPP provides both FWP medical screening and the ELCD program to workers from:

- Idaho National Laboratory (Idaho)
- Paducah Gaseous Diffusion Plant (GDP) (Kentucky)
- Nevada Test Site, now called the Nevada National Security Site (Nevada)
- Fernald (Ohio)
- Mound (Ohio)
- Portsmouth GDP (Ohio)
- K-25 GDP (Tennessee)
- Oak Ridge National Laboratory (Tennessee)
- Y-12 National Security Complex (Tennessee)

Standard FWP medical screenings only are provided to workers from:

- Lawrence Berkeley National Laboratory (California)
- Lawrence Livermore National Laboratory (California)

- Sandia National Laboratories (California)
- Waste Isolation Pilot Plant (New Mexico)
- Brookhaven National Laboratory (New York)

What we have found:

FWP medical screening

- CXRs (N=50,240): 5.19 percent demonstrated findings consistent with work-related lung disease (total percentage of CXR abnormalities in the following categories: asbestosis without pleural disease, asbestosis with pleural disease, asbestos-related pleural disease, silicosis, mixed dust pneumoconiosis, and pneumoconiosis not otherwise specified)
- PFTs (N=50,896): 17.23 percent demonstrated findings consistent with obstructive disease (percentage of PFT abnormalities – obstructive pattern and mixed pattern combined)
- BeLPTs (N=42,481): 2.38 percent had at least one abnormal BeLPT (total percentage of BeLPT abnormals – 1, 2 or 1 and 1+ borderlines)
- Audiometry (N=28,380): 59.90% demonstrated occupational hearing loss.

ELCD program

- 136 ELCD program participants have been diagnosed with primary lung cancer.
- 90 of the 126 (71 percent) individuals whose lung cancers have been staged, to date, had an early stage lung cancer (Stage 0, I, or II non-small cell or limited small cell) at the time of diagnosis.
- Lung cancer was detected in one of approximately 102 DOE workers tested (N=13,903).

Toll-free number: 1-888-241-1199

Web site: http://worker-health.org

Facebook: www.facebook.com/WorkerHealthProtectionProgramwhpp

"I am very grateful that I participated in the Worker Health Protection Program. If it had not been for the exam, my outcome could have been much worse. I had no symptoms when I went to my screening, but findings from the exam led to the eventual diagnosis of early stage lung cancer. After successfully undergoing treatment and recovery, I have regained much of my strength and most days, I pretty much forget that I was ever a lung cancer patient."

- Irva Hertz-Picciotto, PhD, former Lawrence Berkeley National Laboratory worker

Steven Markowitz, MD, DrPH

Steven Markowitz, MD, DrPH, an occupational medicine physician and epidemiologist, directs the Barry Commoner Center for Health and the Environment at Queens College, City University of New York. He is Adjunct Professor of Preventive Medicine at Mount Sinai School of Medicine. He received his undergraduate education at Yale University, his medical degree and doctorate in epidemiology from Columbia University, and completed residencies in internal medicine at Montefiore Hospital and in occupational medicine at Mt. Sinai School of Medicine.

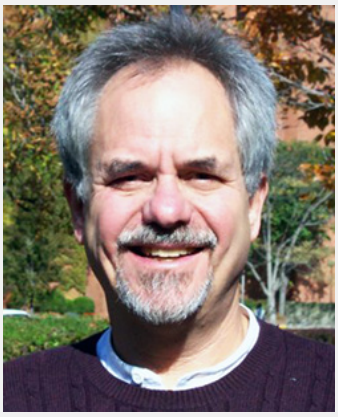
In 1996, Dr. Markowitz worked with the DOE, other physicians, and labor unions to establish the DOE FWP. Under these auspices since 1997, Dr. Markowitz has co-directed *WHPP*, a national medical screening program for former DOE nuclear weapons workers at 14 DOE sites in 8 States. Program collaborators include the United Steelworkers and the Oak Ridge and Fernald Atomic Trades & Labor Councils.

Dr. Markowitz has conducted research in the areas of occupational cancer, asbestos-related diseases, immigrant occupational health and surveillance of occupational injuries and illnesses, publishing over 90 journal articles and book chapters. Earlier in his career, Dr. Markowitz directed the occupational medicine residency at Mount Sinai School of Medicine and initiated an NIH-funded training for medical students and a Fogarty Center-funded international occupational health fellowship in Mexico, Brazil, and Chile. For more than a decade, he has worked with community groups in New York City to address immigrant occupational health, providing medical screening in 2002 for Latino day laborers who worked near Ground Zero, documenting health and safety problems of immigrant restaurant workers in New York City, and training and equipping 500 Latino day laborers to perform Hurricane Sandy cleanup work.

Dr. Markowitz is Editor-in-Chief, *American Journal of Industrial Medicine* and Associate Editor of a major textbook, *Environmental and Occupational Medicine (4th edition)* (2007). He currently serves as Chair of the Advisory Board on Toxic Substances and Worker Health for Part E of the Energy Employees Occupational Illness Compensation Program Act. He also serves on the Board of Scientific Counselors of the National Toxicology Program and on the National Institute for Occupational Safety and Health, Scientific and Technical Advisory Board of the World Trade Center Health Program. He has served as a consultant to the World Health Organization and the Pan American Health Organization. He founded and directed the World Trade Center Clinical Center of Excellence based in Queens.

Founded in 1966, the Barry Commoner Center for Health and the Environment is an environmental and occupational health institute at Queens College, City University of New York, the nation's largest public university. The Center addresses real world problems, involves affected communities, and seeks to find achievable solutions.

Dr. Lewis Pepper, MD, MPH



Dr. Pepper came to WHPP at Queens College in 2011 after 20 years at the Boston University School of Public Health. Since coming to Queens College, he has served as the Associate Medical Director of the WHPP. Dr. Pepper has been interested in beryllium-related health effects. He has co-authored a paper examining beryllium exposure at the Nevada Test Site, and most recently was a member of the American Thoracic Society's *Ad Hoc Committee on Beryllium Sensitivity and Chronic Beryllium Disease* assisting in their June 2014 Statement on Beryllium Disease.

Dr. Pepper was the Principal Investigator of the National Institute for Occupational Safety and Health-funded studies of lead exposure among bridge construction workers and the health impacts of workplace reorganization and downsizing at DOE. The latter study involved almost 6,000 employees at five DOE facilities.

Currently, Dr. Pepper is an Adjunct faculty member of the Hunter School of Public Health of the City University of New York.

James Frederick

Jim Frederick is the Assistant Director of the Health, Safety & Environment Department (HSE) of the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union (USW). Jim has been with the USW since 1994, working at the Pittsburgh headquarters. Jim is a member of USW local union 9305. He has a Bachelor's degree in environmental health from Purdue University and a Master's degree in environmental health and safety management from Rochester Institute of Technology.

The USW is the largest industrial union in North America and has 850,000 members in the U.S., Canada, and the Caribbean. It represents workers employed in the metals, rubber, chemicals, paper, energy, government, and service sectors.

