Response to Comments
Draft Technical Memorandum for the Site 89 Monitoring Well Abandonment Work Plan
Marine Corps Base Camp Lejeune
North Carolina

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The purpose of this document is to address comments on the Draft Technical Memorandum for the Site 89 Monitoring Well Abandonment Work Plan, Marine Corps Base Camp Lejeune (MCB Camp Lejeune), North Carolina. The North Carolina Department of Environmental Quality (NCDEQ) and the United States Environmental Protection Agency (EPA) Region IV comments are listed below. Responses to comments are provided in bold.

NCDEQ Comments (dated January 12, 2016)

1. The second paragraph of Section 2.0 states that the well abandonment forms will be submitted by the drillers. Please direct them to use the latest forms on the Division of Water Resources Web Site.

   Driller will be directed to the latest forms of the Division of Water Resources Web Site as recommended.

2. IR89-MW01 is the most down gradient monitoring well in this area. Since it has been several years since this well has been sampled please re-sample this well to confirm that concentrations are still decreasing and the high concentration plume has not moved to this area.

   IR89-MW01 will be sampled as recommended during the next scheduled system downtime. A path forward will be determined based on the results as outlined in the rationale for abandonment in Table 1.

   IR89-MW02 has been one of the most contaminated wells in this area. However, the contaminants of concern (COCs) in this area have decreased significantly and other shallow monitoring wells are located in this area of the plume and in the middle of the Air Sparging system. You may or may not want to resample this monitoring well before abandonment. The 2010 data in monitoring well MW51 is about an order of magnitude lower than the 2010 and 2015 data in adjacent monitoring well MW02.

   IR89-MW02 will be sampled as recommended during the next scheduled system downtime. A path forward will be determined based on the results as outlined in the rationale for abandonment in Table 1.

3. IR89-MW02IW, MW03, MW03IW, MW03DW, MW10, MW24IW, MW45, MW50, MW52DW, MW53DW, MW54, MW81DW, and MW82DW have decreasing trends and are up-gradient of other monitoring wells or surrounded by other monitoring wells at the same depth or have low to Non-Detect concentrations and are up-gradient of the Air Sparging system and should be abandoned.
   IR89-MW02IW, MW03, MW03IW, MW03DW, MW10, MW24IW, MW45, MW50, MW52DW, MW53DW, MW54, MW81DW, and MW82DW will be sampled as recommended during the next scheduled system downtime. A path forward will be determined based on the results as outlined in each well's rationale for abandonment in Table 1.

EPA Comments

(dated January 29, 2016)

1. As stated in the Section 1, the groundwater monitoring wells are proposed for abandonment because they are not included in the Long-Term Monitoring network, and abandonment will aid in optimization of the air sparging system which includes vertical and horizontal air sparging wells. More information should be provided regarding the justification for abandoning each well. The logic should identify whether the monitoring well impacts the air sparging system or is only no longer needed as part of the long-term monitoring system. For example, the middle Castle Hayne monitoring wells are screened below the screens of the air sparging wells, so should not impact optimization of the system. The work plan should identify if well construction of the deep wells is impacting the air sparging system. If the deep wells are impacting optimization of the system, faulty well construction should be described.

   Justification for each well was expanded on in the rationale for abandonment in Table 1.

2. Several monitoring wells had elevated VOCs during the last sampling event. Justification for abandoning the wells that had elevated VOCs should be included. These wells should be sampled to determine current contaminant concentrations.

   All wells will be sampled as recommended during the next scheduled system downtime. A path forward will be determined based on the results as outlined rationale for abandonment in Table 1.

3. Provide justification for no longer needing water level data or VOC data from the monitoring wells. A summary table or trend data graphs of previous VOC data for each well should be provided.

   Justification for no longer needing data from monitoring wells was expanded on in the rationale for abandonment in Table 1. Historical data is provided in Attachment 1.

4. Section 1 states that after the first year of operation, the air sparging system was optimized with the objective of achieving design flow rates by installing threaded caps in wells showing pressure and turning off the system, allowing the subsurface materials to collapse and heal developed air channels. Monitoring wells that were suspected of being near air channels, near observed daylighting, and or suspected of short circuiting the system should be identified in the text and/or Table one.

   Areas of observed daylighting were identified in Figure 2.

5. Monitoring well MW53DW should not be abandoned unless daylighting/short circuiting has been observed at the well. Historical monitoring well data indicates that the last time the well was sampled was in 2011 where concentrations of TCE were 75 ppb. This monitoring well should be included in the long term monitoring program. If the well needs to be abandoned due to faulty construction, a new deep well should be installed in the vicinity of the well. If other deep wells are installed in the area of MW53DW or at depths greater than the well to characterize depth/extent of contamination in the Middle Castle Hayne Aquifer those wells should be identified. The well should be sampled to update current contaminant concentrations.

   MW53DW will be sampled as recommended during the next scheduled system downtime. A path forward will be determined based on the results as outlined in the rationale for abandonment in Table 1.

6. Section 2 states that the monitoring wells will be abandoned by grouting in place. It seems that grouting the monitoring wells in place will not correct short circuiting/daylighting issues if faulty well construction has created preferential pathways/conduits for vapor escape, i.e. poor bentonite seals above the well screen and/or conduits along the annular space of the well. Additional information should be included that describes how the monitoring wells are impacting optimization of the air sparging system, and how grouting the wells in place will seal conduits associated with the monitoring wells.

   The text has been updated to clarify the following: After wells have been identified for abandonment, the well will be inspected while the AS system is operating. If air is observed escaping from around the well, the well will be abandoned by overdrilling, if not, the well will be abandoned by grouting in place.

7. Please include monitoring well coordinates for each monitoring well proposed to be abandoned.

   Well coordinates for each monitoring well were added to Table 1 as recommended.