Message

From: Wayne Miller [Miller.Wayne@azdeq.gov]
Sent: 6/28/2018 12:17:19 AM
To: d'Almeida, Carolyn K. [dAlmeida.Carolyn@epa.gov]
CC: steve [steve@uxopro.com]
Subject: 2018-6-27 - WAFB - FYI - IS MNA now an issue - BCT Slide 40 - ROD Amendment 2 - SEE to EBR to MNA -
Attachments: 2018-6-27 - wafb - ST012 BCT slides - 6-28-2018 call.pdf

The Benzene non-containment may be a moot point. See slide 40 for first mention of MNA now. There is a possible new twist with the discussion "How can we go after 90 ppb when we were going to allow 500 ppb to float free?"

From: Wayne Miller
Sent: Wednesday, June 27, 2018 5:12 PM
To: Tina LePage <LePage.Tina@azdeq.gov>
Subject: 2018-6-27 - WAFB - FYI - ROD Amendment 2 - SEE to EBR to MNA -

I yellow highlighted the MNA portion of the Chapter 5 DESCRIPTION OF EXISTING AND REVISED REMEDIES. The rest of the text is the ROD's SEE and EBR text.

Slide 40 is where revision allowing MNA reached is first mentioned.

"Final Record of Decision Amendment 2, Groundwater, Operable Unit 2 (OU-2), Site ST012, Former Williams Air Force Base, Mesa, Arizona"; 30 October 2013

5.1 Description of Revised Remedy: Alternative ST012-3: Steam Enhanced Extraction and Enhanced Bioremediation

The Selected Remedy for groundwater at ST012 is Alternative ST012-3: Steam Enhanced Extraction and Enhanced Bioremediation, as described in the OU-2 FFS and the OU-2 Amended Proposed Plan. The specific components of this alternative were presented in summary form in Section 1.4, Description of the Revised Selected Remedy, and are fully described in this section.

Alternative ST012-3 will achieve cleanup levels by combining SEE of groundwater and LNAPL with enhanced bioremediation of the remaining contaminant plume. Individual processes will be applied in a sequential approach in the treatment area as follows:

Existing institutional controls will prohibit extraction/pumping of groundwater or installation of new wells at the site for purposes other than remediation or monitoring until cleanup levels are achieved and the existing controls (deed restrictions and Declaration of Environmental Use Restriction) are removed.

Steam will be generated on-site using one or two boilers and provide steam to injection wells. The fuel source for steam generation will be natural gas, propane, diesel, or recovered LNAPL. Recovered LNAPL may be used as fuel for the boilers if determined feasible during the remedial design. Steam injection will heat the treatment area, increasing the mobility of LNAPL and volatilizing contaminants from the groundwater and soil. Steam injection wells screened in the three zones (UWBZ, LPZ, LSZ) will be collocated with temperature monitoring points.

Multi-phase extraction will extract LNAPL, contaminated groundwater, and soil vapor from the three aquifer zones. Multi-phase extraction wells will be collocated with temperature

monitoring points. Captured LNAPL will be separated and recovered to the extent feasible to power steam generation. Contaminated groundwater will be treated using onsite air stripping and, if necessary, granular activated carbon, and treated water will be discharged to the municipal wastewater treatment plant. Soil vapor will be treated by thermal oxidation or potentially burned in the steam boiler(s).

Where it is feasible to do so (i.e., SVE wells that are screened outside the SEE footprint), the existing deep soil SVE system will continue to operate and collect vapor from contaminated soil to assist in capture of any additional soil vapor contamination as a result of steam injection. Enhanced bioremediation will proceed after the cessation of SEE activities. The criteria to cease SEE activities and proceed with enhanced bioremediation will be developed jointly by the AF, EPA, and ADEQ as part of the Remedial Design/Remedial Action Work Plan. Existing site conditions will be enhanced to promote biological activity among bacteria that feed off of contamination present at the site. Residual heat in the treatment area following cessation of steam injection is anticipated to enhance biological activity. Further modifications to enhance biological activity may include introducing food sources to promote activity, or modifying physical or chemical characteristics (e.g., dissolved oxygen, pH, temperature) to create an environment that is more hospitable to bacterial growth. The specific methods for enhanced bioremediation will be established in consultation with EPA and ADEQ based on biological and contaminant conditions after SEE implementation.

Subsequent to all active remediation processes, monitoring of natural attenuation processes will proceed. Monitoring will track the progress of contaminant attenuation and remedy effectiveness until cleanup levels are achieved.