The USW HSE Department's primary task is to assist the union's membership through their local unions in protecting their health and safety and maintaining environmental health for the communities in which our members and their neighbors live. The USW HSE Department is comprised of 27 full-time staff and more than 300 local union trainers and activists working part-time for the USW HSE Department on an ongoing basis.

Jim's work for the USW includes:

- providing health, safety, and environmental assistance to the membership;
- coordinating workplace health and safety audits, as well as fatality and catastrophic incident investigations at USW-represented facilities;
- facilitating health, safety, and environmental negotiations with various USW employers;
- providing a range of training programs to local union health and safety activists, employers, and others;
- working with government representatives and other organizations to improve workplace health, safety, and environmental protections;
- providing oversight of health, safety, and environment conferences for the members of the union; and
- serving as the principal investigator on cooperative grant programs for the USW's Tony Mazzocchi Center for Health, Safety, and Environmental Education.

Former Burlington Atomic Energy Commission Plant (BAECP) and Ames Laboratory Workers Medical Screening Program

Who we are:

The University of Iowa College of Public Health

What we do:

The University of Iowa College of Public Health administers medical screenings to former nuclear weapons workers from two DOE facilities in Iowa: the BAECP/Line 1/Division B at the Iowa Army Ammunition Plant (IAAP) in West Burlington, Iowa, operational between 1949 and mid-1975, and the Ames Laboratory at Iowa State University in Ames, Iowa, established in the early 1940s.

Approximately 7,000 workers were employed in the manufacture and disassembly of nuclear weapons at BAECP with an estimated 5,684 still living; 7 percent of those do not live in Iowa and are being referred to the NSSP for screenings. Medical screenings for BAECP workers began in 2002. As of September 30, 2015, a total of 1,371 former workers have been screened with 799 receiving a 3-year repeat screening, 440 a 6-year, 169 a 9-year, and 28 a 12-year repeat screening.

In the early 1940s, the Ames Laboratory developed the process for purifying uranium metal for nuclear reaction purposes for the Manhattan Project. Overall, the Laboratory produced over 2 million pounds (1,000 tons) of high-purity uranium for the nuclear weapons industry. The Ames Laboratory presently conducts a broad range of applied chemical and physical research.

Over 13,000 employees worked at the Ames Laboratory, and 10,516 of those workers are still living and have known addresses; 72 percent do not live in Iowa and are being referred to NSSP for screenings. Medical screenings for former Ames Laboratory workers began in 2006. As of September 30, 2015, a total of 1,925 former workers have been screened with 844 receiving a 3-year repeat screening, 292 a 6-year, and 8 a 9-year repeat screening.

What we have found:

- CXRs: 475 (16 percent) former workers demonstrated findings suspicious for work-related lung disease (n=3,028).
- PFTs: 321 (10 percent) former workers demonstrated findings consistent with obstructive lung disease and 819 (26 percent) had findings consistent with restrictive lung disease (n=3,093).
- BeLPTs: 100 (3 percent) former workers had at least one abnormal BeLPT (n=3,144).
- Uncontrolled Hypertension Detected: 511 (24 percent) former workers were hypertensive; 19

(0.9 percent) had urgent/severe hypertension (blood pressure >180/110); and 2 (0.09percent) had emergent hypertension (blood pressure >220/140), n=2,166.

- Uncontrolled Diabetes Mellitus Detected: 163 (5 percent) former workers had hyperglycemia (non-fasting glucose ≥ 200mg/dL), n=3,112. 138 (12 percent) former workers indicated fair control of their diabetes (hemoglobin A1c 7.1-9.0), and 23 (2 percent) had poor control (A1c ≥ 9.1), n=1,129.
- Cancers: 123 (4 percent) former workers have been newly diagnosed with a cancer since having their screening, with the greatest number of newly diagnosed cancers being skin cancer (35 cases) followed by lung cancer (29 cases), n=3,296.
- Sarcoid lung disease: 5 of the BAECP former workers and 11 of the Ames Laboratory former workers were found to have a history of pulmonary sarcoidosis.

Toll-free number: 1-866-282-5818

Web site: www.iowafwp.org

"I am so very thankful for the screening program that the Former Worker Program offers every 3 years. This program has saved my life twice. Over 10 years ago, through the liver testing with your program, I found out I had Hepatitis C because of blood transfusions I got many years ago. Then in 2013, I found out I had colon cancer which was discovered because of finding out I was anemic through your program.

I need to say that all the people who have worked with me who are on staff are so very kind and helpful! Thank you again—I'm very grateful for the program."

- former Iowa Army Ammunition Plant worker

Laurence Fuortes, MD, MS

Laurence Fuortes, MD, MS, is a Professor of Occupational and Environmental Health and Internal Medicine at The University of Iowa. He is an occupational medicine physician with over 30 years of clinical experience and has directed the University Employee Health Clinic for 25 years. Dr. Fuortes teaches courses in environmental toxicology and international health and mentors graduate students, medical students, and occupational medicine residents in the Pulmonary Division Outpatient Clinic at the University Hospitals.

He has been the Principal Investigator of the FWP at The University of Iowa College of Public Health since its inception in 2000, which provides screenings to the two DOE sites in Iowa: IAAP and Ames Laboratory. In addition to evaluating the former workers at the medical screening, Dr. Fuortes provides thorough assistance with recommendations for follow-up care and conducts Energy Employees Occupational Illness Compensation Program impairment evaluations for former DOE workers. His personalized attention has been greatly appreciated by the workers and was recognized in receiving The University of Iowa Brody Service Award. Dr. Fuortes has also directed studies of the health effects of Department of Defense conventional weapons workers from the IAAP.

With over 90 peer-reviewed publications, Dr. Fuortes has been an investigator on numerous occupational and environmental public health programs, many with major service components, such as pesticide toxicology in agricultural workers, traumatic head and spinal cord injury epidemiology, and health services delivery to Iowa migrant farm workers. Dr. Fuortes also served as an Internist with the Indian Health Service and an Epidemic Intelligence Service Officer and has been involved with extensive global occupational health initiatives as well, including serving as a World Health Organization/Fulbright Lecturer in Costa Rica and a Senior Fulbright Scholar in South Africa and Armenia, as well as directing Fogarty international research-training programs.

Marek Mikulski, MD, PhD, MPH

Dr. Mikulski is an Adjunct Assistant Professor and Research Scientist in Occupational and Environmental Health at The University of Iowa. He received his PhD and MPH degrees from the University of Iowa and MD from the Medical University of Lodz, Poland. Dr. Mikulski is an occupational epidemiologist with over 18 years of research experience, including studies of health effects of exposures in nuclear and conventional munitions production, adverse birth outcomes from use of pesticides, and effects of age on assessment of pulmonary function. His research interests include a broad area of work-related lung disease, with specific interest in epidemiology and novel, computer-based methods used in diagnosing lung disease. Dr. Mikulski has published extensively and delivered presentations in these areas both at national and international meetings. He has also been an investigator on several occupational health/occupational medicine studies and projects, including those on the training programs in Europe where he served on the Board of the European Association of Schools of Occupational Medicine.

