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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

MAY 26 1993

4WD-FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Linda Berry
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1822
Norfolk, Virginia 23511-6287

RE: Marine Corps Base Camp Lejeune NPL Site
HPIA Shallow Aquifer
Jacksonville, North Carolina

Dear Ms. Berry:

EPA has reviewed the document titled "Draft 90 Percent Design Submittal Basis of Design Report for the Shallow Aquifer at the Hadnot Point Industrial Area Operable Unit". Comments on the document are enclosed.

If you have any questions or comments, please call me at (404) 347-3016.

Sincerely,

Michelle M. Glenn

Michelle M. Glenn
Senior Project Manager

Enclosure

cc: Peter Burger, NCDEHNR
Neal Paul, MCB Camp Lejeune

COMMENTS
DRAFT 90% Design Submittal
Basis of Design Report

GENERAL COMMENTS

1. As stated in Baker's response to EPA's comments on the Draft 30 Percent Design Submittal, there is no apparent reason why the contaminant concentrations detected in groundwater samples collected in January 1991 were generally lower than the results from earlier sampling events.

   Therefore, it is important to demonstrate that the January 1991 data on which the treatment system design is based would conservatively represent the current level of contamination in the shallow groundwater aquifer.

2. Baker fails to include an operation and maintenance plan and a quality assurance project plan in the Prefinal Design.

   Draft specifications to be used by the construction contractor in preparing a site-specific health and safety plan should have also been developed and submitted with the Prefinal Design.

3. In general, the Prefinal Design is deficient in describing rationale and providing essential background data to support the design criteria selected. All assumptions made and equations and methodologies used in the design process should be specified and included in the Prefinal Design.

4. No significant modification on the recovery well spacing design approach has been made in the Prefinal Design as compared with the previous 30 Percent Design. Applying the Theis equation to the unconfined shallow groundwater aquifer is fundamentally incorrect and is likely to result in under- or overdesign of the groundwater extraction system. As it stands, the recovery well spacing configuration is arbitrary and technically unsound. Further discussion should be provided to confirm the adequacy of the well spacing design.

5. As proposed, the groundwater treatment system design can not demonstrate that the proposed treatment system effluent vinyl chloride concentration will meet the appropriate North Carolina water quality standards which are listed as site ARARS. Discussion on this apparent discrepancy is required.

6. A drawing showing the elevation, screen level and construction of the proposed recovery wells should be developed and submitted with the design drawings.

7. Problems were encountered while conducting the aquifer test at the 900 Building area (February 1993). The 72 hour test was conducted at a pumping rate of 1.5 gpm. This low pumping rate did not produce data that allowed representative hydraulic properties of the aquifer to be calculated.

   To prevent conducting an additional test, Baker Environmental provided aquifer test data that was collected at Site 22 by O'Brien and Gere Consultants. The tests were conducted on 2 recovery wells (6 inch diameter), with 5 observation wells (2 inch diameter). The recovery wells were pumped at 3 gpm for a duration of about 6 hours. Shortly after the test began (40 minutes), ground water flow reached steady state, indicating that the aquifer was not significantly stressed. In fact, it is likely that the drawdown observed during the test was depletion of well bore storage only. Based on the diameter of the recovery well (6 inches) and the saturated thickness (20 feet), approximately 100 gallons of water was stored in the well casing. Pumping the well at 3 gpm, it would take approximately 30 minutes to extract the water stored in the well casing which is approximately when ground water flow reached steady state during the test.

   It has been proposed that a ground water model will be used to design the remainder of the pump and treat system. Hydraulic properties that are representative of the surficial aquifer are critical for calibrating and performing sensitivity analysis on the model. Because inconclusive aquifer test data has been collected, a 72 hour test should be conducted at HPIA. The test may be conducted after the first group of extraction wells and treatment system have been installed. A step drawdown test should be conducted to calculate the optimum pumping rate for the constant rate test. Surrounding extraction wells should be monitored and possibly temporary piezometers should be installed and monitored during the test. Aquifer test data, time-drawdown curves, and transmissivity and storage calculations for the pumping and observation wells should be submitted for review.

8. Before any extraction wells are installed at HPIA, a grain size analysis should be conducted with sediments collected from the surficial aquifer. This information should be used to select the appropriate screen slot size for the extraction wells. Ideally, the slot size should permit 60 percent of the sediment to pass through the screen. The wells should be properly developed through overpumping and surging so that drilling fluids are removed and the compaction of the formation due to drilling is reduced. This will increase the permeability and effective porosity around the well bore. The wells should be constructed as outlined in the Standard Operating Procedures Manual.

