



**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 16, 2020, 6:00 PM Central Standard Time (CST)**

Meeting Participants:

Army BRAC: Rose M. Zeiler
 USACE: Aaron Williams and Scottie Fiehler
 USAEC: Andrew Maly
 Bhate: Kim Nemmers, Scott Beesinger, and Sally Smith
 APTIM: Bill Foss
 USEPA Region 6: Janetta Coats, Bill Rhotenberry, and Kent Becher-USGS Liaison
 TCEQ: April Palmie
 USFWS: Paul Bruckwicki
 RAB: Present: Judy VanDeventer, Deon Hall, John Fortune, Charles Dixon,
 Richard LeTourneau, Tom Walker, Nigel R. Shivers, and Sharron McAvoy
 Absent: Terry Britt; John Pollard, Jr.
 Public: Laura-Ashley Overdyke (Executive Director of the Caddo Lake Institute
 [CLI]); George Rice (CLI); Joell Beesinger; Jack Richards, Sr; James Pratt

An agenda for the RAB meeting, a color copy of the Bhate Environmental Associates, Inc. (Bhate) slide presentation, and handouts (see list at end of meeting minutes) were provided for meeting attendees.

Welcome and Introduction

Ms. Judy VanDeventer, the RAB Co-Chair, called the meeting to order at 6:00 pm. Ms. VanDeventer asked new RAB attendees to stand up. Mr. Jack Richards is a first time attendee and he lives by the lake. Mr. James Pratt said he worked at LHAAP early on in the remediation process and has been away for a while but he wanted to stop in and see how things are going. Mr. Scottie Fiehler said that he is with United States Army Corps of Engineers (USACE) and that he had been to a RAB meeting years ago and is Aaron William’s supervisor. Mr. Andrew Maly said that he is with the United States Army Environmental Command (USAEC) and has been to the RAB many times for the USAEC, but was attending this meeting because Ms. Amanda Sherman, who had been assigned the project for USAEC, was being promoted. Ms. Rose M. Zeiler introduced Mr. Bill Rhotenberry with the United States Environmental Protection Agency (USEPA) as the person who is replacing Mr. Rich Mayer, who retired in December 2019. Ms. Sally Smith, the Bhate Safety Director, then gave out Bhate’s 2019 Safety Excellence award to Mr. Scott Beesinger, Site Manager for LHAAP.

Ms. Zeiler explained the purpose of the RAB is to promote community awareness and obtain constructive community review and comments on environmental restoration activities. Ms. Zeiler stated the importance of informing the community and that there is a website (www.longhornaap.com) where information is available such as activities and links for the sites.



Ms. Zeiler explained that the final LHAAP documents are placed into the AR quarterly, but critical documents will be available on the website by site once finalized for public access going forward. Ms. Janetta Coats asked if the Army is still sending documents to the information repository at the Marshall library. Ms. Zeiler confirmed that finalized documents are sent to the library but that the library only wants compact discs (CDs). Ms. Zeiler asked that she be notified if a Technical Assistance Grant (TAG) or RAB member needs a copy of a document.

Ms. Zeiler announced that Ms. Carol Fortune had resigned from the RAB and asked that names of persons interested in joining the RAB be passed along. Ms. VanDeventer said she had spoken with Mr. Terry Britt and that he still wanted to be on the RAB but that he was having trouble getting to the meeting due to personal issues.

Ms. Zeiler asked if there were any questions or concerns about the October 2019 RAB meeting minutes. Mr. John Fortune made a motion to accept the October 2019 meeting minutes. Ms. Sharron McAvoy seconded the motion.

Defense Environmental Restoration

Overview of Sites

Ms. Kim Nemmers discussed the field work completed since the previous RAB Meeting. Ms. Nemmers said that the remedial action for the soil excavation at LHAAP-03 was on hold due to rainfall events and that one side wall required additional excavation and then the site would be backfilled. Ms. Nemmers explained that remedial action operation (RA-O) sampling was completed at two sites (LHAAP-58 and LHAAP-18/24) in December and that RA-O sampling is completed to evaluate remedies that are in place. Ms. Nemmers said that in-situ bioremediation (ISB) injections were completed at LHAAP-04 and LHAAP-16 and that Mr. Bill Foss would discuss further on the next slides.