Dr. Mikulski has been a Co-Principal Investigator on the Iowa Former Worker Program since 2008 and has been actively involved in studies of health effects of Iowa Department of Defense conventional munitions workers. Dr. Mikulski is also a liaison with Department of Labor, Department of Energy, and congressional representation from the State of Iowa for issues relating to exposure profile and verification of employment for Energy Employees Occupational Illness Compensation Program (EEOICP).

Appendix B: Exams Conducted through the Former Worker Program[9]

Table 7. Number of Former Workers Screened and Re-screened by U.S. Department of Energy Site (through September 2015)

State	Sites	Initial Screenings	Re-screens
AK	Amchitka Island Test Site	1,418	629
CA	Lawrence Berkeley National Laboratory	440	169
CA	Lawrence Livermore National Laboratory	1,952	980
CA	Sandia National Laboratories, CA	169	71
CO	Rocky Flats Plant (Construction Workers)	812	374
CO	Rocky Flats Plant (Production Workers)	3,656	853
FL	Pinellas (Production Workers)	616	137
IA	Ames Laboratory	1,925	1,144
IA	Iowa Army Ammunition Plant	1,371	1,436
ID	Idaho National Laboratory (Construction Workers)	1,177	373
ID	Idaho National Laboratory (Production Workers)	4,858	3,204
IL	Argonne National Laboratory	626	63
IL	Fermi National Accelerator Laboratory	161	9
KY	Paducah GDP (Construction Workers)	984	443
KY	Paducah GDP (Production Workers)	3,455	2,243
MO	Kansas City Plant (Construction Workers)	725	255
MO	Kansas City Plant (Production Workers)	2,475	457
NM	Los Alamos National Laboratory	3,040	524

[9] The data for the FWP comes from six different projects and some former workers may have been seen by more than one program. Because of this, there is a need to periodically review and reconcile the data. Due to reconciling data in FY 2015, the numbers reported in this report differ from those in previous annual reports. Differences in data between FY 2014 and FY 2015 occurred for several reasons. For example, (1) site-specific data totals to date included all who were screened, including those screened through the National Supplemental Screening Program, (2) 3-year re-screens and 6-year re-screens were not separated, and (3) individuals could have more than one primary work site assigned to them, thus leading to some cases of double counting in FY 2014 data. These issues have now been reconciled.

State	Sites	Initial Screenings	Re-screens
NM	Sandia National Laboratories, NM	393	42
NV	Nevada National Security Site	4,895	2,431
NY	Brookhaven National Laboratory (Construction Workers)	607	294
NY	Brookhaven National Laboratory (Production Workers)	454	49
OH	Feed Materials Production Center (Construction Workers)	2,226	1,185
OH	Feed Materials Production Center (Production Workers)	1,305	727
OH	Mound Plant (Construction Workers)	396	156
OH	Mound Plant (Production Workers)	1,598	1,089
OH	Portsmouth GDP (Construction Workers)	1,157	567
OH	Portsmouth GDP (Production Workers)	3,711	2,818
SC	Savannah River Site (Construction Workers)	4,569	1,823
SC	Savannah River Site (Production Workers)	5,400	191
TN	Oak Ridge K-25 (K-25) (Production Workers)	4,732	3,536
TN	Oak Ridge National Laboratory (ORNL) (Production Workers)	2,147	1,376
TN	Oak Ridge Reservation[10] (Construction Workers)	3,418	1,522
TN	Y-12 National Security Complex (Y-12) (Production Workers)	3,813	2,460
TX	Pantex Plant	1,292	454
WA	Hanford Site (Construction Workers)	3,868	1,446
WA	Hanford Site (Production Workers)	5,196	761
	Other Sites[11] (Construction Workers)	1,463	454
	Other Sites[12] (Production Workers)	258	9
	Grand Total	82,758	36,754

[10] Includes K-25, ORNL, and Y-12

[11] Sites where the number of individuals screened by the Building Trades National Medical Screening Program to date is less than 100.

[12] Sites where the number of individuals screened by the National Supplemental Screening Program or the Worker Health Protection Program to date is less than 100.

Appendix C: Exam Results

More indepth information regarding the exam components offered through the program can be found on the Former Worker Program Web site (http://energy.gov/ehss/conventional-medical-screening-program). Medical findings by the U.S. Department of Energy (DOE) site/worker population are provided below.

Table 8 illustrates chest x-ray findings on initial exams to date, and Table 9 provides findings on re-screens.

