Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
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Governor

M60050.002560
MCAS EL TORO
SSIC #5090.3

October 3, 2001

Mr. Dean Gould
BRAC Environmental Coordinator
Marine Corps Air Station El Toro
Base Realignment and Closure
P.O. Box 51718
Irvine, California 92619-1718

DRAFT WORK PLAN, AQUIFER TEST, INSTALLATION RESTORATION PROGRAM SITE 2, MAGAZINE ROAD LANDFILL, MARINE CORPS AIR STATION (MCAS) EL TORO

Dear Mr. Gould:

The Department of Toxic Substances Control (DTSC) reviewed the referenced Work Plan dated August 2001 that was received by this office on September 4, 2001. The Work Plan details the objectives and procedures to characterize aquifer properties, extent of volatile organic compounds (VOCs) in groundwater, and natural attenuation properties of groundwater.

After review of the document, DTSC has the following general comments:

1. The nature and extent of contaminants in groundwater should be characterized and submitted for review prior to initiating aquifer testing. When evaluating the nature and extent of contamination, please provide information regarding the potential sources of contamination.

2. Please clearly identify and evaluate the existing hydrogeologic information obtained during the Remedial Investigation (Refer to Section 1.4.4) and explain how the results of new testing will supplement or modify the existing information. For the proposed aquifer testing, pumping from six wells over a total pumping duration of six months is proposed. Please provide additional justification for the substantial pumping that is proposed.

received
10/1/01

In addition to the comments provided above, please address the enclosed comments prepared by the DTSC Geologic Services Unit. If you have any questions, please contact me at (714) 484-5395.

Sincerely,

Triss M. Chesney, P.E.
Remedial Project Manager
Southern California Branch
Office of Military Facilities

Enclosure

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MEMORANDUM

TO: Triss Chesney
Hazardous Substances Engineer
Office of Military Facilities

FROM: Frank Gonzales, C.Hg.
Hazardous Substances Engineering Geologist
Geological Services Unit

REVIEWED BY: Theodore R. Johnson, C.E.G., CHg.
Senior Hazardous Substances Engineering Geologist
Geological Services Unit

DATE: October 1, 2001

SUBJECT: DRAFT WORKPLAN AQUIFER TEST, IRP SITE 2, MAGAZINE ROAD LANDFILL, MARINE CORPS AIR STATION, EL TORO, CALIFORNIA

PCA: 20017059 SITE: 400055-47 REQUEST:20017059

INTRODUCTION

As requested, the Cypress Geological Services Unit (GSU) staff of the Department of Toxic Substances Control (DTSC), Site Mitigation Program reviewed the *Draft Workplan, Aquifer Test, IRP Site 2, Magazine Road Landfill, Marine Corps Air Station, El Toro, California (the Plan)*, dated August 2001. The Plan was prepared by Earth Tech, Inc.

This memorandum contains general and specific comments and recommendations (in bold) on the Plan. All comments should be addressed before finalizing or implementing the Plan.

BACKGROUND

Site 2 was a landfill in the eastern portion of the El Toro Marine Corps Air Station. The landfill was used from the 1950s until about 1980. Suspected wastes disposed of in the landfill included: construction debris, municipal waste,

batteries, waste oil, hydraulic fluid, paint residue, transformers, and waste solvents.

Groundwater encountered at Site 2 occurs in the alluvium and bedrock. Hydrogeologic conditions are heterogeneous and range from unconfined to confined conditions.

Volatile organic compounds (VOCs) were confirmed in two plume areas downgradient from Site 2. In both, VOC concentration exceeded the Maximum Contaminant Levels (MCLs). Further investigation is proposed in the Plan to define the complete lateral and vertical extent of contamination.

Previous investigations generated preliminary data on aquifer properties. Hydraulic conductivity values were calculated from slug tests and aquifer tests. Additional data on aquifer properties and evaluating the feasibility of long-term groundwater extraction are proposed in the Plan.

GENERAL COMMENTS

1. The proposed groundwater characterization will aid in delineating groundwater contamination. However, subsequent fieldwork is best described as feasibility testing to aid in screening and selecting remedial alternatives for groundwater extraction. Therefore, due to the nature of the proposed work, subsequent aquifer testing and long-term pumping should not be undertaken until all parties agree that all known contaminants and the extent of groundwater contamination are determined.

2. It is unclear how the previous information collected on the aquifer hydraulic properties were incorporated. During the Remedial Investigation (RI), aquifer tests were performed at three of the six proposed extraction wells. This fact was mentioned in the Plan (Section 1.4.4), but detailed analysis of the significance of the aquifer characterization was not provided. Therefore, it is unclear if the proposed testing will serve to validate existing hydrogeologic information or modify the conceptual hydrogeologic model for the site.

