

**MEETING MINUTES, DUPONT CHAMBERS WORKS FUSRAP SITE
RESTORATION ADVISORY BOARD**

To: Interested Parties
From: Gary Rohn, U.S. Army Corps of Engineers, Philadelphia District
Re: Minutes of May 8, 2000 RAB Meeting
Draft: June 9, 2000

RAB Members Present:	Affiliation
Janet Agnew	Community
Robert Bender	Community
George Bock	Army Corps of Engineers
Sandra Chaloux	CEC, Inc.
Frank Faranca	NJ DEP
Douglas Fogg	Community
James Kates	Carneys Point Rep
Charles Kohler	Community
Paul Morris	Penns Grove
Steve Rogers	DuPont Chambers Works Rep.
Glenn W. Braswell	Salem County Rep.
Francis Faunt	Community
John Clemente, Jr.	Community
Catherine Dare	Community
H. Glen Donelson	Community
 RAB Members Absent:	
Armando Fernandez	Community
Jim Gant	Community
Ron Giordano	Community
Andrew Park	EPA, Region II
George Reed	Pennsville Rep.
Gary Rohn	Army Corps of Engineers

7:10 PM Welcome and Introductions (*Sandra Chaloux, CEC, Inc.*)
 Sandra welcomed the meeting participants to the second RAB meeting of the DuPont Chambers Works FUSRAP Site. Meeting attendees introduced themselves. Sandra reviewed the meeting agenda and stated that the main goal of the meeting was to provide the RAB background information on radiation issues and to get through some of the organizational issues such as electing the community co-chair and alternate co-chair, as well as further develop a set of operating rules. The group reviewed the meeting summary from the last meeting. No corrections were noted.

7:15 PM Army Corps / FUSRAP Update (*Gary Rohn, USACE Program Manager*)

Gary provided an update on some of the requests from the previous meeting. One of the requests was an in-depth list of documents in the administrative record. An index of the documents in the information repository was mailed to the RAB with the minutes from the previous meeting and is available in the Salem Community College Library.

Another question had been raised about the results of DOE's hazard assessments for Building 845. Gary disseminated the Results and Conclusion pages from DOE's May 1997 Hazard Assessments report for Building 845 to the RAB. He informed the RAB that the entire report is available for review in the Administrative Record at Salem Community College Library. Gary summarized the findings from the Results and Conclusions page. DOE's report concludes that the calculation performed for this assessment indicates that residual contamination in Building 845 is substantially below DOE's guidelines for protection. The report indicated a maximum of nine-milligram of exposure for employees which is well below the DOE guideline of 100 milligrams per year. The concluding sentence in the DoE report is ...*"The residual of radioactive material remaining in the building does not pose a potential threat of future exposure."*

Since the last meeting in March, the Corps has awarded a contract to an Architect-Engineer firm to do historical research on the site. This has been an extensive effort to locate all the material they can find on FUSRAP activities at this site. Over the next 2 months the contractor will also be researching maps for the site. The Corps is preparing a GIS site map using aerial photography and survey information. Gary stressed that the Corps is trying to construct a very controlled Geographic Information System for the site.

In terms of project funding, Gary said that even though the federal government's entire budget is under a great deal of scrutiny, the FUSRAP program is holding its own in the federal budget. The budget request for the entire FUSRAP program was \$140,000,000 for FY01. Gary told the RAB that they will have the funding in the next fiscal year to carry forward the schedule of activities that is presented by George.

FUSRAP Scheduling Overview (George Bock, USACE Project Manager)

George provided an overview of the project activities from the past few months including: the site history investigation, a series of technical meetings, collection of existing mapping, and initiation of the GIS database for the site. Regarding the site history investigation, he noted that it has been a very extensive voluminous process. The Corps has found over 400 inches worth of documentation on the site, some dating back to the 1920's until the present time.

George provided the work schedule for the site. The Corps will be following EPA's Comprehensive Environmental Responsibility and Compensation Liability Act (CERCLA) requirements for the cleanup effort. The Remedial Investigation/ Feasibility Study (RI/FS) phase has already begun, and the Corps is currently developing a project plan. The project plan will be completed by November 2000. He proposed the next RAB meeting be held in October or November to present what has been accomplished, what the future plans look like, and the data that has been collected. From there, the Corps will come up with a Field Plan, which will take several months to complete. He proposed a RAB meeting in February or March of 2001 to review the Field Plan. George plans to have the GIS mapping ready for the RAB members at the Feb/March RAB meeting. He noted that the field work and analysis will be performed from March to July 2001 including on-site well water testing and soil samples. George proposes another RAB meeting in June/July 2001 to review the findings of the field effort. The RI/FS report will be completed by November 2001.

The next stage in the project will be the Proposed Plan. The Proposed Plan will determine what remediation, if any, is needed, and the clean-up levels. The Corps plans to have a RAB meeting in February/March 2002 to review the Proposed Plan and in September/October 2002 during the development of the Record of Decision (ROD - The ROD is formal documentation describing the selected cleanup alternative). There will be a 60 day public comment period for the Record of Decision. The next phase will be the Remedial Design/Remedial Action (RD/RA). It will involve the engineering design and construction of the cleanup action. The RD/RA will be conducted from September 2002 to December 2004. The final stage of the project is the Operations & Maintenance (O&M) phase. This generally involves monitoring of the cleanup effort installed. O & M will be completed by December 2006.

Radiation Instruction 101 (*Hans Honerlah, USACE Baltimore District*)

Hans gave a very complete overview of the history of the Manhattan Engineering District, the history of uranium and radiation, the history of FUSRAP, and then some of the basic principles of radiation protection, as well as information on some natural sources of radiation for comparison with the levels at the site.

The Manhattan Engineering District (MED) was a code name for the U.S. efforts in WWII to develop the atom bomb. The FUSRAP program involves 46 sites in 14 states. Hans showed a map where the sites are located. A lot of the early MED research took place in the Northeast. The FUSRAP program was established as a funding program, to address environmental issues at MED research sites.

Waste storage and disposal took place at numerous MED sites. These sites are currently undergoing cleanup, mainly in the St. Louis and New York area. There were other sites that were added into the program that did some early work for the AEC, or Atomic Energy Commission. Two of the FUSRAP sites are located in northern New Jersey and in Baltimore.

Uranium was discovered in 1878 by a German chemist. For over 100 years, uranium was used as a coloring agent for ceramic glazes and for tinting in early photography.

Radium was discovered in 1898 by Madam Curie. Radium was used in early cancer studies research. Nuclear fission was discovered in 1939. The first chain reaction was achieved in Chicago. The first Nuclear explosion occurred in 1945. Nuclear power began in 1951 and now generates 17% of the world's electricity.

Uranium can be found in some of the natural materials used every day such as fossil fuels and building materials such as concrete and cinder blocks. Uranium was brought in from Africa where some of the highest concentrated materials could be found. It was stored at a facility in Middlesex NJ until the Manhattan Engineer District determined which facilities would process it. Research was done at the DuPont facility.

There are three chains of radionuclides: the uranium series, the actinium series, and the thorium series. Each are natural in the environment. When you pull them out of the environment, they are in equilibrium with many daughters (associated elements). At the Dupont site, we are mostly concerned with the uranium series (Uranium 238 decay chain - Thorium 234, Thorium 230, and Radium 226).

Most of the MED activities at the DuPont site ended in 1946 with deletion of the facility from the MED program in 1947. DuPont processed Uranium in several different forms for research and development. The uranium levels at DuPont do not pose any risk to employees above levels that they would encounter naturally in the environment. He reviewed some of the common terms used. Activity is the number of nuclear disintegrations per unit time. It determines the level of radioactivity. It is measured in curies. The formula is 3.7×10^{10} disintegrations per second. Hans told the RAB that size doesn't indicate the level of radioactivity present. For example, 1 curie of Cesium is .016 grams and 1 curie of Radium 226 is 1 gram. In reports, you will see "x" curies per gram for soil and "x" curies per liter for water. REM - refers to the level of exposure. The formula used is Radiation Absorbed Dose times a quality factor (based on type of radiation - Alpha, Beta, Gamma). These elements allow you to calculate doses to the individual. In the soil, we are dealing with picocuries - this is infinitely smaller than the curie - the equivalent of having a decimal point and twelve zeros in front. The soil at DuPont is

probably in the 1 picocurie level. A nanocurie is a decimal point with nine zeros in front. Consumer products such as smoke detectors use radioactive materials in the nanocurie amounts.

Occupational and public doses will be maintained As Low As Reasonably Achievable (ALARA - a commonly used principle used in radiation protection). The dose limits for occupational exposure based on federal guidance is 5,000 mrem/year. The Corps' ALARA practices are much more conservative with an effort to keep exposure levels lower than 100 mrem/year.

Types of Ionizing Radiation - Beta particles, Alpha particles, Neutron, and Photons. Beta particles - travel a few centimeters to several meters and can be shielded by plastic. They can pose an external exposure. Alpha particles travel very few centimeters in air. They cannot penetrate a piece of paper or skin. They are heavier molecules and are not a hazard to the body unless they are inside the body. Neutrons - few occur in natural materials. They are common in nuclear power plant settings and can be shielded by water. We don't have anything at DuPont generating Neutrons. Radiation can be generated from electric waves, radio waves, microwaves, and infrared technologies and with increased frequency from Xrays and gamma rays. Alpha & Beta particles are the primary concerns at the DuPont Site. We don't have gamma or Xrays that would cause external exposure. The Uranium has a decay process that mainly involves Alpha particles. We are most concerned about ingestion of the material - of it getting into the body. The route of entry could be inhalation, ingestion, absorption, or injection. Absorption isn't a concern here because of its chemical form. If it was in a gaseous state it may be able to be absorbed through the body.

Internal Radiation Protection - will be major issue on site. Inhalation can result from a radionuclide being airborne or from breathing dust. Dust control measures are the main way to handle this such as spraying down areas being sampled. Ingestion can result from poor housekeeping, poor decontamination or bad work practices. The Corps' work plan that will address site safety will be 3-6 inches thick for all people working at the site. Injection could be caused by slips, trips, and falls. Gamma particles can be shielded by soil or metal.

External Radiation Protection measures involve minimizing time around these materials, keeping your distance, and shielding the particles.

There are a number of sources of radiation from terrestrial, cosmic, natural, and manmade. An example of a natural source is Potassium 40. The average person receives about 39 mrem/year in the forms of Bananas or salt. Radon is primarily released from U238 and can be found in granite. Many of the old buildings in DC have high levels of Radon. Manmade sources of radiation include: medical uses, X-ray machines, nuclear medicine; consumer products such as TV's, cell phones, smoke detectors, and cigarettes. Industrial uses - oil industry uses well logging to tell different densities of soil, and power.

A typical person in U.S. receives 360 mrem/year of radiation with about 55% coming from radon, 11% from things you eat, 8% from terrestrial, 8% from cosmic, 3% from consumer products, 1% from medical (assumption is 1 X-ray per year), and the rest from other sources including nuclear power (less than 1%).

EPA's cleanup levels are 15-25 mrem/year based on 1 in 1,000,000 chances of getting cancer. This equates to risks associated with 40 tablespoons of peanut butter, 100 charbroiled steaks, and 1.5 cigarettes (equaling 10 mrem/year). NRC dose limits for occupational exposures are 5000 mrem/year for the whole body. The Corps standards are 100 mrem/year, 50 mrem/year for air and water, 25 mrem for decommissioning (which is what we are doing at the DuPont site), and 4 mrem/year for gamma and beta isotopes.

Organizational Issues (Sandra Chaloux & RAB members) The RAB elected Francis Faunt as the Community Co-Chair and Katherine Dare as the Alternate Co-Chair. The RAB reviewed the draft operating rules and mission statement. Sandra will work with the community co-chair to create a revised draft to send out to the board before the next meeting. Goal is to have the operating rules ready for signature at the next meeting.

8:40 PM Establish Action Items/Set Agenda (RAB)
The next RAB Meeting was set for Monday, November 13, 2000 at 7:00 p.m. at the Hampton Inn in Pennsville.

Agenda items identified for the next RAB meeting include:

- Corps Update
- Project Plan
- Website

9:00 PM Meeting Adjourned

Guests Present:	Affiliation:
Al Boettler	DuPont
Karl W. Ford	USACE - Baltimore
Hans Honerlah	USACE - Baltimore