Table 8. Chest X-ray Findings on Initial Screening (through September 2015)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust-related Disease	Lung Nodules, Nodes, or Lesions
AK	Amchitka Island Test Site	1,104	157 (14.2%)	1 (0.1%)	0 (0.0%)	60 (5.4%)
CA	Lawrence Berkeley National Laboratory	397	8 (2.0%)	0 (0.0%)	1 (0.3%)	23 (5.8%)
CA	Lawrence Livermore National Laboratory	1,772	34 (1.9%)	0 (0.0%)	4 (0.2%)	129 (7.3%)
CA	Sandia National Laboratories, CA	158	2 (1.3%)	0 (0.0%)	1 (0.6%)	12 (7.6%)
CO	Rocky Flats Plant (Construction Workers)	722	223 (30.9%)	7 (1.0%)	13 (1.8%)	27 (3.7%)
CO	Rocky Flats Plant (Production Workers)	3,233	746 (23.1%)	4 (0.1%)	56 (1.7%)	96 (3.0%)
FL	Pinellas (Production Workers)	597	50 (8.4%)	4 (0.7%)	15 (2.5%)	29 (4.9%)
IA	Ames Laboratory	1,855	67 (3.6%)	1 (0.1%)	62 (3.3%)	51 (2.7%)
IA	Iowa Army Ammunition Plant	1,270	123 (9.7%)	0 (0.0%)	67 (5.3%)	32 (2.5%)
ID	Idaho National Laboratory (Construction Workers)	951	110 (11.6%)	0 (0.0%)	2 (0.2%)	29 (3.0%)
ID	Idaho National Laboratory (Production Workers)	4,145	304 (7.3%)	1 (0.0%)	3 (0.1%)	122 (2.9%)
IL	Argonne National Laboratory	572	65 (11.4%)	0 (0.0%)	17 (3.0%)	18 (3.1%)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust-related Disease	Lung Nodules, Nodes, or Lesions
IL	Fermi National Accelerator Laboratory	153	14 (9.2%)	0 (0.0%)	5 (3.3%)	5 (3.3%)
KY	Paducah Gaseous Diffusion Plant (GDP) (Construction Workers)	904	151 (16.7%)	7 (0.8%)	12 (1.3%)	48 (5.3%)
KY	Paducah GDP (Production Workers)	3,374	214 (6.3%)	10 (0.3%)	17 (0.5%)	124 (3.7%)
MO	Kansas City Plant (Construction Workers)	634	91 (14.4%)	0 (0.0%)	1 (0.2%)	35 (5.5%)
MO	Kansas City Plant (Production Workers)	2,411	259 (10.7%)	1 (0.0%)	72 (3.0%)	96 (4.0%)
NM	Los Alamos National Laboratory	2,816	215 (7.6%)	0 (0.0%)	98 (3.5%)	52 (1.8%)
NM	Sandia National Laboratories, NM	371	25 (6.7%)	1 (0.3%)	16 (4.3%)	5 (1.3%)
NV	Nevada National Security Site	4,726	520 (11.0%)	38 (0.8%)	85 (1.8%)	384 (8.1%)
NY	Brookhaven National Laboratory (Construction Workers)	487	90 (18.5%)	0 (0.0%)	0 (0.0%)	9 (1.8%)
NY	Brookhaven National Laboratory (Production Workers)	326	16 (4.9%)	0 (0.0%)	0 (0.0%)	15 (4.6%)
OH	Feed Materials Production Center (Construction Workers)	1,965	221 (11.2%)	5 (0.3%)	0 (0.0%)	33 (1.7%)
OH	Feed Materials Production Center (Production Workers)	915	32 (3.5%)	0 (0.0%)	0 (0.0%)	39 (4.3%)
OH	Mound Plant (Construction Workers)	328	63 (19.2%)	0 (0.0%)	3 (0.9%)	6 (1.8%)
OH	Mound Plant (Production Workers)	1,393	63 (4.5%)	1 (0.1%)	0 (0.0%)	49 (3.5%)
OH	Portsmouth GDP (Construction Workers)	1,026	189 (18.4%)	3 (0.3%)	3 (0.3%)	40 (3.9%)
OH	Portsmouth GDP (Production Workers)	3,596	224 (6.2%)	5 (0.1%)	16 (0.4%)	103 (2.9%)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust-related Disease	Lung Nodules, Nodes, or Lesions
SC	Savannah River Site (Construction Workers)	4,039	412 (10.2%)	4 (0.1%)	1 (0.0%)	149 (3.7%)
SC	Savannah River Site (Production Workers)	3,723	961 (25.8%)	56 (1.5%)	383 (10.3%)	40 (1.1%)
TN	Oak Ridge K-25 (K-25) (Production Workers)	4,548	303 (6.7%)	5 (0.1%)	12 (0.3%)	95 (2.1%)
TN	Oak Ridge National Laboratory (ORNL) (Production Workers)	2,055	118 (5.7%)	1 (0.0%)	2 (0.1%)	72 (3.5%)
TN	Oak Ridge Reservation[13] (Construction Workers)	2,864	515 (18.0%)	6 (0.2%)	6 (0.2%)	114 (4.0%)
TN	Y-12 National Security Complex (Y-12) (Production Workers)	3,607	203 (5.6%)	6 (0.2%)	0 (0.0%)	147 (4.1%)
TX	Pantex Plant	1,267	63 (5.0%)	1 (0.1%)	8 (0.6%)	44 (3.5%)
WA	Hanford Site (Construction Workers)	3,186	818 (25.7%)	3 (0.1%)	2 (0.1%)	175 (5.5%)
WA	Hanford Site (Production Workers)	4,706	958 (20.4%)	2 (0.0%)	83 (1.8%)	237 (5.0%)
	Other Sites[14] (Construction Workers)	1,191	178 (14.9%)	5 (0.4%)	0 (0.0%)	27 (2.3%)
	Other Sites[15] (Production Workers)	229	18 (7.9%)	0 (0.0%)	17 (7.4%)	8 (3.5%)
	Grand Total	73,616	8,823 (12.0%)	178 (0.2%)	1,083 (1.5%)	2,779 (3.8%)

[13] Includes K-25, ORNL, and Y-12.
[14] Sites where the number of individuals screened by the Building Trades National Medical Screening Program (BTMed) to date is less than 100.
[15] Sites where the number of individuals screened by the National Supplemental Screening Program (NSSP) to date is less than 100.

Table 9. Chest X-ray Findings on Re-screening (through September 2015)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust -related Disease	Lung Nodules, Nodes, or Lesions
AK	Amchitka Island Test Site	411	29 (7.1%)	1 (0.2%)	0 (0.0%)	18 (4.4%)
CA	Lawrence Berkeley National Laboratory	96	1 (1.0%)	0 (0.0%)	0 (0.0%)	10 (10.4%)
CA	Lawrence Livermore National Laboratory	575	2 (0.3%)	0 (0.0%)	0 (0.0%)	55 (9.6%)
CA	Sandia National Laboratories, CA	41	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (14.6%)
CO	Rocky Flats Plant (Construction Workers)	266	13 (4.9%)	0 (0.0%)	2 (0.8%)	3 (1.1%)
CO	Rocky Flats Plant (Production Workers)	772	204 (26.4%)	4 (0.5%)	19 (2.5%)	17 (2.2%)
FL	Pinellas (Production Workers)	121	5 (4.1%)	0 (0.0%)	6 (5.0%)	1 (0.8%)
IA	Ames Laboratory	804	19 (2.4%)	0 (0.0%)	40 (5.0%)	14 (1.7%)
IA	Iowa Army Ammunition Plant	514	42 (8.2%)	0 (0.0%)	60 (11.7%)	16 (3.1%)
ID	Idaho National Laboratory (Construction Workers)	290	29 (10.0%)	0 (0.0%)	0 (0.0%)	6 (2.1%)
ID	Idaho National Laboratory (Production Workers)	1,747	81 (4.6%)	0 (0.0%)	5 (0.3%)	30 (1.7%)
IL	Argonne National Laboratory	53	1 (1.9%)	0 (0.0%)	3 (5.7%)	2 (3.8%)
IL	Fermi National Accelerator Laboratory	8	1 (12.5%)	0 (0.0%)	1 (12.5%)	0 (0.0%)
KY	Paducah GDP (Construction Workers)	331	36 (10.9%)	0 (0.0%)	1 (0.3%)	23 (6.9%)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust -related Disease	Lung Nodules, Nodes, or Lesions
KY	Paducah GDP (Production Workers)	1,527	42 (2.8%)	1 (0.1%)	0 (0.0%)	65 (4.3%)
MO	Kansas City Plant (Construction Workers)	196	18 (9.2%)	0 (0.0%)	0 (0.0%)	4 (2.0%)
MO	Kansas City Plant (Production Workers)	425	19 (4.5%)	0 (0.0%)	29 (6.8%)	9 (2.1%)
NM	Los Alamos National Laboratory	487	72 (14.8%)	0 (0.0%)	21 (4.3%)	2 (0.4%)
NM	Sandia National Laboratories, NM	43	8 (18.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
NV	Nevada National Security Site	1,433	98 (6.8%)	9 (0.6%)	52 (3.6%)	175 (12.2%)
NY	Brookhaven National Laboratory (Construction Workers)	214	12 (5.6%)	0 (0.0%)	0 (0.0%)	4 (1.9%)
NY	Brookhaven National Laboratory (Production Workers)	40	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
OH	Feed Materials Production Center (Construction Workers)	795	58 (7.3%)	0 (0.0%)	0 (0.0%)	5 (0.6%)
OH	Feed Materials Production Center (Production Workers)	448	7 (1.6%)	0 (0.0%)	1 (0.2%)	16 (3.6%)
OH	Mound Plant (Construction Workers)	116	14 (12.1%)	0 (0.0%)	1 (0.9%)	2 (1.7%)
OH	Mound Plant (Production Workers)	657	16 (2.4%)	0 (0.0%)	0 (0.0%)	22 (3.3%)
OH	Portsmouth GDP (Construction Workers)	418	60 (14.4%)	0 (0.0%)	0 (0.0%)	7 (1.7%)
OH	Portsmouth GDP (Production Workers)	1,678	106 (6.3%)	1 (0.1%)	1 (0.1%)	14 (0.8%)