3. Based on the previous aquifer test data, the feasibility of sustained pumping at several proposed wells may be a limited. For example, the Plan (Table 3-4) describes the sequence for incorporating additional wells into the test. It appears that all these wells are screened in a confined bedrock unit that is laterally heterogenous containing low permeability zones. This was documented in the RI, where pumping rates could not be increased during step drawdown testing at monitoring well 02DGMW60. The testing of low-permeability zones within this unit may overlook areas of the aquifer with higher permeability, which allow for increased groundwater flow and potentially greater migration of contaminants.

Since wells will be brought on-line during the test, it is imperative that the first wells tested in each plume be the most efficient, highest yielding wells for collecting the best data possible. Therefore, the sequence for aquifer testing at each plume is critical and should consider previous data collected during the RI for targeting wells screened in the most permeable zones. See Specific Comments 3 and 5 for details on establishing pumping rates and sequencing wells.

SPECIFIC COMMENTS

1. Page 1-11, Figure 1-4, Groundwater Elevation Contours. This figure appears to combine water levels for wells screened in both unconfined and confined aquifers. For example, during the RI at Site 2, two aquifer systems were described with varying groundwater flow directions and gradients (see Section 3.0 of the RI, 1997).

   The contractor should indicate whether this figure represents hydrogeologic conditions in the alluvium or bedrock. In addition, the contractor should provide groundwater contour maps for both the unconfined and confined aquifers. Any conflicts with the final RI should be discussed and adequately justified.

2. Page 2-1, 2.2 Project Decision Questions. A key question not yet resolved is the total extent of VOCs in groundwater at Site 2. The extent of groundwater contamination must be completely defined before initiating an extended period of ground water extraction for the following reasons: long-term pumping would affect aquifer flow characteristics and pumping may alter the distribution of contaminants in groundwater.

   The contractor should submit the results of the groundwater investigation prior to initiating long-term aquifer testing. This submittal should consist of the proposed hydropunch sampling, evaluation of natural attenuation, and any other groundwater data results.

3. Page 3-7, 3.1.3 Aquifer Test. The Plan indicates the pumping rate for each well will be one gallon per minute; however, no rationale was provided selecting this rate. The aquifer test should stress the aquifer for obtaining the most accurate data to represent the hydrogeologic properties of the aquifer. This will require performing the test at a pumping rate that balances the pumping and ability of the well to recharge.

   The contractor should include a step drawdown test using at least three successive higher pumping rates. The step drawdown test should be

performed before starting the aquifer test to establish the optimum pumping rate.

4. Page 3-7, 3.1.3 Aquifer Test, last paragraph. The last sentence in this paragraph contains a typographical error, where it states "... pumping and observation wells are list in .... "

5. Page 3-7, 3.1.3 Aquifer Test. The Plan indicates the aquifer test will be phased-in over a six-month period. The first well within each plume will be pumped for one month before adding subsequent pumping wells over the next five months. Under this scenario, the first month of the aquifer test is the most critical because it will likely generate the highest quality data for estimating hydraulic conductivity, aquifer transmissivity, and storativity. The long-term sustainability of groundwater extraction can then be evaluated as other wells are added.

   The contractor should reevaluate the pumping order of wells in the TCE plume. Pumping should begin using monitoring well 02NEW17 if this well is screened in a unit with higher permeability than well 02DGMW60.

6. Page 3-11, 3.2.5 Aquifer Test. All water level transducers used on the project should be calibrated prior to aquifer testing to ensure proper measurements of water levels. Instrument calibration is routinely performed and described as part of the project quality assurance/quality control (QA/QC).

   The contractor should add the calibration of transducers to the project QA/QC plan.

7. Page 3-12, 3.2.6 Groundwater Sampling. The compound 1,4-dioxane is becoming more prevalent at sites throughout California, where chlorinated solvents are a problem in groundwater. This compound is used as a stabilizer in the manufacture of chlorinated solvents and is highly water soluble. Its high water solubility causes it to migrate more rapidly in groundwater than other compounds in a chlorinated solvent mixture.

   The contractor should include the analysis of 1,4-dioxane in groundwater samples. Detection limits should be appropriate for meeting the California Action Level of 3 micrograms/liter.

8. Page 5-1, 5.4 Aquifer Test. The Plan indicates that aquifer testing will be used to assess the effectiveness of the remedial alternatives. This evaluation should begin early on in the process for generating high quality data as the end product.

The contractor should begin plotting drawdown data generated in the first month while the first pumping well is online. This data should be used in analyzing the aquifer test and may also be helpful for indicating how much longer the test should continue.

9. Table A-1. The detection of perchlorate was not sufficiently explained in the background of the Plan. Perchlorate was detected in monitoring wells 02DGMW61 and 02NEW08A. However, the Plan did not include sampling for perchlorate at additional wells, hydropunch locations, or during the aquifer testing.

The contractor should include the analysis of perchlorate in the Plan.

If you have any questions, please contact Frank Gonzales at 714-484-5410.

Cc: Celsa Sanchez (2)