9. Shallow well HPGW6 contained chromium (1560 ppb), lead (60 ppb), and nickel (161 ppb). This well should be included in the 1600 Building plume. An additional recovery well may be needed northwest of the line of wells proposed to contain contaminated ground water from this area.

SPECIFIC COMMENTS

PREFINAL DESIGN REPORT

1. Page 3-1, Paragraph 3, Section 3.0 - The paragraph states that "the results of the bench-scale and pilot-scale treatability tests will provide data to support the design of pretreatment components (e.g., metals removal, oil separation) and the air stripping treatment unit." Revise the paragraph to reflect the fact that treatability studies have been completed. Explain how the treatability study results have impacted the design process.

2. Page 3-1, Paragraph 6, Section 3.1 - Sampling data from monitor well HPGW 24-1 does not represent the maximum contamination conditions for the parameters investigated. Explain the rationale for selecting samples from HPGW 24-1 for the treatability study.

3. Page 3-3, Paragraph 1, Section 3.1.1 - Results of the oil and grease removal tests should be tabulated and presented.

4. Page 3-3, Paragraph 2, Section 3.1.2 - The statement that the metals of concern were primarily associated with suspended solids should be accompanied by supporting data. In addition, indicate whether the dissolved metal concentrations in the treatment effluent will meet discharge criteria.

5. Page 3-3, Paragraph 5, Section 3.1.2 - The text states that "Baker believes that the samples used for the bench-scale test are representative of actual site conditions at the HPIA." This statement is inconclusive and contradicts the preceding sentence which states that "metals concentrations in the raw sample used for the bench-scale test were less than many of the sampling results presented in Table 2-1." Furthermore, compared with the bench-scale test sample, the pilot-scale test samples had even lower metal concentrations reflected by lower total suspended solids concentrations (see Specific Comment No. 4). Therefore, the samples used in both the bench- and pilot-scale treatability tests are not indicative of the actual site conditions, and the intended purpose of treatability study for optimum design was not achieved.

6. Page 3-6, Paragraph 1, Section 3.1.2 - See Specific Comment No. 5.

7. Page 3-7, Paragraphs I and 2, Section 3.2.1 - The equations, rationale and assumptions used in calculating aquifer characteristics and recovery well spacing should be presented and explained As it appears, the aquifer characteristics calculations were conducted by assuming an aquifer of uniform saturated thickness; however, water table elevations in the shallow aquifer within HPIA vary significantly (see Section 2.3 of the Prefinal Design Report) . As stated in the General Comment No. 4, the Theis equation is not applicable to the unconfined shallow aquifer, and the well spacing data obtained by such method are arbitrary and technically unsound.

8. Page 4-1, Paragraph 2, Section 4.0 - The computing equation and procedures for the 95th percentile concentrations should be presented.

9. Page 4-2, Figure 4-1 - Include on this figure a schematic diagram showing how the backwash wastewater from sand filters and carbon absorbers will be disposed.

10. Page 4-6, Paragraph 1, Section 4-1 - Describe how a screen depth of 35 feet below land surface (bls) for the recovery wells was determined, and explain whether such installations are capable of capturing the vertical extent of the contaminated plume in the shallow aquifer.

Section 2.3 (Hydrology) of the Prefinal Design states that the first significant confining layer of the shallow aquifer occurs approximately 25 feet bls. This conflicts with the proposed recovery well screen depths since the design specifies that recovery wells will extract groundwater from the shallow, unconfined aquifer. Clarify this inconsistency.

11. Page 4-7, Paragraph 2, Section 4.2 - Indicate how the capacity of the sludge dewatering filter press was determined. Specify the operating conditions (pressure, final cake solids, etc.) of the filter press and disposal means of the dewatered sludge cake.

Monitoring requirements for the volatile organic compounds in the treatment effluent should be determined and discussed. Also specify how spent carbon in the carbon absorber will be disposed.

DESIGN DRAWINGS

12. Drawing C-2 - The backwash water lines from the liquid carbon units, as indicated on the drawing, are marked "To Drain," whereas the backwash wastewater in fact requires further treatment before it can be discharged (see Specific Comment No. 9). Revise the drawing to clarify this matter. Also, terms representing the same treatment unit such as "sand filter" and "multi-layer filter" should be used consistently in the drawing to avoid confusion.