

**Subject:** Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)

**Location of Meeting:** Karnack Community Center, Karnack, Texas

**Date of Meeting:** January 21, 2016, 6:00 – 7:00 PM

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**Meeting Participants:**

**LHAAP/BRAC:** Rose M. Zeiler

**USACE:** Aaron Williams, Richard Smith

**USAEC:** Nicholas Smith

**AECOM:** Mark Heaston, Marwan Salameh, Debra Richmann

**TCEQ:** April Palmie

**USEPA Region 6:** Rich Mayer, Kent Becher (USGS liaison),

**USFWS:** Paul Bruckwicki

**RAB:** **Present:** Paul Fortune, Charles Dixon, Judy Vandeventer, Tom Walker, Carol Fortune, Richard LeTourneau, Nigel R. Shivers, Terry Britt  
**Absent:** Ken Burkhalter, Robert Cargill, Lee Guice, Judith Johnson, Ted Kurz, James Lambright, Pickens Winters, John Pollard, Jr.

**Public:** Dan Murphy, Dawn Orsak (CLI-TAG), Mark Shepperd, Mike McComb, Erik Ducough

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An agenda for the RAB meeting, three handouts (Groundwater Treatment Plant [GWTP] Treated Groundwater Volumes, Surface Water Sampling Results, and LHAAP Perimeter Well Sampling Results), and a color copy of the AECOM slide presentation were provided to meeting attendees.

**Welcome and Introduction**

The RAB Community Co-Chair (Paul Fortune) called the meeting to order and asked if there was anyone present that had not attended before. Dan Murphy and Mark Sheppard introduced themselves, as did Debra Richmann who is replacing Mark Heaston as the AECOM Project Manager.

## **Open Items - Dr. Rose M. Zeiler**

### ***RAB Administrative Issues***

#### *Minutes*

Dr. Zeiler asked Mark Heaston about the current status of the October 2015 RAB minutes. Mark responded that AECOM was late issuing them, but they would be distributed to the RAB members soon.

#### *Website Update*

Dr. Zeiler asked Mark if he had visited the website to see if there has been any increase in usage since the RAB questionnaires were distributed. One of the common responses on the questionnaire was that most people were not aware of the RAB. Mark indicated he had not done so yet. The RAB minutes from the June 2015 meeting and the agenda for this January 2016 RAB meeting are currently posted on the website. It also has a calendar showing when and where upcoming sampling events at Longhorn will happen.

#### *RAB Membership Drive and LHAAP Community Involvement Questionnaire*

Dr. Zeiler explained that the questionnaires that were sent to the community recently will be used to evaluate the need to update the current Community Relations Plan (CRP). Based on the responses received, the Army will determine if the current plan is adequately achieving the community involvement objectives. Dr. Zeiler indicated many responses to questions about the RAB indicate that many people are unaware that it even exists. So, the Army is trying to better communicate to the public what the RAB does and where and when RAB meetings will be held. The Army posted fliers/notices for this meeting in a variety of public places and engaged several local radio stations to broadcast a public service announcement for the current RAB meeting. It was confirmed that at least the local Karnack station did. Dr. Zeiler indicated that the Army is continuing its review of the questionnaire responses and will provide a summary at the next RAB meeting. She also said that at this point in the review, it does not appear there is a need to revise the existing CRP. Dr. Zeiler asked the attendees if there were any other administrative issues they wanted to discuss; none were identified.

### **Defense Environmental Restoration Program (DERP) Update – AECOM (Mark Heaston)**

Before beginning this part of the presentation, Dr. Zeiler asked Mark to provide some details on the active sites, especially for the new people in the audience. The Longhorn Map (Slide 5) was projected on the screen, but it was difficult to discern some of the sites, so as Mark described each of the individual sites on the Active Site List (Slide 6), Dr. Zeiler pointed them out on a larger map on the wall.