LHAAP-04

Mr. Foss provided an update on the injection at LHAAP-04. Mr. Foss explained that injections were completed at 25 locations at the site, which started in October and finished in November 2019. Mr. Foss said that a total of 37,100 gallons of emulsified vegetable oil (EVO), nutrients, and water solution were injected into the locations at LHAAP-04. Mr. Foss said that the injections were shallow (from 6 to 20 feet below ground surface [bgs]) and some daylighting occurred. Mr. Foss explained that the injection pressure and flow was lowered, which stopped the daylighting. Mr. Foss explained that daylighting is when the injectate comes back up to the surface. Mr. Foss explained that this was often observed around tree roots at LHAAP-04.

Mr. Foss stated that the first round of design effectiveness monitoring was completed. Mr. Foss explained that this monitoring was to evaluate total organic carbon (TOC) in the aquifer around the wells in the treatment area (distribution of the injectate). Mr. Foss explained that the first round of performance monitoring would be completed in February 2020 to evaluate the effect of the injectate from the contaminants. Mr. Richards asked if the grey buildings shown on the map were still present. Mr. Foss said that with the exception of the building to the south, which is the fire station, buildings are not present except for the foundations. Mr. Pratt asked about



the statement in the slides that says injected solution reached several of the most contaminated wells during injection, confirming radius of influence. Mr. Foss said that the solution actually rose up and popped off well caps on a couple of the monitoring wells, which was verification and required slowing of flow. Mr. Foss said that milky white material was also observed in many of the wells, which also confirmed distribution. Mr. Nigel Shivers asked if this site is where the power plant was located. Mr. Foss confirmed that the site is just on the south side of where the power plant was located.

LHAAP-16

Mr. Foss then discussed LHAAP-16 and explained that this is the site where installation of monitoring wells took place across the creek, which was completed last summer. Mr. Foss said that the injections started in September 2019 and were completed a few days before Christmas. Mr. Foss said that a little over 84,000 gallons of EVO, nutrients, and bio-augmentation culture (added bacteria) were injected at LHAAP-16. Mr. Foss explained that the injections included bio-augmentation to help degrade the contaminants in the groundwater. Mr. Foss said that this material was placed into 78 direct push injection locations as well as 22 injection wells across the site. Mr. Foss mentioned that a couple of areas had injections with recirculation by pumping to make sure there was distribution of the injectate. Mr. Foss stated that there were no real issues with daylighting because the injections were deeper. Mr. Foss said that the bayou was monitored throughout the injection event. Mr. Foss said that the first round of samples to evaluate design effectiveness had been completed except for Landfill Biobarrier #2 and that the results were being evaluated. If necessary, Mr. Foss said another round of sampling would be completed to evaluate the distribution of the injectate. Mr. Foss said that the first quarterly performance sampling event to evaluate the effect of the injection on the contamination will be in March 2020.

LHAAP-67

Mr. Foss explained that two new monitoring wells were installed, per the Five Year Review (FYR) to define the edge of the plume. Mr. Foss said that these two new wells were sampled in the latest sampling round completed in October 2019 and no contamination was detected. Mr. Foss concluded that this sampling met the intent of the FYR comment and that the plume was fully delineated.

Documents in Process

Ms. Nemmers reiterated what Ms. Zeiler had said about the documents being placed into the AR when final and that critical documents will be placed on the website under the site link. Ms. Nemmers discussed that the Response Action Completion Report (RACR) was being prepared for LHAAP-04 to document the injections completed and evaluate the distribution as Mr. Foss had discussed. Ms. Nemmers explained that the other reports listed are for performance monitoring (RA-O) over the course of the year for those sites. Also, the quarterly groundwater treatment plant (GWTP) reports document the field work and activities and that is in process. Ms. Nemmers explained that the quarterly GWTP reports often include the groundwater data from LHAAP-18/24 because this is the water that is extracted and treated at the GWTP.

