Location: Memphis Depot Industrial Park, 2241 Truitt Street, Memphis, Tennessee

Participants:

CALIBRE: BRAC Environmental Coordinator, Joan Hutton

Tennessee Department of Environment and Conservation (TDEC) Division of Remediation: DDMT Project Manager, Jamie Woods

U.S. Environmental Protection Agency (USEPA), Region 4: DDMT Project Manager, Julie Corkran; Hydrogeologist, Ben Bentkowski

HDR EOC: Project Manager, Tom Holmes; Denise Cooper

DDMT Site Tour

Team toured the MI to view well locations and areas of designated plumes; the off depot AS/SVE area, Kyle-Rozelle Street area between Dunn Field and the off depot area, the off-site plume area northeast of Dunn Field, and Dunn Field.

Army/HDR will continue pursuing options for obtaining access to MW-33 which has been blocked by the property owner. The team identified a TDEC well on Wabash Ave. that needs a secure cap. The team noted a potential source of the contaminant plume upgradient of Dunn Field near 2224 E. Person; TDEC will incorporate the location into their ongoing source investigation.

Annual LTM Report – 2013 Response to Comments Discussion

Ms. Hutton began the discussion by noting that the Department of Army (DA) was still reviewing comments regarding Dunn Field (DF), so she would not have any input about DF at this time. She did want to capture USEPA's comments and ensure DA understood their position on the issues.

Ms. Corkran indicated that USEPA wanted to make sure they were clear on the history of past decisions regarding the upgradient contaminant plume migrating onto the northeast corner of DF. A key issue is the potential for the upgradient plume to prevent the Off Depot air sparge/soil vapor extraction (AS/SVE) system from achieving remediation goals (RGs) in accordance with the current schedule. She also indicated that USEPA would review the DF Findings of Suitability to Transfer in order to be prepared for the eventual sale of the remainder of DF.

Prior to the meeting, Mr. Woods provided USEPA and Army with abbreviated copies of the earlier TDEC source investigations for the upgradient plume, and stated he was awaiting approval to release the latest report. He provided Ms. Corkran with the USEPA point of contact for the source investigation. Mr. Woods also indicated that if the upgradient source was identified, TDEC would remediate the source, but not the groundwater plume.

The team discussed USEPA comments regarding the need for additional monitoring wells on the Main Installation (MI) and Mr. Holmes reviewed the map of proposed fluvial aquifer well locations (MW-262 to MW-273) in the meeting handout. USEPA and TDEC were in general agreement with the proposed well locations. DA will submit a memorandum with proposed well locations for review

by USEPA and TDEC and the locations will be included in a work plan to be prepared prior to well installation.

Mr. Bentkowski questioned if HDR compared changes in groundwater elevations over the years and the possible impact on groundwater flow direction assumptions. Mr. Holmes stated current and historical groundwater elevations are compared during report preparation and that changes have not been observed except when new wells provided additional information. A review will be included in the proposed monitoring well memo.

USEPA and TDEC agreed the proposed Intermediate Aquifer (IAQ) well (MW-274) downgradient of MW-256, was appropriately located based on the available information. The team discussed a USEPA suggestion to advance the boring into the Memphis Sand for a grab water sample before installing the well screen in the IAQ. Based on the additional drilling depth (~100 feet) and the potential difficulty in installing the well, the suggestion was not accepted. HDR will continue to include cross-section A showing the window and deep sentinel wells with PCE and TCE results to assist the team in tracking contaminants in the IAQ. Mr. Bentkowski stated that USEPA will track MW-254 because it is downgradient of contamination in the Memphis Sand.

Following review of the proposed wells, the team discussed Mr. Bentkowski's notes on Figures 19 and 20 of the report. Mr. Bentkowski stated many of the notes were aids for his review and discussion of each was not necessary. The notes were reviewed for unresolved questions and the discussion concluded.

The team discussed the USEPA recommendation for investigation of small soil source areas that may be contributing to rebound and lack of contaminant reduction. Mr. Holmes summarized the 2008 source evaluation and following soil investigation of MI source areas. He noted that the study found areas with elevated VOC concentrations but the concentrations did not warrant soil remediation. Ms. Cooper provided background information on the initial site investigations and BRAC sample analyses. Mr. Holmes was doubtful that investigation in areas with lower groundwater concentrations would provide actionable results. USEPA will review past reports such as the 2008 investigation, summarized in the 2010 MI Interim Remedial Action Completion Report (IRACR), and the SMP table listing environmental restoration sites in considering the need for additional investigation. Ms. Corkran stated USEPA wants to be sure the previous site work was done in conformance with regulatory guidance.

Contaminant rebound and increasing concentrations at some MI wells led to discussion of various actions to address areas not currently impacted by EBT. The need for additional remedial action will be reviewed as part of the supplemental remedial investigation (SRI) and focused feasibility study (FFS) currently being planned. Initial actions being considered are expansion of EBT to additional areas and air sparging with soil vapor extraction (AS/SVE). Mr. Holmes stated existing monitoring wells can be used to expand treatment in some areas but additional injection wells may be needed to keep some monitoring wells as control points. AS/SVE has been successful in the off depot area but the plumes at the MI are more extensive and have lower concentrations, thus AS/SVE may not be cost-effective there. Mr. Bentkowski noted that horizontal sparge wells have been installed at Camp Lejeune and offered to provide additional information.

Locations where reductive dechlorination has not been complete (stalled at cDCE) also need to be addressed. Ms. Hutton noted that dehalococcoides ethogenes (DHc), the only bacteria shown to fully dechlorinate PCE and TCE, was not detected in MI groundwater samples. Mr. Holmes mentioned the bench scale tests performed for the Off Depot remedial design and previous contacts with consultants regarding bioaugmentation. Further review will be made for the FFS.

The scope of additional investigation in support of a MI ROD Amendment/ ESD was discussed briefly:

- Review previous natural attenuation study and groundwater modeling: Mr. Holmes stated that the modeling performed for the MI source investigation and included in the MI IRACR was consistent with the groundwater monitoring results in the downgradient sentinel wells. However, further review is planned.
- Re-evaluate potential for VOC transport in the MAQ from the MI to the nearest well in the Allen Well Field: Mr. Woods briefly described a site in the Memphis area where significant groundwater contamination was found in the MAQ with limited impact at nearby water supply wells. He also noted the lack of communication between TDEC and Memphis Light, Gas and Water regarding well data and groundwater analyses at well fields.
- Need for response action in IAQ Review current CSM understanding that successful treatment in fluvial aquifer will reduce concentrations in IAQ: The team has historically agreed that the contaminant sources were in the fluvial aquifer, not the IAQ, and that remedial actions in the fluvial aquifer would lower contaminant concentrations in the IAQ. Mr. Holmes noted potential for the north-central plume (MW-258) to impact the sentinel wells in the window; EBT is underway at the other plumes close to the window. Further review of potential actions in the IAQ is necessary. Ms. Corkran stated the ROD language should have been more specific as to contingency actions for the IAQ. Ms. Corkran stated the National Contingency Plan (NCP) (and the MI RAOs) indicates remediation should keep plumes from moving horizontally or vertically, so future strategies should address vertical migration to IAQ and MAQ. Current site conditions are inconsistent with RAOs of the MI ROD as there is vertical and horizontal migration of contamination above the MCLs.
- Clarify selection of MNA as a MI remedy component for fluvial aquifer: Team discussed the potential for MNA on the MI. Mr. Holmes stated that previous review had noted the aerobic nature of the fluvial aquifer and lack of naturally occurring organic carbon. Physical processes (attenuation and dilution) may be the only components. Mr. Bentkowski stated his thought that remedies should not try to completely change aquifer conditions and therefore remedies other than EBT should be considered.
- On-site impacts from possible off-site sources: Will be addressed by proposed well locations.
- Response actions in addition to, or other than, EBT in the fluvial aquifer: Discussed previously.

USEPA reported that based on their review of the Annual LTM report they will note that MI groundwater is not confined and will change the groundwater Environmental Indicator (EI) to "not

under control." USEPA indicated the change should not impact future activities, but it will be tracked and will prompt USEPA to remind DA of the issue on a regular basis. The change does not constitute a compliance issue, but the EI database is provided to Congress and used to obtain funding.

The team discussed the LTM sampling frequency. USEPA comments suggested that DA optimize sampling frequency. Mr. Holmes summarized the current sampling frequency and conditions that result in changes to the frequency. USEPA concurred that the sample frequency logic was reasonable but suggested further review. HDR will re-evaluate LTM plans for DDMT and offer suggested changes in a future report.

Mr. Holmes noted USEPA comments on the MI Y3 EBT report are due 4 June 2014 and will be used in developing the scope of the SRI and FFS. Ms. Corkran will seek additional resources to review the document and provide comments by 30 June 2014.

Ms. Hutton raised the question of usability of results with reporting limits above the MCLs, which has been a problem with MI EBT monitoring. Mr. Holmes stated the issue was matrix interference from the lactate injections for EBT near the injection wells. The team agreed that samples with standard reporting limits and concentrations below MCLs would be needed to meet remedial action objectives.

The team discussed USEPA's comment regarding vapor intrusion (VI). (See USEPA comment letter on the 2014 Site Management Plan dated 20 December 2013.) Mr. Holmes summarized the VI investigation conducted as part of the Off Depot groundwater remedial action. Ms. Corkran and Mr. Bentkowski discussed the guidance that is being finalized and will review the VI investigation report to determine the need for further VI investigation. Mr. Bentkowski stated that when USEPA VI requirements were finalized they would be strictly applied regardless of VI guidance issued by others. Ms. Corkran indicated that the most recent 5-Year Review should have included a VI evaluation and it should be addressed prior to the next 5-Year Review; she will evaluate other 5-Year Reviews that have been approved by USEPA to see how VI has been successfully presented. Mr. Woods indicated that TDEC's VI rules are expected to be issued this year and he will make sure the team receives the rules upon issuance.

HDR questioned when the 2013 Annual LTM report could be finalized since DA responses to USEPA's DF comments were forthcoming. USEPA suggested that HDR/DA incorporate their MI comments and include the Response to Comments as an appendix with notes indicating the DF comments that will be addressed in a forthcoming report.

Action Items

USEPA will provide the Camp Lejeune report describing installation of horizontal air sparge wells.

DA will provide proposed well location memorandum.

DA will submit Rev.1 2013 LTM report.

TDEC will provide complete copies of their offsite investigation reports.