### MNA Site Updates (LHAAP-37, 46, 50, 58, 67)

- Completed LUC boundary surveys and deed recordation for all sites. The purpose of the LUCs is to restrict use of groundwater in order to protect human health and the environment.
- RACRs for LHAAP-46 and LHAAP-58 are complete (Final).
- Work on the RACRs for LHAAP-37, LHAAP-50 and LHAAP-67 is in progress and is expected to be completed within the next few months.
- Draft Year 1 Remedial Action Operation (RA-O) reports have been completed for all MNA sites, except LHAAP-37 and Year 2 RA-O reports for LHAAP-46, -58, and -67 are being prepared.
- Quarterly/Semi-Annual groundwater sampling and analysis is continuing at all of the MNA sites except LHAAP-37. Groundwater sampling is performed on a quarterly basis for the first 2 years of RA-O, and semi-annually thereafter.
- LHAAP-37 is generally lagging behind the other MNA sites due to the Bio-Plug study conducted there. Currently the groundwater at LHAAP-37 is being monitored for geochemical rebound. After the rebound study is completed and groundwater returns to pre-BioPlug study conditions, RA-O monitoring will begin.

### LHAAP-29 Update

- Work at this site has been delayed due to the dispute. However, additional field investigation to determine the extent of DNAPL has been completed. The DNAPL pool is smaller than expected; important information needed to support the FS and Remedial Design, because the contaminant mass determines how much remediation is required, which affects the cost and effectiveness of the remedy. The findings of the supplemental investigation have been documented in an RI Addendum, which is currently being reviewed by the Army.

### LHAAP-18/24 Update

Mark began by stating that LHAAP-18/24 is the largest and one of the most complex sites at LHAAP.

Dr. Zeiler said that the sampling for 1,4-dioxane discussed at the previous (October 2016) RAB meeting has been completed recently. The Army looked for the compound at LHAAP for nearly 2 decades, but did not detect it at unacceptable levels. However, groundwater standards for 1,4-dioxane have been lowered, so EPA and TCEQ asked the Army to look for it again. In the most recent sampling at LHAAP-18/24 (completed in December 2015), 1,4-dioxane was identified above the industrial groundwater standard in shallow groundwater samples collected from a small area in the western corner of LHAAP-18. Dr. Zeiler continued that although it is not going to be a major issue, it is now considered a COC, so will need to be addressed in the revised FS.

Mark said that additional data gap sampling will be performed at the site to get a better understanding of the extent of 1,4-dioxane and other COCs (perchlorate, DNAPL) in site groundwater. This will allow the Army to evaluate additional potentially applicable remedial technologies in a revised FS.

Dr. Zeiler stated that LHAAP-18/24 is the worst site at LHAAP. The GWTP was designed and built for this site and was used later to treat groundwater from LHAAP-16.

Rich Mayer suggested that the GWTP might also be used for other sites such as LHAAP-17. Slide 11 presents the amount of water collected and treated through June 2015. The amount of water treated during the second quarter was larger than during the first quarter.

Mark reviewed the sites listed on Slide 9, which are the sites where work is on hold due to the Dispute.

#### Groundwater Treatment Plant (GWTP) Update

Mark and Marwan Salameh went through the routine operations and maintenance associated with the GWTP (Slide 10) and Marwan discussed the volume of water treated at the GWTP on a monthly basis through time. The volume dropped in September due to the shutdown of the plant because the blower malfunctioned. During this period, the other treatment technologies remained active and use of the ICTs alternated to minimize potential impacts.

Nigel Shivers asked if there is a correlation between the treated water volume and rainfall; Mark responded that there are seasonal fluctuations.

#### Surface Water and Perimeter Well Sampling

Mark discussed the surface water sampling results shown in Slide 12 and directed the attendees to refer to the surface water handout with the perchlorate data. The main takeaways from the slide are that perchlorate concentrations have not exceeded the TCEQ residential groundwater medium specific concentration (MSC) in surface water samples collected from May 2009 through November 2015, and for the last 2 years or so of sampling, perchlorate has not been detected in any samples.