LHAAP-50



Mr. Foss explained that LHAAP-50 has plumes of perchlorate and trichloroethylene (TCE) and the remedy in place is monitored natural attenuation (MNA). Mr. Foss stated that the MNA evaluations indicated that the remedy was not effective, so the Contingency Remedy from the ROD is being implemented. Mr. Foss said that an Explanation of Significant Difference (ESD) was then prepared to implement the contingency remedy to kick-start degradation. Ms. Zeiler explained that the ROD had the contingency remedy of ISB included to ensure there was an approved remedy if MNA did not work so that a whole new ROD was not required. However, the ROD did require an ESD be written once the contingency remedy was determined to be needed. Mr. Foss pointed out the proposed injection locations on Slide 17. Mr. Foss said that the targeted wells were 50WW12, 50WW13, and 50WW14 as the source for the broader plume. Mr. Foss said the injectate will be the same as discussed for the other sites using ISB. Mr. Foss explained that the goal is to knock down levels in that area for MNA to continue on and take over from there.

Look Ahead

Ms. Nemmers then discussed the 3-month look ahead for LHAAP field work. Ms. Nemmers explained that LHAAP-03 required some additional excavation and then backfilling to be completed once weather allowed. Ms. Nemmers said that LHAAP-17 had the same issue where it required backfilling, weather allowing. Ms. Nemmers said that performance monitoring was required at LHAAP-04 and LHAAP-16, as previously presented by Mr. Foss. RA-O sampling was required at LHAAP-46 and LHAAP-58, where remedies were already in place. Ms. Nemmers said that the remedy implementation for LHAAP-50 is planned to be completed prior to the next RAB meeting.

Ms. Nemmers discussed the document look-ahead. Ms. Nemmers explained that finalization of documents follows a process whereby the Army review and the Regulators review the documents, which takes time.

Groundwater Treatment Plant

Ms. Nemmers stated that the outflow presented is a little lower than shown in previous months, which is primarily due to little water being discharged from the INF Pond. Ms. Nemmers also said that some lines were repaired at LHAAP-18/24. Ms. Nemmers said that the graph shows discharge to Harrison Bayou. Ms. Nemmers said that with the storm over the weekend that the GWTP is still down for remaining repairs. Ms. Nemmers reported no major issues at the GWTP.

Surface Water Sampling

Ms. Nemmers said that a quarterly sample was collected in October 2019 and that there were no exceedances from that sample. Ms. Nemmers said that the exceedance shown on the chart provided is from July 2019 and that the sample location was resampled and did not have an exceedance. Ms. Nemmers directed the public to the handouts for the actual data from these sampling events. Mr. George Rice asked about the reason for the spike of perchlorate detected in surface water in the one sample. Ms. Nemmers said that groundwater data near the surface water was evaluated and that no source for the spike was found. Ms. Nemmers said that the location where the spike occurred was resampled on July 30, 2019, and while perchlorate was detected that the detection was well below the screening criteria. Ms. Zeiler said that the Army



asked Bhate to see if there was an extraction well or interceptor trench (ICT) down that could have resulted in the exceedance and that no reason for the spike was identified. Mr. Rice confirmed that the location was resampled and Ms. Nemmers pointed out the note at the bottom of the graph with the details of the resampling.

LHAAP-18/24, LHAAP-29, and LHAAP-47

Mr. Aaron Williams said that he was presenting the three sites currently contracted to HDR, Inc. (LHAAP-18/24, LHAAP-29, and LHAAP-47) that required a ROD. Mr. Williams said that the final ROD for LHAAP-18/24 was close because the ROD had been signed by the Army and it was sent to the Regulators for their signature and concurrence. Mr. Williams said that a notice will be placed in the paper once it is signed letting the public know that the ROD is in the Marshall Library as well as on the website. For LHAAP-29, the ROD is signed and available for public review at the Marshall Library.

Mr. Williams said that the presence of dry wells and aging data at LHAAP-47 required that additional data be collected prior to finalization of the ROD and that additional investigation had been completed. Mr. Williams explained that during the additional sampling there was a detection of TCE of 120,000 micrograms per liter ($\mu\text{g/L}$) near one of the buildings and stated that the remedy previously selected would not be effective for TCE at that concentration. Mr. Williams said that the Army is in the process of defining the area and will then have to go back to the Feasibility Study to evaluate new remedies that would effectively treat this area. Ms. Zeiler said that the Army had taken a step back in the process from the ROD phase. Mr. Williams discussed the field work completed as outlined on the slide. Mr. Williams showed the area of concern at LHAAP-47 by Building 46A. Mr. Williams explained that clean soil results were collected to the north but not defined to the south, east, and west for groundwater protection. Mr. Williams said that the same is true for groundwater which is not fully defined to the north. Mr. Williams explained that the contamination has to be defined for remedy selection so additional investigation is going to be completed.

