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QUARTERLY BASEWIDE GROUNDWATER REPORT, VERIFICATION SAMPLING AND ANALYSIS, - SUMMER 2001, FOURTH QUARTER, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) CROWS LANDING FLIGHT FACILITY, STANISLAUS COUNTY

We have reviewed the *Quarterly Basewide Groundwater Report, Verification Sampling and Analysis, - Summer 2001, Fourth Quarter, NASA Crows Landing Flight Facility, Stanislaus County* (Report), received 10 December 2001. The Report provides groundwater monitoring data collected from selected basewide groundwater monitoring wells.

The Report includes groundwater data collected from Installation Restoration Program (IRP) Sites11 and 17, Underground Storage Tanks (USTs) Clusters 1 and 2, and USTs 109 and 117. The Administration Area plume includes the commingled petroleum and volatile organic compounds (VOCs) from UST Cluster 1, UST Site 117, and VOCs Site 17.

Groundwater was analyzed for the following constituents:

- VOCs (EPA Method 8260), including methyl-tert-butyl-ether and ethylene dibromide;
- Total Petroleum Hydrocarbons (TPH) as gasoline (-g), JP-4 jet fuel (-j), diesel (-d) and motor oil (-mo) by EPA Method 8015B;
- seventeen California Assessment Manual (CAM-17) metals (EPA Method 6010B/7000 series), and
- hexavalent chromium (EPA Method 7196).

Additional analyses conducted include alkalinity, chloride, nitrate, nitrite, sulfate, phosphate, and total dissolved solids.

Five new monitoring wells were installed along Bell Road, on the eastern side of the groundwater plume. Groundwater analysis, for VOCs-only at the new wells, reported acetone (95 µg/L estimated), benzene (10.9 µg/L), bromochloromethane (1.8 µg/L), bromoform (4.9 µg/L), dibromochloromethane (4 µg/L), and chloroform (1.0 µg/L).

The Report concludes that the results are similar to the first, second and third quarterly rounds of groundwater sampling and analyses. The highest concentrations reported for groundwater analysis of the

Administration Area plume were TPH-g (166,000 µg/L), TPH-d (390 µg/L), TPH-mo (220 µg/L), benzene (17,200 µg/L), carbon tetrachloride (123 µg/L), chloroform (17 µg/L), 1,2-dichloroethane (470 µg/L), antimony (4.9 µg/L), arsenic (5.4 µg/L), chromium (total, 72.7 µg/L), hexavalent chromium (38 µg/L), lead (5.0 µg/L estimated), mercury (0.73 µg/L), nickel (16.6 µg/L), and selenium (58.7 µg/L).

Specific Comments

1. Section 2.2.4 Supplemental Information, Field Observations, page2-3: The text states that monitoring well 17-MW-15 appears to be impacted by bentonite grout, due to high pH (11.14 to 11.18) and visual evidence. Section 4.0 Monitoring Plan and Recommendations does not provide a recommendation to rehabilitate or replace 17-MW-15. Please provide a recommendation for rehabilitation or replacement of 17-MW-15.

2. Section 3.1.2 Basewide Water Level Monitoring Results, page 3-1. The text states that the datalogger hydrographs presented in Appendix C show that monitoring well BG-MW-01 is influenced by pumping at irrigation well 6/8-20(NALF) at a distance of 900 feet. Another Appendix C datalogger hydrograph also shows an apparent influence from pumping wells, as smaller peaks at monitoring well CL2-MP-03 B. CL2-MP-03 B is located approximately 800 to 1200 feet from three different irrigation wells (6S/8E-9M1, 6S/8E-9M2, and one well listed as "new" in the Figure of Estimated Locations of Water Supply Wells, from *Draft Findings from Record Search Activities and Visual Inspections of Active and Inactive or Destroyed Water Supply Wells, Former NALF Crows Landing*, dated 31 December 2001). Please evaluate whether the peaks shown on the CL2-MP-03 B datalogger hydrograph are the result of pumping irrigation wells, and identify which irrigation well(s) may have influenced the water levels at CL2-MP-03 B. Provide a detailed description, including distance to the pumping well, of this analysis in the next groundwater monitoring report. This data is helpful for determining the radius of influence of pumping irrigation wells, and will be useful when designing a remedial alternative that includes hydraulic containment of the groundwater plume.

3. Section 3.3.4 Method Blanks and Trip Blanks, page 3-5: The text states that three (3) Method Blanks and associated groundwater samples contained gasoline components. Method blanks were also contaminated with VOCs and metals. Consequently, all groundwater samples with less than 5 times the concentration detected in the Method Blank were reported as non-detect. Please evaluate sampling and analysis protocols to eliminate contamination.

4. The Appendix B laboratory data sheets show that trip blanks from sample delivery groups (SDG) 01-5241, and SDG 01-5285 contained gasoline (20 µg/L estimated). Please revise the text in Section 3.3.4 Method Blanks and Trip Blanks, TPH as gasoline (EPA Method 8015B), page 3-5, to include the contaminated trip blanks.

5. Section 4.0 Monitoring Plan and Recommendations, page 4-1: The text states that 4 wells were added to the monitoring program, while 4 wells were removed. A table in the text gives the well numbers and the rationale for removing 1 of the 4 wells. a). Please revise the table to give the rationale for removing the other 3 wells from the monitoring program. b). In the future, please provide the rationale(s) for changing the monitoring plan wells to the BRAC Cleanup Team (BCT) for regulatory agency concurrence, prior to modifying the monitoring program.

If you have any questions please contact me at (916) 255-3050 or bartonj@rb5s.swrcb.ca.gov.

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