### **Other Environmental Restoration Issues – Dr. Zeiler**

#### LHAAP – 47 Soil Cover

Marwan and Mark described the soil cover repairs that were completed at LHAAP-47 (Slide 13).

Dr. Zeiler described how the Army repaired a cover that Army had placed over perchlorate-contaminated soil at LHAAP-47 over a decade ago to prevent erosion and transport of perchlorate in the soil to a drainage downslope of the site. She recalled that subsequent to a soil

removal action at LHAAP-50 about 2 years ago, surface water sampling was conducted to evaluate the soil removal action. It was necessary to identify any potential contribution from the perchlorate-contaminated soil (under the cover) at Site 47. Because perchlorate was detected in the drainage downslope of Site 47 (although below unacceptable levels) Army inspected the liner at Site 47 and found some damaged areas. AECOM repaired the damaged liner at LHAAP-47 by placing an approximate 100 ft x 30 ft sheet of HDPE over the damaged liner/exposed soil, covering it with a 6-inch topsoil layer, and re-seeding it. Surface soil samples were collected between the liner and the creek; COCs were detected, but at low concentrations. The ROD that includes a removal of the perchlorate contaminated soil under the damaged liner at LHAAP-47 is on hold due to the dispute.

### 1,4-Dioxane

Mark provided an update on 1,4-dioxin sampling (Slide 14), In addition to the information presented on the slide, he explained that 1,4-dioxane was used as a stabilizer in TCE so, the two compounds are frequently found together. Sampling for 1,4-dioxane has therefore only been performed at LHAAP sites with a history of chlorinate solvent use (LHAAP-03, -12, -16, -17, --29, -37, -46, -50, -58, and -67). He reiterated that the extent of 1,4-dioxane at LHAAP-18 groundwater is limited to the western corner of the site.

Dr. Zeiler went on to explain a little more about 1,4-dioxane; she said it has a specific gravity similar to water, so it isn't a "sinker" like TCE, even though the two compounds are often co-located. She also said the Army will look into developing a contingent remedy for 1,4-dioxane to address the limited area in which it occurs in shallow groundwater at LHAAP-18.

Judy Vandeventer asked if the Army has received the 1,4-dioxane sampling results yet. Dr. Zeiler responded that the Army has received them and that they have just been provided to the regulators. Marwan added that the highest concentration detected is 231µg/L.

Charles Dixon wanted to know if 1,4-dioxane is a bio-hazard and what affect it might have on Caddo Lake. No one responded with information concerning potential environmental impacts of 1,4-dioxane.

Rich indicated that EPA collected and analyzed samples from two wells used for drinking water and that the water quality is fine. Mark Sheppard asked where the wells are located. Paul Fortune and Dr. Zeiler pointed them out on the wall map; they are located along the northern boundary of LHAAP, upgradient of Caddo Lake.

Terry Britt said that TCEQ also tested groundwater samples in the past, but not samples from the distribution system. Someone mentioned the contaminated public water supply in Flint Michigan. Mark (Sheppard) stated that the drinking water wells in this area are under high pressure, so it is difficult to contaminate them. Also, the Army samples wells along the installation boundary.

Mike McComb asked Dr. Zeiler what direction the groundwater is flowing; she replied that it generally flows toward surface water bodies and eventually to Caddo Lake. Dr. Zeiler also said

that the Army is carefully monitoring shallow and intermediate groundwater at LHAAP-46, which is closest site to the installation boundary with groundwater contamination. The shallow groundwater is the most highly contaminated zone.

April Palmie asked Dr. Zeiler to discuss the depths of the LHAAP monitoring wells compared to the public water supply wells. Dr. Zeiler responded that the shallow wells are typically about 25 ft deep and currently are dry at LHAAP-46, and the intermediate wells are generally between 40 ft and 50 ft deep. Terry Britt, who is a member of the Board of Caddo Lake Water Supply Corporation, stated that the drinking water wells are much deeper than the contaminated groundwater zones. The well screens start at least 150 ft lower.