Mr. Williams gave an update on the FYR regarding additional well installations to define plumes at two sites as well as implement the contingency remedy at LHAAP-50, which Mr. Foss had previously covered. Mr. Williams pointed out the LHAAP-12 well location, which has been installed, intended to define the plume. Mr. Williams explained that the Army is awaiting validated laboratory results from groundwater samples collected in December 2019. Mr. Williams said that the new well at LHAAP-50 and the two new wells at LHAAP-67 didn't contain detectable contaminants of concern. Ms. Zeiler pointed out that the plume for LHAAP-50 is smaller than originally thought based upon the additional well installed.

RAB Questions

Prior to wrapping up the meeting, Ms. Zeiler welcomed questions. Mr. Fortune asked for information on injecting EVO. Mr. Foss explained that there is a trailer system that is mobilized to the site that has a manifold that allows for injection into multiple injection points or wells with a tank for mixing and a pressure gauge, valve, and flow meter on each line to control flow of the materials. Mr. Foss explained that the trailer has a generator and variable speed pump. Mr. Foss



said that there is usually a design flow or pressure that is not to be exceeded. Each injection point is set up and then the injections start. Ms. Zeiler pointed out that the injections require a long time to complete.

Mr. Deon Hall asked if there are metals, like mercury, that exceed at the sites. Ms. Zeiler said there are a few sites that have arsenic but that no sites have mercury. Mr. Foss mentioned the soil removal of metals at LHAAP-03. Ms. Zeiler pointed out that the LHAAP-03 site had been a paint shop previously, which is why metals were present. Ms. April Palmie stated that the effluent from the GWTP is monitored for metals. Ms. Laura-Ashley Overdyke asked if that means that the water going to the bayou is tested for metals. Ms. Palmie said that certain metals are present within LHAAP-18/24 but are sporadic. So the effluent is tested to ensure that Texas Commission on Environmental Quality (TCEQ) limits are met even though the metals present are not site wide. Mr. Hall asked if arsenic was the main concern to which Ms. Zeiler confirmed and stated that arsenic is often naturally occurring at levels that exceed screening levels.

Ms. Overdyke asked for confirmation that the bayou is being visually inspected for the white milky material. Mr. Foss confirmed and then explained that dissolved oxygen (DO) readings are also collected after a rain event. Mr. Foss explained that the material injected causes DO to deplete so this allowed further evaluation of the bayou beyond just visual. Ms. Zeiler pointed out that part of the remedy at LHAAP-16 included a barrier which was very close to the bayou. Ms. Palmie explained that DO is a good thing to use for field screenings because it can be tested in the field real time to see if there are any issues. Ms. Overdyke asked if the removal of DO is required for the bacteria used to reduce the chlorinated compounds. Mr. Foss said that the injection solutions are low DO for this reason and that the remedial process should reduce the DO even further. Mr. Foss said that low oxygen in surface water is also a bad thing for the environment, particularly the fish. Mr. Foss said that all of the DO readings measured during and after the injections in the bayou were above 5 mg/L.

Mr. Richard LeTourneau confirmed that samples are not tested onsite. Mr. Zeiler said that all samples requiring laboratory testing are sent offsite.

Next RAB Meeting Schedule and Closing Remarks

Ms. Zeiler then discussed the next meeting with the RAB members. It was decided that the next RAB Meeting will be held on **Wednesday, April 15, 2020**, with the **meeting starting at 6:00 pm CDT** at the Karnack Community Center.

Adjourn

Mr. Hall made the motion to adjourn and Mr. LeTourneau seconded the motion. The meeting adjourned at 6:45 pm CDT.

January 2020 Meeting Attachments and Handouts:

- Color Copy of Bhate Presentation Slides
- GWTP – Processed Groundwater Volumes Handout
- Surface Water Sampling Handout