State	Sites	Workers Screened	Asbestos-related Lung Disease	Silicosis	Other Dust -related Disease	Lung Nodules, Nodes, or Lesions
SC	Savannah River Site (Construction Workers)	1,255	117 (9.3%)	1 (0.1%)	0 (0.0%)	58 (4.6%)
SC	Savannah River Site (Production Workers)	186	8 (4.3%)	0 (0.0%)	16 (8.6%)	2 (1.1%)
TN	K-25 (Production Workers)	2,131	87 (4.1%)	1 (0.0%)	2 (0.1%)	76 (3.6%)
TN	ORNL (Production Workers)	939	32 (3.4%)	0 (0.0%)	4 (0.4%)	46 (4.9%)
TN	Oak Ridge Reservation[16] (Construction Workers)	1,110	130 (11.7%)	0 (0.0%)	0 (0.0%)	30 (2.7%)
TN	Y-12 (Production Workers)	1,662	74 (4.5%)	1 (0.1%)	2 (0.1%)	92 (5.5%)
TX	Pantex Plant	335	10 (3.0%)	0 (0.0%)	0 (0.0%)	12 (3.6%)
WA	Hanford Site (Construction Workers)	1,014	99 (9.8%)	0 (0.0%)	1 (0.1%)	47 (4.6%)
WA	Hanford Site (Production Workers)	638	76 (11.9%)	0 (0.0%)	20 (3.1%)	23 (3.6%)
	Other Sites[17] (Construction Workers)	377	16 (4.2%)	0 (0.0%)	0 (0.0%)	7 (1.9%)
	Other Sites[18] (Production Workers)	5	1 (20.0%)	1 (20.0%)	0 (0.0%)	0 (0.0%)
	Grand Total	24,158	1,643 (6.8%)	20 (0.1%)	287 (1.2%)	919 (3.8%)

[16] Includes K-25, ORNL, and Y-12.
[17] Sites where the number of individuals screened by BTMed to date is less than 100.
[18] Sites where the number of individuals screened by NSSP to date is less than 100.

Table 10 illustrates spirometry (breathing test) findings to date on initial exams, and Table 11 provides findings on re-screening.

Table 10. Spirometry Findings on Initial Screening (through September 2015)

State	Sites	Workers Screened	Obstructive Airways Dysfunction Detected
AK	Amchitka Island Test Site	1100	171 (15.5%)
CA	Lawrence Berkeley National Laboratory	404	43 (10.6%)
CA	Lawrence Livermore National Laboratory	1,776	211 (11.9%)
CA	Sandia National Laboratories, CA	157	13 (8.3%)
CO	Rocky Flats Plant (Construction Workers)	714	196 (27.5%)
CO	Rocky Flats Plant (Production Workers)	3,558	840 (23.6%)
FL	Pinellas (Production Workers)	591	167 (28.3%)
IA	Ames Laboratory	1,886	214 (11.3%)
IA	Iowa Army Ammunition Plant	1,296	258 (19.9%)
ID	Idaho National Laboratory (Construction Workers)	931	227 (24.4%)
ID	Idaho National Laboratory (Production Workers)	4,128	739 (17.9%)
IL	Argonne National Laboratory	584	61 (10.4%)
IL	Fermi National Accelerator Laboratory	151	11 (7.3%)
KY	Paducah GDP (Construction Workers)	889	227 (25.5%)
KY	Paducah GDP (Production Workers)	3,353	505 (15.1%)
MO	Kansas City Plant (Construction Workers)	621	145 (23.3%)
MO	Kansas City Plant (Production Workers)	2,388	548 (22.9%)
NM	Los Alamos National Laboratory	1,981	122 (6.2%)
NM	Sandia National Laboratories, NM	338	29 (8.6%)
NV	Nevada National Security Site	4,785	1,466 (30.6%)
NY	Brookhaven National Laboratory (Construction Workers)	510	66 (12.9%)

State	Sites	Workers Screened	Obstructive Airways Dysfunction Detected
NY	Brookhaven National Laboratory (Production Workers)	354	50 (14.1%)
OH	Feed Materials Production Center (Construction Workers)	1,919	376 (19.6%)
OH	Feed Materials Production Center (Production Workers)	904	108 (11.9%)
OH	Mound Plant (Construction Workers)	331	81 (24.5%)
OH	Mound Plant (Production Workers)	1,359	319 (23.5%)
OH	Portsmouth GDP (Construction Workers)	1,020	247 (24.2%)
OH	Portsmouth GDP (Production Workers)	3,587	755 (21.0%)
SC	Savannah River Site (Construction Workers)	4,007	698 (17.4%)
SC	Savannah River Site (Production Workers)	3,074	348 (11.3%)
TN	K-25 (Production Workers)	4,509	930 (20.6%)
TN	ORNL (Production Workers)	2,049	411 (20.1%)
TN	Oak Ridge Reservation[19] (Construction Workers)	2,836	531 (18.7%)
TN	Y-12 (Production Workers)	3,591	759 (21.1%)
TX	Pantex Plant	1,262	422 (33.4%)
WA	Hanford Site (Construction Workers)	3,180	790 (24.8%)
WA	Hanford Site (Production Workers)	5,043	938 (18.6%)
	Other Sites[20] (Construction Workers)	1,184	217 (18.3%)
	Other Sites[21] (Production Workers)	232	46 (19.8%)
	Grand Total	72,582	14,285 (19.7%)

[19] Includes K-25, ORNL, and Y-12.
[20] Sites where the number of individuals screened by BTMed to date is less than 100.
[21] Sites where the number of individuals screened by NSSP to date is less than 100.

