

**Restoration Advisory Board (RAB) Meeting Summary
DuPont Chambers Works FUSRAP Site
Hampton Inn, Pennsville, New Jersey
October 15, 2009**

To: Interested Parties
From: George Bock, Project Manager, U.S. Army Corps of Engineers, Philadelphia District
Re: Meeting Summary, October 15, 2009 RAB Meeting

RAB Members Present	Affiliation
George Bock, Government Co-Chair	U.S. Army Corps of Engineers
Al Boettler	DuPont
Frank Faranca	New Jersey Dept. of Environmental Protection
Paul Morris	Borough of Penns Grove
James Warner, Community Co-Chair	Salem County Representative, Dept. of Health
RAB Members Absent	
Janet Agnew	Community
Glen Donelson, Community Co-Chair	Pennsville School District
Francis Faunt	Community
Mack Lake	Carney Point Township
Charles Morris	Community
Sin-Kie Tjho	U.S. EPA, Region II
Gary Ricketts	DuPont Chambers Works
Mel Beals	Pennsville Township Representative
John Prigger	Community
Facilitator Present	
Ann Johnson	Cabrera Services
Guests Present	
Ed McKenzie	Carneys Point resident
Anne Pavelka	New Jersey Dept. of Environmental Protection
Scott Northey	DuPont Chambers Works
Samuel Osborn	Carneys Point resident
Anne Peregmon	Pennsville resident
Ed Lutz	DuPont
Nicki Fatherly	U.S. Army Corps of Engineers - Baltimore
Mahmud Rahman	Cabrera Services
Carl Young	Cabrera Services

Welcome (George Bock, Project Manager)

The meeting started at 7:20 p.m. George welcomed everyone and requested that participants introduce themselves. He reviewed the agenda and then provided an overview of the Manhattan Engineer District (MED) activities, the Formerly Utilized Sites Remedial Action Program (FUSRAP), and the Chambers Works project.

MED Program – Background: During World War II, MED was created by the Army to carry out much of the nation’s early atomic energy work, referred to as the "Manhattan Project". In the 1940s, 1950s, and 1960s work was done at a number of sites across the country in support of this program. After the war the Atomic Energy Commission (AEC) was formed in 1946 to continue MED efforts and seek ways to use nuclear energy for peaceful purposes. AEC conducted radiological surveys and cleanup activities at sites that were used during the MED program. These sites were evaluated for residual radiological

contamination and were cleaned up during the late 1940s and early 1950s based on the science and cleanup standards of the time. In March 1974, AEC established FUSRAP to address residual radiological contamination at some of these sites. The Department of Energy (DOE) was created in 1977 and assumed responsibility of FUSRAP. In late 1997, Congress transferred the program to the Army Corps of Engineers (USACE) for implementation of all cleanup activities.

MED History at Chambers Works: Operations involving uranium processing began at Chambers Works in 1942. The federal government contracted with DuPont to convert uranium oxide to uranium tetrafluoride and small quantities of uranium metal. A number of processes were used to convert the uranium oxide (brown oxide, recovery, green salt, metal, and hexafluoride processes) but no enrichment or depletion of uranium took place at the DuPont Chamber Works site. In 1948 and 1949 the Atomic Energy Commission (AEC) surveyed the site and decontaminated building surfaces based on the standards of the time. All buildings and areas were released back to DuPont for the company's use.

FUSRAP Background: During the 1970s and 1980s DOE went back and started preliminary investigations under FUSRAP to further evaluate and clean up areas on the DuPont property. However, a nationwide lawsuit at the time limited that work. When transferred to the USACE in 1997 all cleanup investigations were planned and conducted according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidelines (Superfund law). George explained the steps in the CERCLA cleanup process indicating that the project is now moving beyond the investigation phase and towards remedial decisions. The remedial investigation and baseline risk assessment documents were submitted to the regulatory agencies and DuPont for review in early June 2009. Although USACE is the lead federal agency for site cleanup, NJDEP and EPA Region 2 review and comment on plans and remedial action documents.

Site History: George showed the FUSRAP site map, described the areas being investigated by the USACE for residual radiological contamination from MED operations, and summarized activities completed to date. He pointed out the six areas of concern (AOCs) that were grouped into the following three OUs to facilitate the USACE's phased investigation:

- OU 1: AOC 1 (Building 845 Area) and AOC 2 (F-Corral)
- OU 2: AOC 3 (Central Drainage Ditch) and AOC 5 (Building J-26 Area)
- OU 3: AOC 4 (Historical Lagoon A) and AOC 6 (East Area)

Project Accomplishments: George then reviewed completed project activities for the benefit of any new guests.

- removed personal protection equipment (PPE) and drums of decontamination waste at Building 845 (1998)
- completed an emergency removal action after DuPont demolished Building 845. USACE removed structural steel, embedded with uranium, and transported to an offsite, permitted disposal facility (1999)
- held first community and public meetings (2000)
- completed the first sampling effort at OU 1, Building 845 and the F Corral (2001 and 2002)
- completed the sampling effort at OU 2, Building J-26 and the Central Drainage Ditch (CDD) and managed the proper disposal of all investigation-derived waste (2003)
- completed cone penetrometer testing (CPT) in OU 3, Historical Lagoon and East Area, and groundwater well installation at OU 1 and OU 2 (2004)
- completed groundwater well installation throughout the site and field investigations at OU 3 (2005 and 2006)
- continued groundwater monitoring sampling events and collected additional samples (soil and groundwater) in support of baseline risk assessment (2007)
- completed report (RI and BRA) preparation, internal USACE review, and regulatory agency review (2008 and 2009)

- prepared draft FS report and completed internal USACE review (2009)

George then discussed significant activities that have occurred since the last meeting (May through September 2009): USACE technical team planning meeting (May); submittal of preliminary draft FS and response to comments (May); Stakeholders Meeting with NJDEP, EPA, and DuPont technical teams (July); and submittal of revised FS to USACE (September).

George described the groundwater investigation within the FUSRAP areas. Groundwater was investigated as a direct result of concerns raised by RAB and community members. USACE installed and monitored 40 wells and also sampled a limited number of existing DuPont wells. Monitoring data has provided a great deal of information about the geochemical conditions in these areas and an understanding of the uranium plumes and their limited movement over the last 65 years. There are areas of extremely high uranium in the OU 1 source zones but within a very short distance, still within the AOC boundaries, concentrations drop off dramatically and are below the state and federal drinking water standards. Due to reducing conditions at Chambers Works the aqueous uranium in groundwater has not migrated significantly since MED operations. The last several years of monitoring has shown no advancement of the impacted groundwater. It was emphasized that once the soil contamination is managed or removed, it is expected that groundwater contamination will be greatly reduced or eliminated.

Question: Where are the wells located that were sampled during the groundwater investigation? The wells are located within the AOCs where uranium was encountered in soil. The groundwater investigation started within the source zones and then moved downgradient and upgradient from these locations. The size of the plume in the FUSRAP areas is very small so there was no need to investigate groundwater past the DuPont property line.

Status of Feasibility Study: Carl Young summarized the progress on the draft Feasibility Study (FS) report. A draft report was submitted to the USACE technical reviewers at the end of September 2009. Carl presented the current technical recommendations as presented in the draft report and emphasized that changes may occur as a result of the ongoing USACE review and comment period.

FS is prepared after the completion of the Remedial Investigation (RI) and Baseline Risk Assessment (BRA) reports, utilizing data and results of those reports. It identifies and evaluates various remedial alternatives to address areas with unacceptable risks to human health and/or the environment resulting from soil or groundwater contamination. After comparison of alternatives the USACE selects a preferred remedial alternative and presents it to the community for review in a document referred to as the proposed plan (PP). After public comments are received and addressed, USACE will begin cleanup activities. The selected remedial action is documented in Record of Decision (ROD).

Under FUSRAP, the USACE is authorized to cleanup radioactive contamination remaining from MED activities or chemicals used directly in the processing of the radioactive material. By investigating past operations and materials used at Chambers Works, USACE identified the following eligible radionuclides for cleanup under FUSRAP: isotopes of natural uranium (U-234, U-235, and U-238), and two decay daughters, Ra-226 and Th-230. No chemical constituents (hazardous substances) associated with MED processing activities were identified for the Site. Therefore, chemical constituents in soil and groundwater are not eligible for FUSRAP remediation at the Chambers Works site. These constituents will be addressed only where mixed or MED radioactive contamination.

Risk assessment results exceeded acceptable criteria in two areas for radiological contaminants. In OU 1 unacceptable risks were identified for construction and utility workers whereas in AOC 6 unacceptable risks were identified for industrial and construction workers. These areas were further evaluated in the FS. In the draft FS the proposed remediation goal that is being recommended to the USACE is 65 pCi/g total uranium. This means that within OU 1 and AOC 6 soil with concentrations exceeding this level will be cleaned up.

The site is zoned for industrial land use and is expected to remain that way into the future. USACE wants to ensure that the FUSRAP areas are cleaned up and safe for industrial workers well into the future. No residential use of the property is expected. As evaluated in the baseline risk assessment current and future receptor scenarios include the following workers at the site: industrial worker; construction worker; utility worker; and maintenance worker. Typical exposure durations are different for each worker scenario. The construction worker was determined to be the most potentially exposed worker at the site. Using this receptor scenario the proposed cleanup goal of 65 pCi/g total uranium satisfies NJ's 15 millirem/year dose criteria.

A number of cleanup actions are considered in the FS. A "No Action" alternative is always evaluated as a baseline condition so other proposed cleanup options can be compared to it. Other options may include land use controls (site restrictions); monitoring of the site; containment (capping) of contamination; removal and treatment of contaminants; and various disposal options. The following five remedial alternatives for contaminated soil were evaluated in the FS for Chambers Works:

S1 – No Action

S2 – Land Use Controls and Site Maintenance

S3 - Capping

S4 – Excavation followed by Offsite Disposal

S5 – Excavation followed by Treatment and Offsite Disposal

After comparison of these alternatives in the FS, the USACE will decide which alternative(s) meets CERCLA criteria and is most appropriate for the Site. At this time, Cabrera is recommending to the USACE reviewers that soils with concentrations of uranium above the 65 pCi/g be excavated and sent offsite to a safe and permitted facility for disposal (Alternative S4).

Carl showed a cross section through the areas in relation to a 6-foot tall person to illustrate the depth of excavation through the area. In OU 1 soils will be excavated to a maximum depth of 8 feet in AOC 1 and to 15 feet in AOC 2. In AOC 6 (OU 3) the affected area is limited in size with soils excavated to a maximum depth of 8 feet (under the roadway) and a shallower area excavated to approximately 4 feet.

By excavating contaminated soil above 65 pCi/g (total uranium), USACE will also be removing the center of the groundwater contamination. As a result, only low concentrations of uranium will remain around the edges of the excavated areas. To address this contaminated groundwater the following groundwater alternatives were identified and evaluated in the draft FS:

GW1 – No Action

GW2 – Land Use Controls and Site Maintenance

GW3 – Ex situ Groundwater Treatment

GW4 – Monitored Natural Attenuation

Carl showed the limited areas of contaminated groundwater and described each of the alternatives evaluated. After comparison and evaluation, it appears that monitored natural attenuation may be the best option to address the limited contamination in groundwater remaining after excavation (Alternative GW4). However, it is important to note that no decision has been made and USACE is still reviewing all options.

Question: What's the federal standard for uranium in groundwater?

NJDEP's Groundwater Quality standard and the federal Safe Drinking Water Act standard, Maximum Contaminant Level (MCL) are both the same for uranium (30 micrograms per liter) based on kidney toxicity.

Question: Are institutional controls being proposed for the areas outside the excavated zone and for the other FUSRAP AOCs that are not evaluated in the FS?

At this time the FS is a draft document and reviewers may have comments regarding the proposed institutional controls. Areas outside the excavated zone will have institutional controls as part of the remedial alternative since contaminants will remain onsite above levels that are acceptable for residential use. It is expected that institutional controls will be proposed on a sitewide basis for all FUSRAP areas.

Question: Does the 65 pCi/g meet the “all controls fail” residential scenario that was discussed at the Stakeholders Meeting in July?

Cleanup to the remediation goal, as proposed, would satisfy the “all controls fail” scenario as specified in NJ regulations.

Community Involvement: Ann Johnson then discussed the RAB’s 10th anniversary, thanking RAB members for their dedicated support. The RAB has worked with George and the USACE team since the beginning of the project, holding regular meetings at a frequency consistent with project activities. Glen Donelson and James Warner were especially thanked for their service as community co-chairs over the last ten years. The RAB has been central to the community involvement program at Chambers Works and meetings, like tonight, have been vital in maintaining an effective dialogue between community members and government decision makers.

Ann then reviewed past and current community issues and concerns and upcoming activities. In 2006, issues included environmental issues, access to project information, area development concerns, and FUSRAP project schedule. More recently during 2008 and 2009, the community concerns and questions have focused on type of contamination present, groundwater and proximity to municipal wells, DuPont pumping wells and any effects on the FUSRAP wells, and the details of how USACE will cleanup the site.

The group then discussed ongoing community involvement activities. The USACE will issue a newsletter in early 2010 (winter edition) to present an overview of the RI and risk assessment results. The USACE will continue to expand and evaluate the FUSRAP mailing list to get prepared for upcoming public comment periods.

George then shared that he will be moving to Germany in early 2010 to accept a new position with the USACE. He will be available for the new project manager and RAB members and would be available to come back occasionally, as needed. He hopes to meet with RAB members before he leaves, probably in February after his replacement is identified.

The group did not schedule the next meeting. An announcement will be sent in early 2010, after the start of the New Year. It was noted that the FS will be reviewed by the regulatory agencies in Spring/Summer 2010 so the next RAB meeting most likely will be in Fall 2010.

Meeting Adjourned at 8:30 pm.