Throughout the duration of the remedy, groundwater monitoring will be conducted in accordance with the ST012 Groundwater Monitoring Work Plan which will be updated and submitted for EPA and ADEQ review and approval as needed. One objective of monitoring during the injection of steam will be to verify that the dissolved contaminants and LNAPL are not being driven beyond the extraction system zone of capture by the injection of steam. Groundwater monitoring reports will evaluate remedy effectiveness and include recommendations for changes to remedy implementation, the monitoring network, analytical methods, and sampling methods or frequency. The number of available wells will decrease during steam injection due to the presence of heated and pressurized steam in the subsurface.

The TEE pilot study results have already indicated the effectiveness of TEE technologies such as SEE with respect to site-specific conditions. The revised groundwater remedial action at ST012 will substantially reduce the mass of JP-4 and AVGAS that impacts groundwater and will thereby reduce the time required to clean up the groundwater at ST012.

The active components (SEE and Enhanced Bioremediation) of the Selected Remedy for groundwater will be implemented until the chemical-specific cleanup levels are reached, or analysis of biological and natural attenuation related degradation suggest that contaminants will naturally degrade to the desired concentration within an overall remedial timeframe of approximately 20 years. Monitoring of groundwater will continue until attainment of all cleanup levels has been demonstrated. It is expected that cleanup levels will be attained for portions of the groundwater contaminant plume area as remedial action progresses and that the area exceeding cleanup levels will diminish over time. In the absence of alternative mutual agreement between the AF, EPA and ADEQ, cleanup levels will have been attained when monitoring results throughout the plume reach concentrations at or below the cleanup levels and remain below cleanup levels throughout a two year period of continued groundwater

monitoring after cleanup levels were initially achieved. The AF, EPA and ADEQ may agree to termination of monitoring at specific locations or for the overall plume area based on a shorter duration or other criteria upon mutual agreement. No institutional or engineering controls will be required after the remedy has achieved RAOs.

5.2 Remedial Action Objectives

The RAOs for groundwater at OU-2 were not specifically described in the OU-2 ROD and are as follows:
to prevent exposure to contaminants in water exceeding drinking water standards,
to prevent exposure to contaminants in water at concentrations exceeding 1x10-6 to 10-4 Incremental Lifetime Cancer Risk (ILCR) or a Hazard Index (HI) greater than 1 when a drinking water standard is not established, and
to restore the aquifer to drinking water and aquifer water quality standards.

The purpose of the first two RAOs is to prevent exposures to contaminants that pose a potential human health risk. Chemical-specific health-based ARARs, where available, were selected over calculated risk-based actions levels. The objective of these two RAOs is currently met by existing institutional controls that limit the site to non-residential use and prevent future exposure to groundwater by restricting the extraction of groundwater and installation of wells at the site except for investigation and remediation purposes. The purpose of the third RAO is to restore groundwater to concentrations that comply with applicable chemical-specific ARARs. Because these ARARs are based on protection of human health, restoration to these concentrations will address the risks identified in the baseline human health risk assessment.

The identification of groundwater cleanup levels based on the groundwater RAOs is documented in Table B-2 of Appendix B and summarized in Table 5-2. These cleanup levels were identified in the OU-2 ROD and have been updated based on current standards as presented in Table B-2. The OU-2 ROD identifies only COPCs. Based on the November 2012 groundwater sampling event (AMEC, 2013c), benzene, toluene, naphthalene, chromium, and nickel were detected above the OU-2 ROD action levels. Chromium and nickel have been associated with well construction materials. The only compounds related to site contamination that exceed the OU-2 ROD Amendment 2 cleanup levels are benzene, toluene, and naphthalene. Therefore, benzene, toluene, and naphthalene have been identified as COCs. The remaining ST012 compounds identified for groundwater in the OU-2 ROD remain as COPCs as presented in the OU-2 ROD.

5.3 Expected Outcome

As for the original remedy, the expected outcome of the revised groundwater remedy is that concentrations of residual LNAPL in saturated soil and dissolved contaminants in groundwater will be reduced to levels that will no longer result in contaminant concentrations in groundwater exceeding cleanup levels. The revised groundwater remedy will achieve groundwater cleanup levels in an estimated 20 years. The cleanup levels presented in Appendix B have changed since the issuance of the OU-2 ROD, but are still based on federal and state water quality standards or risk-based screening levels. Table 5-2 compares the OU-2 ROD action levels to the OU-2 ROD Amendment 2 cleanup levels. No further changes are anticipated as a result of ROD Amendment 2.

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