Table 11. Spirometry Findings on Re-screening (through September 2015)

State	Sites	Workers Screened	Obstructive Airways Dysfunction Detected
AK	Amchitka Island Test Site	404	33 (8.2%)
CA	Lawrence Berkeley National Laboratory	103	8 (7.8%)
CA	Lawrence Livermore National Laboratory	592	32 (5.4%)
CA	Sandia National Laboratories, CA	44	1 (2.3%)
CO	Rocky Flats Plant (Construction Workers)	268	12 (4.5%)
CO	Rocky Flats Plant (Production Workers)	770	111 (14.4%)
FL	Pinellas (Production Workers)	123	25 (20.3%)
IA	Ames Laboratory	824	76 (9.2%)
IA	Iowa Army Ammunition Plant	473	166 (35.1%)
ID	Idaho National Laboratory (Construction Workers)	281	16 (5.7%)
ID	Idaho National Laboratory (Production Workers)	1,827	463 (25.3%)
IL	Argonne National Laboratory	54	1 (1.9%)
IL	Fermi National Accelerator Laboratory	8	1 (12.5%)
KY	Paducah GDP (Construction Workers)	326	18 (5.5%)
KY	Paducah GDP (Production Workers)	1,513	231 (15.3%)
MO	Kansas City Plant (Construction Workers)	188	5 (2.7%)
MO	Kansas City Plant (Production Workers)	414	46 (11.1%)
NM	Los Alamos National Laboratory	415	27 (6.5%)
NM	Sandia National Laboratories, NM	40	0 (0.0%)
NV	Nevada National Security Site	1,581	539 (34.1%)
NY	Brookhaven National Laboratory (Construction Workers)	224	3 (1.3%)
NY	Brookhaven National Laboratory (Production Workers)	48	6 (12.5%)
OH	Feed Materials Production Center (Construction Workers)	763	32 (4.2%)

State	Sites	Workers Screened	Obstructive Airways Dysfunction Detected
OH	Feed Materials Production Center (Production Workers)	457	42 (9.2%)
OH	Mound Plant (Construction Workers)	111	4 (3.6%)
OH	Mound Plant (Production Workers)	700	89 (12.7%)
OH	Portsmouth GDP (Construction Workers)	407	27 (6.6%)
OH	Portsmouth GDP (Production Workers)	1,676	393 (23.4%)
SC	Savannah River Site (Construction Workers)	1,227	59 (4.8%)
SC	Savannah River Site (Production Workers)	182	6 (3.3%)
TN	K-25 (Production Workers)	2,171	356 (16.4%)
TN	ORNL (Production Workers)	961	143 (14.9%)
TN	Oak Ridge Reservation[22] (Construction Workers)	1,088	96 (8.8%)
TN	Y-12 (Production Workers)	1,698	267 (15.7%)
TX	Pantex Plant	327	26 (8.0%)
WA	Hanford Site (Construction Workers)	987	77 (7.8%)
WA	Hanford Site (Production Workers)	629	120 (19.1%)
	Other Sites[23] (Construction Workers)	380	14 (3.7%)
	Other Sites[24] (Production Workers)	6	1 (16.7%)
	Grand Total	24,290	3,572 (14.7%)

[22] Includes K-25, ORNL, and Y-12.
[23] Sites where the number of individuals screened by BTMed to date is less than 100.
[24] Sites where the number of individuals screened by NSSP to date is less than 100.

Table 12 illustrates beryllium testing findings on initial exams to date, and Table 13 provides findings on re-screens.

Table 12. Results of Beryllium Lymphocyte Proliferation Tests (BeLPT) by DOE Site on Initial Screening (through September 2015)

State	Sites	Workers Screened	1 Abnormal	2 Abnormal	1 Abnormal and 1+ Borderline
AK	Amchitka Island Test Site	90	2 (2.2%)	0 (0.0%)	0 (0.0%)
CA	Lawrence Berkeley National Laboratory	168	2 (1.2%)	6 (3.6%)	0 (0.0%)
CA	Lawrence Livermore National Laboratory	1,199	9 (0.8%)	28 (2.3%)	6 (0.5%)
CA	Sandia National Laboratories, CA	108	2 (1.9%)	3 (2.8%)	1 (0.9%)
CO	Rocky Flats Plant (Construction Workers)	726	4 (0.6%)	4 (0.6%)	0 (0.0%)
CO	Rocky Flats Plant (Production Workers)	2,224	19 (0.9%)	13 (0.6%)	13 (0.6%)
FL	Pinellas (Production Workers)	588	7 (1.2%)	21 (3.6%)	3 (0.5%)
IA	Ames Laboratory	1,885	25 (1.3%)	22 (1.2%)	6 (0.3%)
IA	Iowa Army Ammunition Plant	1,363	19 (1.4%)	12 (0.9%)	8 (0.6%)
ID	Idaho National Laboratory (Construction Workers)	922	14 (1.5%)	5 (0.5%)	6 (0.7%)
ID	Idaho National Laboratory (Production Workers)	4,129	35 (0.8%)	25 (0.6%)	11 (0.3%)
IL	Argonne National Laboratory	299	5 (1.7%)	2 (0.7%)	1 (0.3%)
IL	Fermi National Accelerator Laboratory	104	2 (1.9%)	1 (1.0%)	0 (0.0%)
KY	Paducah GDP (Construction Workers)	903	15 (1.7%)	8 (0.9%)	1 (0.1%)
KY	Paducah GDP (Production Workers)	2,874	38 (1.3%)	17 (0.6%)	6 (0.2%)

State	Sites	Workers Screened	1 Abnormal	2 Abnormal	1 Abnormal and 1+ Borderline
MO	Kansas City Plant (Construction Workers)	624	2 (0.3%)	11 (1.8%)	3 (0.5%)
MO	Kansas City Plant (Production Workers)	2,342	36 (1.5%)	23 (1.0%)	10 (0.4%)
NM	Los Alamos National Laboratory	2,852	43 (1.5%)	35 (1.2%)	22 (0.8%)
NM	Sandia National Laboratories, NM	365	11 (3.0%)	3 (0.8%)	3 (0.8%)
NV	Nevada National Security Site	3,032	34 (1.1%)	25 (0.8%)	12 (0.4%)
NY	Brookhaven National Laboratory (Construction Workers)	496	5 (1.0%)	23 (4.6%)	0 (0.0%)
NY	Brookhaven National Laboratory (Production Workers)	356	4 (1.1%)	16 (4.5%)	5 (1.4%)
OH	Feed Materials Production Center (Construction Workers)	1,933	7 (0.4%)	13 (0.7%)	3 (0.2%)
OH	Feed Materials Production Center (Production Workers)	775	2 (0.3%)	2 (0.3%)	1 (0.1%)
OH	Mound Plant (Construction Workers)	329	0 (0.0%)	2 (0.6%)	0 (0.0%)
OH	Mound Plant (Production Workers)	1,384	19 (1.4%)	7 (0.5%)	3 (0.2%)
OH	Portsmouth GDP (Construction Workers)	1,020	15 (1.5%)	2 (0.2%)	1 (0.1%)
OH	Portsmouth GDP (Production Workers)	3,175	22 (0.7%)	10 (0.3%)	4 (0.1%)
SC	Savannah River Site (Construction Workers)	4,037	29 (0.7%)	37 (0.9%)	11 (0.3%)
SC	Savannah River Site (Production Workers)	2,663	60 (2.3%)	180 (6.8%)	6 (0.2%)
TN	K-25 (Production Workers)	4,543	93 (2.0%)	88 (1.9%)	23 (0.5%)
TN	ORNL (Production Workers)	2,033	21 (1.0%)	27 (1.3%)	9 (0.4%)