Richard LeTourneau asked if the 1,4-dioxane results will be discussed at the next RAB meeting. Dr. Zeiler responded that they would be if the RAB members want to see them, and also indicated that the Army will prepare a Fact Sheet to hand out at the meeting. It was also noted that the results from the second round of confirmation sampling at LHAAP-18/24 will probably not be included, because that sampling won't happen until March.

#### CRP/CIP Questionnaire

Mark and Dr. Zeiler discussed the distribution and responses to the CIP questionnaires that were mailed out to more than 1,500 addresses in the Karnack and Uncertain, TX zip codes on October 30th, shortly after the last RAB meeting. Mark described how he conducted the bulk mailing and indicated that the cut-off for responses was set at the end of December. Dr. Zeiler said many responses indicated that the respondents were completely unaware that the RAB exists. To increase awareness, the Army implemented several of the suggestions contained in the 71 questionnaires returned from the community. For example, the Army prepared a public service announcement for this RAB to be aired on the radio and provided it to three local radio stations, including KMHT in Marshall and two stations in Shreveport. Monthly notices are also published in the newspaper and for this RAB, notices were also posted at the post office and general store. Mark indicated that only 15 individuals who responded to the questionnaire provided mailing addresses; those people were mailed individual RAB announcements and will continue to be mailed announcements going forward. One of the new attendees, Mike McComb, indicated that the letter he received for this RAB was the most effective means of communication from his perspective. Paul also suggested that notices for future RABs be posted at the Caddo Lake Institute.

#### Dispute Status Update

Dr. Zeiler indicated there were no new developments on the dispute.

#### **Next RAB Meeting Schedule and Closing Remarks**

The next RAB meeting will be on **April 21, 2016** at the same place and time. She then opened the meeting up for any questions from the attendees.

- Dan Murphy asked how long it takes to clean up the groundwater plumes. Dr. Zeiler responded that most of the COCs at Longhorn are VOCs, which require a long time to clean up. As an example, she discussed the bio-plug study at LHAAP-37 where a pilot test was performed by injecting air, nutrients, and microbes on a 6-ft spacing to enhance bio-degradation of VOCs. The test was performed over a 2-year period, but ultimately it didn't work.

She also indicated the Army considers achievement of Remedy in Place (RIP) a major milestone in the cleanup process, and that is typically followed by a period of RA-O and associated long-term monitoring for effectiveness.

- Paul invited the new visitors to join the RAB and asked if there is an application posted on the website.
- Dr. Zeiler asked for any requests for topics to be included in the next RAB meeting:
  - Recap status/activities at LHAAP-29
  - Review 1,4-dioxane results for LHAAP-18/24

**Adjourn** – Motion to adjourn made by Judy Vandeventer, seconded by Carol.

**October Meeting Attachments and Handouts:**

- Meeting Agenda
- AECOM PowerPoint Presentation
- GWTP Treated Groundwater Volumes Handout
- Surface Water Sampling Results Handout
- LHAAP Perimeter Well Sampling Results Handout

## *Acronyms*

AECOM	AECOM Technical Services, Inc.
BRAC	Base Realignment and Closure
CIP	Community Involvement Plan
CLI	Caddo Lake Institute
COC	Contaminant of Concern
CRP	Community Relations Plan
DERP	Defense Environment Response Program
DNAPL	Dense Non-Aqueous Phase Liquid
FS	Feasibility Study
ft	foot/feet
GWTP	Groundwater Treatment Plant
HDPE	High-Density Polyethylene
ICTs	Interceptor Collection Trench
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Control
MNA	Monitored Natural Attenuation
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RA-O	Remedial Action Operations
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
TAG	Technical Assistance Grant
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds