N60200.AR.002975
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SELECTION RATIONALE MEMORANDUM FOR PREFERRED GROUNDWATER REMEDY AT SITE 45 STEAM GENERATING PLANT NAS CECIL FIELD FL

6/1/2001

TETRA TECH NUS INC

SELECTION RATIONALE MEMORANDUM
PREFERRED GROUNDWATER REMEDY
SITE 45 – STEAM GENERATING PLANT
NAS CECIL FIELD, JACKSONVILLE, FLORIDA

1.0 INTRODUCTION

The purpose of this memorandum is to provide a rationale for the selection of monitored natural attenuation and institutional controls as the preferred groundwater remedy for Site 45 at the former Naval Air Station (NAS) Cecil Field in Jacksonville, Florida.

2.0 SITE BACKGROUND

As a result of the operation of a steam generation facility, the Site 45 soil has been contaminated with lead and vanadium. These chemicals have migrated to the groundwater, resulting in detected concentrations greater than the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs), as defined in the Florida Administrative Code (FAC) Chapter 62-777. However, because the lead exceedances were only detected in early investigations and were not confirmed by the results of later samplings, only vanadium was retained as a groundwater chemical of concern (COC).

The source area soil was removed and disposed offsite as part of an Interim Removal Action (IRA) but groundwater contamination remains.

To address this groundwater contamination, a Feasibility Study (FS) was performed for Site 45 that identified and evaluated the following three remedial alternatives:

- Alternative 1: No Action
- Alternative 2: Natural Attenuation, Institutional Controls, and Monitoring
- Alternative 3: Extraction, On-Site Treatment, Surface Discharge, Institutional Controls, and Monitoring

To supplement the FS, the attached technical memorandum was also prepared to present a more focused review of the current state-of-the-art for the treatment of vanadium in groundwater and to evaluate treatability testing options.

3.0 PREFERRED REMEDY

As a result of these efforts and of the subsequent discussions held during the meeting of June 21, 2001, the Base Realignment and Closure (BRAC) Cleanup Team (BCT) has identified Alternative 2 as the preferred remedy for the Site 45 groundwater.

4.0 SELECTION RATIONALE

The rationale for this remedy selection relies on two basic considerations:

- The human health risk resulting from the presence of the vanadium concentrations detected in the Site 45 groundwater is marginal and

- No technically proven and/or economically effective technology is currently available for the removal of the vanadium in groundwater at Site 45.

Following is an elaboration of these two considerations:

4.1 Marginal Nature of Human Health Risk

This consideration can be substantiated by the following points:

✓ Of the three main chemical-specific To Be Considered (TBC) criteria related to the Site 45 groundwater, only one, the FDEP GCTL value of 49 µg/L has been repeatedly exceeded at several locations. The other two, the FDEP Natural Attenuation (NA) default value of 490 µg/L as defined in FAC Chapter 62-777 and the United States Environmental Protection Agency (USEPA) Region 9 risk-based Preliminary Remediation Goal (PRG) of 260 µg/L have only been exceeded for one historical sampling at a single location (740 µg/L at well CEF-011-01Sa in 1998). This historical exceedance has not been confirmed by the results of more recent samplings at the same location.

✓ The size of the vanadium plume, as defined by detected exceedances of the FDEP GCTL is relatively small (28,600 ft^2 and 1,605, 000 gallons) and this plume only extends to a maximum depth of 35 feet below ground surface (bgs).

✓ The soil that was the source of the groundwater vanadium contamination has been removed and the hydrogeological modeling performed as part of the FS predicts no significant further contaminant migration (i.e., approximately 5 feet in over 100 years).

- ✓ The FDEP GCTLs are based on a Hazard Quotient (HQ) value of 0.2 instead of the typically acceptable value of 1.0. This is done to account for the additive effects of ingesting contaminants from the soil. However, since at Site 45 the source of vanadium has been removed from the soil, the risk associated with groundwater should be considered as acceptable.

- ✓ The intended land use for the Site 45 area is industrial, which suggests that groundwater will not be used for residential purposes.

4.2 Lack of Vanadium Treatment Technology

This consideration can be substantiated by the attached technology evaluation memorandum. This memorandum may be summarized by the following points:

- ✓ A comprehensive survey of currently available technologies showed that only a zero-valent iron (ZVI) Permeable Reactive Barrier (PRB) had been successfully used for the in-situ removal of vanadium from groundwater. However, such an approach would not be practical at Site 45 because it depends on contaminant movement through the PRB and this would require excessive time.

- ✓ In-situ injection of a reductive chemical reagent, such as a sodium dithionite solution or a ZVI suspension, to create a reactive zone has been successfully used for the treatment of hexavalent chromium and might be successful as well for the treatment of vanadium at Site 45. However, this would have to be verified through treatability testing.

- ✓ Treatability testing for in-situ injection would be a relatively long and costly process that could involve the tentative cleanup of a significant portion of the entire vanadium contaminant plume. The cost of testing is relatively high compared to the risk reduction.

ATTACHMENT

Summary of Treatability Testing Options to Evaluate Technologies or the In-situ Treatment of Vanadium in Groundwater, Site 45 – Steam Generating Plant, NAS Cecil Field, Jacksonville, Florida