State	Sites	Workers Screened	1 Abnormal	2 Abnormal	1 Abnormal and 1+ Borderline
TN	Oak Ridge Reservation[25] (Construction Workers)	3,139	24 (0.8%)	22 (0.7%)	11 (0.4%)
TN	Y-12 (Production Workers)	3,605	52 (1.4%)	63 (1.7%)	11 (0.3%)
TX	Pantex Plant	1,247	10 (0.8%)	2 (0.2%)	0 (0.0%)
WA	Hanford Site (Construction Workers)	3,191	36 (1.1%)	31 (1.0%)	7 (0.2%)
WA	Hanford Site (Production Workers)	4,437	106 (2.4%)	32 (0.7%)	18 (0.4%)
	Other Sites[26] (Construction)	776	2 (0.3%)	3 (0.4%)	0 (0.0%)
	Other Sites[27] (Production)	164	2 (1.2%)	2 (1.2%)	0 (0.0%)
	Grand Total	66,100	833 (1.3%)	826 (1.2%)	225 (0.3%)

Table 13. Results of Beryllium Lymphocyte Proliferation Tests (BeLPT) by DOE Site on Re-screening (through September 2015)

State	Sites	Workers Screened	1 Abnormal[28]	2 Abnormal[29]	1 Abnormal and 1+ Borderline
AK	Amchitka Island Test Site	21	0 (0.0%)	0 (0.0%)	0 (0.0%)
CA	Lawrence Berkeley National Laboratory	27	0 (0.0%)	0 (0.0%)	0 (0.0%)

[25] Includes K-25, ORNL, and Y-12.
[26] Sites where the number of individuals screened by BTMed to date is less than 100.
[27] Sites where the number of individuals screened by NSSP to date is less than 100.
[28] May include individuals who did not receive a BeLPT at the time of their initial screening or who had a normal result on their initial screening and a single abnormal result on the re-screening.
[29] May include individuals who did not receive a BeLPT at the time of their initial screening, had a normal result on the initial screening, or had a single abnormal or borderline result on their initial screening that was confirmed on their re-screening.

State	Sites	Workers Screened	1 Abnormal[28]	2 Abnormal[29]	1 Abnormal and 1+ Borderline
CA	Lawrence Livermore National Laboratory	363	3 (0.8%)	2 (0.5%)	0 (0.0%)
CA	Sandia National Laboratories, CA	29	1 (3.4%)	0 (0.0%)	0 (0.0%)
CO	Rocky Flats Plant (Construction Workers)	206	1 (0.5%)	0 (0.0%)	0 (0.0%)
CO	Rocky Flats Plant (Production Workers)	508	3 (0.6%)	2 (0.4%)	1 (0.2%)
FL	Pinellas (Production Workers)	118	1 (0.8%)	0 (0.0%)	1 (0.8%)
IA	Ames Laboratory	818	4 (0.5%)	4 (0.5%)	1 (0.1%)
IA	Iowa Army Ammunition Plant	776	12 (1.5%)	4 (0.5%)	3 (0.4%)
ID	Idaho National Laboratory (Construction Workers)	222	2 (0.9%)	0 (0.0%)	0 (0.0%)
ID	Idaho National Laboratory (Production Workers)	1,558	7 (0.4 %)	15 (1.0%)	9 (0.6%)
IL	Argonne National Laboratory	41	1 (2.4%)	0 (0.0%)	0 (0.0%)
IL	Fermi National Accelerator Laboratory	8	0 (0.0%)	0 (0.0%)	0 (0.0%)
KY	Paducah GDP (Construction Workers)	276	0 (0.0%)	2 (0.7%)	0 (0.0%)
KY	Paducah GDP (Production Workers)	1,396	7 (0.5%)	6 (0.4%)	9 (0.6%)
MO	Kansas City Plant (Construction Workers)	189	5 (2.6%)	1 (0.5%)	0 (0.0%)
MO	Kansas City Plant (Production Workers)	414	0 (0.0%)	2 (0.5%)	1 (0.2%)
NM	Los Alamos National Laboratory	459	6 (1.3%)	1 (0.2%)	0 (0.0%)
NM	Sandia National Laboratories, NM	41	2 (4.9%)	0 (0.0%)	1 (2.4%)

State	Sites	Workers Screened	1 Abnormal[28]	2 Abnormal[29]	1 Abnormal and 1+ Borderline
NV	Nevada National Security Site	1,213	10 (0.8%)	9 (0.7%)	3 (0.2%)
NY	Brookhaven National Laboratory (Construction Workers)	207	6 (2.9%)	2 (1.0%)	1 (0.5%)
NY	Brookhaven National Laboratory (Production Workers)	40	0 (0.0%)	1 (2.5 %)	0 (0.0%)
OH	Feed Materials Production Center (Construction Workers)	564	4 (0.7%)	0 (0.0%)	0 (0.0%)
OH	Feed Materials Production Center (Production Workers)	370	1 (0.3%)	4 (1.1%)	2 (0.5%)
OH	Mound Plant (Construction Workers)	89	0 (0.0%)	0 (0.0%)	0 (0.0%)
OH	Mound Plant (Production Workers)	549	1 (0.2%)	10 (1.8%)	4 (0.7%)
OH	Portsmouth GDP (Construction Workers)	341	1 (0.3%)	0 (0.0%)	0 (0.0%)
OH	Portsmouth GDP (Production Workers)	1,581	7 (0.4%)	8 (0.5%)	5 (0.3%)
SC	Savannah River Site (Construction Workers)	1,031	12 (1.2%)	3 (0.3%)	2 (0.2%)
SC	Savannah River Site (Production Workers)	179	0 (0.0%)	1 (0.6%)	1 (0.6%)
TN	K-25 (Production Workers)	1,990	26 (1.3%)	28 (1.4%)	12 (0.6%)
TN	ORNL (Production Workers)	718	4 (0.6%)	21 (2.9%)	6 (0.8%)
TN	Oak Ridge Reservation[30] (Construction Workers)	1,065	8 (0.8%)	7 (0.7%)	3 (0.3%)
TN	Y-12 (Production Workers)	1,300	11 (0.8%)	32 (2.5%)	10 (0.8%)

[30] Includes K-25, ORNL, and Y-12.

State	Sites	Workers Screened	1 Abnormal[28]	2 Abnormal[29]	1 Abnormal and 1+ Borderline
TX	Pantex Plant[31]	200	2 (1.0%)	5 (2.5%)	0 (0.0%)
WA	Hanford Site (Construction Workers)	768	5 (0.7%)	3 (0.4%)	0 (0.0%)
WA	Hanford Site (Production Workers)	565	5 (0.9%)	0 (0.0%)	2 (0.4%)
	Other Sites[32] (Construction Workers)	177	2 (1.1%)	1 (0.6%)	1 (0.6%)
	Other Sites[33] (Production Workers)	5	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Grand Total	20,422	160 (0.8%)	174 (0.9%)	78 (0.4%)

Table 14 illustrates audiometry (hearing test) findings on initial exams to date.

Table 14. Audiometry Findings on Initial Screening (through September 2015)

State	Sites	Workers Screened	Noise Induced Hearing Loss (NIHL)
AK	Amchitka Island Test Site	1,119	742 (66.3%)
CA	Lawrence Berkeley National Laboratory	210	86 (41.0%)
CA	Lawrence Livermore National Laboratory	940	403 (42.9%)
CA	Sandia National Laboratories, CA	72	33 (45.8%)
CO	Rocky Flats Plant (Construction Workers)	692	455 (65.8%)
CO	Rocky Flats Plant (Production Workers)	3,500	2,096 (59.9%)
FL	Pinellas (Production Workers)	588	229 (38.9%)

[31] The site-specific project does not offer audiograms. However, workers referred to the NSSP are provided audiograms.
[32] Sites where the number of individuals screened by BTMed to date is less than 100.
[33] Sites where the number of individuals screened by NSSP to date is less than 100.

State	Sites	Workers Screened	Noise Induced Hearing Loss (NIHL)
IA	Ames Laboratory[34]	186	53 (28.5%)
IA	Iowa Army Ammunition Plant[35]	105	86 (81.9%)
ID	Idaho National Laboratory (Construction Workers)	890	584 (65.6%)
ID	Idaho National Laboratory (Production Workers)	3,928	2,259 (57.5%)
IL	Argonne National Laboratory	599	218 (36.4%)
IL	Fermi National Accelerator Laboratory	159	62 (39.0%)
KY	Paducah GDP (Construction Workers)	843	644 (76.4%)
KY	Paducah GDP (Production Workers)	3,309	1,858 (56.1%)
MO	Kansas City Plant (Construction Workers)	598	346 (57.9%)
MO	Kansas City Plant (Production Workers)	2,371	1,115 (47.0%)
NM	Los Alamos National Laboratory	2,590	1,528 (59.0%)
NM	Sandia National Laboratories, NM	321	182 (56.7%)
NV	Nevada National Security Site	4,227	3,219 (76.2%)
NY	Brookhaven National Laboratory (Construction Workers)	517	337 (65.2%)
NY	Brookhaven National Laboratory (Production Workers)	352	216 (61.4%)
OH	Feed Materials Production Center (Construction Workers)	1,914	967 (50.5%)
OH	Feed Materials Production Center (Production Workers)	912	330 (36.2%)
OH	Mound Plant (Construction Workers)	318	206 (64.8%)

[34] The site-specific project does not offer audiograms. However, workers referred to the NSSP are provided audiograms.
[35] The site-specific project does not offer audiograms. However, workers referred to the NSSP are provided audiograms.

State	Sites	Workers Screened	Noise Induced Hearing Loss (NIHL)
OH	Mound Plant (Production Workers)	1,357	713 (52.5%)
OH	Portsmouth GDP (Construction Workers)	1,053	759 (72.1%)
OH	Portsmouth GDP (Production Workers)	3,512	1,814 (51.7%)
SC	Savannah River Site (Construction Workers)	4,125	2,433 (59.0%)
SC	Savannah River Site (Production Workers)	3,093	1,849 (59.8%)
TN	K-25 (Production Workers)	4,167	2,686 (64.5%)
TN	ORNL (Production Workers)	2,041	1,212 (59.4%)
TN	Oak Ridge Reservation[36] (Construction Workers)	2,786	1,985 (71.2%)
TN	Y-12 (Production Workers)	3,586	2,320 (64.7%)
TX	Pantex Plant[37]	79	30 (38.0%)
WA	Hanford Site (Construction Workers)	2,474	1,720 (69.5%)
WA	Hanford Site (Production Workers)	4,167	2,059 (49.4%)
	Other Sites[38] (Construction Workers)	958	599 (62.5%)
	Other Sites[39] (Production Workers)	228	111(48.7%)
	Grand Total	64,886	38,544 (59.4%)

[36] Includes K-25, ORNL, and Y-12.
[37] The site-specific project does not offer audiograms. However, workers referred to the NSSP are provided audiograms.
[38] Sites where the number of individuals screened by BTMed to date is less than 100.
[39] Sites where the number of individuals screened by NSSP to date is less than 100.

Appendix D: Resources

U.S. Department of Energy (DOE) Former Worker Medical Screening Program (FWP) Web site
http://energy.gov/ehss/services/worker-health-and-safety/former-worker-medical-screening-program

FWP Medical Protocol
http://energy.gov/ehss/downloads/former-worker-program-medical-protocol

FWP Summary of Services
http://energy.gov/ehss/downloads/former-worker-program-summary-services

A Basic Overview of the FWP (Brochure)
http://energy.gov/ehss/downloads/former-worker-medical-screening-program-brochure

DOE Chronic Beryllium Disease Awareness Web site
https://ehss.energy.gov/HealthSafety/fwsp/advocacy/cbd/

Building Trades National Medical Screening Program
http://www.btmed.org/default.cfm
1-800-866-9663

FWP for Burlington Atomic Energy Commission Plant (otherwise known as the Iowa Army Ammunition Plant) and Ames Laboratory
http://www.iowafwp.org
1-866-282-5818

Medical Exam Program for Los Alamos National Laboratory Former Workers
http://www.jhsph.edu/LANLFW/index.html
1-877-500-8615

National Supplemental Screening Program
http://www.orau.org/nssp/
1-866-812-6703

Pantex FWP
1-888-378-8939

Worker Health Protection Program
http://www.worker-health.org/
1-888-241-1199
1-877-771-7977 (for former Nevada National Security Site workers)

Medical Facilities with Experience Evaluating Chronic Beryllium Disease
http://energy.gov/ehss/downloads/former-workers-medical-facilities-experience-evaluating-chronic-beryllium-disease

DOE Human Subjects Protection Program
http://science.energy.gov/ber/human-subjects/

A Basic Overview of the Energy Employees Occupational Illness Compensation Program (EEOICP) (Brochure)
http://energy.gov/ehss/downloads/basic-overview-energy-employees-occupational-illness-compensation-program

U.S. Department of Labor (DOL) Division of Energy Employees Occupational Illness Compensation
http://www.dol.gov/owcp/energy/index.htm

DOL Resource Centers
http://www.dol.gov/owcp/energy/regs/compliance/ResourceMeetings/ResourceCenters.htm

National Institute for Occupational Safety and Health (NIOSH) Dose Reconstruction
http://www.cdc.gov/niosh/ocas/ocasdose.html

DOL Office of the Ombudsman for the EEOICP
http://www.dol.gov/eeombd/