Department of Toxic Substances Control

Terry Tamminen
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Edwin F. Lowry, Director
5796 Corporate Avenue
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Arnold Schwarzenegger
Governor

May 14, 2004

Mr. F. Andrew Piszkin
BRAC Environmental Coordinator
Base Realignment and Closure
Marine Corps Air Station El Toro
7040 Trabuco Road
Irvine, California 92618

COMMENTS ON SITE ASSESSMENT REPORT FOR IRP SITE 16, CRASH CREW PIT NUMBER 2, FORMER MARINE CORPS AIR STATION EL TORO

Dear Mr. Piszkin:

The Department of Toxic Substances has reviewed the subject document dated March 30, 2004, prepared by Shaw Environmental, Inc. The report describes investigation including soil borings, soil matrix sampling and analysis, and vadose zone modeling at IRP Site 16, Crash Crew Pit Number 2. A total of 79 soil samples were analyzed for total petroleum as gasoline (TPH-g), TPH as diesel (TPH-d), and volatile organic compounds (VOCs). TPH-g and TPH-d contamination was documented to about 110 feet below ground surface (bgs) in 2 borings. Also, VOCs were detected in soils below and in the vicinity of the former main pit extended at 130 feet bgs. The depth to groundwater in the vicinity of Site 16 is estimated to be approximately 160 bgs. The report recommends soil vapor extraction (SVE) to remove the TPH contaminant mass in the soil and further reduce impacts to groundwater. In addition, the report recommends additional testing to be conducted in order to determine radius of influence and other design parameters before construction is implemented. The contract for cleanup of the soil is planned for award before the end of FY 04.

DTSC concurs with the proposed SVE remedy for the site; however, the SVE should not be limited to the contaminant mass between 20 and 100 feet bgs. Please note that TCE has transited the entire vadose zone, reaching groundwater. The soils between 110 and 160 feet bgs almost certainly contain residual TCE and should also be subject to SVE remediation. This will help protect groundwater from further degradation, and will probably greatly enhance the monitored natural attenuation groundwater remedy

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proposed for the site. For additional comments on the document, please see the enclosed comments prepared by Mr. Dave Murchison, from our Geological Services Unit.

If you have any questions, please contact me at (714) 484-5419.

Sincerely,

Tayseer Mahmoud
Senior Hazardous Substances Engineer
Office of Military Facilities
Southern California Branch

Enclosure

cc: Ms. Nicole Moutoux
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MEMORANDUM

TO: Tayseer Mahmoud
Project Manager
Office of Military Facilities

FROM: Dave Murchison, R.G.
Engineering Geologist
Cypress Geological Services Unit

CONCUR: Scott Warren, C. E. G., C. Hg.
Senior Engineering Geologist
Cypress Geological Services Unit

DATE: May 14, 2004

SUBJECT: Draft Geologic/Hydrogeologic Review of
Site Assessment Report, IRP Site 16,
Former Marine Corps Air Station
El Toro, California, by Shaw Environmental Inc.,
Dated 31 March, 2004

PCA: 18040 Site Code: 400055-18 Request No. 20037192

As requested, Site Mitigation and Brownfields Reuse Program, Geological Services Unit (GSU) staff performed a review of the *Site Assessment Report, IRP Site 16, Former Marine Corps Air Station El Toro, California*, dated 30 March 2004 by Shaw Environmental, Inc. (Report), described above. The Report describes the investigation including soil borings, soil matrix sampling and analysis, and vadose zone modeling at IRP Site 16, at the former Marine Corps Air Station (MCAS) El Toro.

The Report was reviewed for internal consistency and for conformance with DTSC and US EPA guidance for remedial investigation and vadose zone evaluation. Specific comments regarding details of the Report follow. Questions regarding the memorandum should be directed to Dave Murchison at (714) 484-5484.

Introduction

IRP Site 16 is located near the center of the former airfield at MCAS El Toro (Base), and was known as Crash Crew Training Pit No. 2 while in service. The facility included three unlined pits known as the main pit, residual fluids pit, and hand-held extinguisher pit. The main pit remains open at the site, and is roughly 170 feet in diameter and 3 feet deep. The site was in use from about 1972 to 1985 as a training area for firefighters. The main pit was reportedly filled with water, and covered with flammable liquids such as mixtures of residual fuels including jet fuel, gasoline, crankcase oil and other waste. The fuel was then ignited and extinguished by firefighters. Excess water passed through a buried pipe to the residual fluids pit. The area was also drained by a swale that led to a nearby storm drain inlet near the intersection of El Toro Boulevard and Runway 21. The storm drain reportedly discharges into Bee Canyon Wash.

The site geology is dominated by alluvium derived from the Santa Ana Mountains. Groundwater occurs at about 160 feet below ground surface in relatively fine-grained soils, and flows to the northwest.

Previous investigations have documented the presence of petroleum hydrocarbons and volatile organic compounds (VOCs) in soil at the site. A VOC plume has been documented in groundwater. The main VOC of concern is trichloroethene (TCE), although chloroform, 1,2-dichloroethane (DCA), and methylene chloride have also been detected. Tertiary butyl alcohol (TBA) has been detected in soil at the site.

Current Investigation

The Report describes the following activities:

1. Background research, site reconnaissance, and other preparations.
2. Drilling and sampling of 18 hollow stem auger borings including 12 shallow and 6 deeper borings. Soil matrix samples were collected at 5 and 10 feet below ground surface (bgs) in the shallow borings, and at 10-foot vertical intervals from 20 feet bgs to total depth in the deep borings. The deepest soil matrix samples were taken at 140 feet bgs.
3. Soil matrix samples were analyzed for total purgeable petroleum hydrocarbons as gasoline (TPH-g) and total extractable petroleum hydrocarbons as Diesel (TPH-d) by the California LUFT method (US EPA Method 8015 modified). In addition, most soil samples were also analyzed for VOCs by EPA Method 8260b. Some samples were analyzed for total organic carbon by the Walkley-Black method, and geotechnical parameters.
4. The boring locations were surveyed by a registered land surveyor.
5. Vadose zone modeling was performed using the VLEACH computational model.

Findings

Geology of the site is characterized by laterally discontinuous sands, silts, and scattered clay layers. The individual units are typically thin, less than10 feet thick, and on cursory inspection the units do not appear to correlate between borings.

TPH-g and TPH-d contamination was documented to about 110 feet bgs in 2 borings. Concentrations of TPH-d range up to 40,000 mg/kg, with the highest concentrations in the top 60 feet of the soil column. TPH-d was found at 4,800 mg/kg in soils at 110 feet bgs, and non-detect in samples taken at 120 to 140 feet bgs, the maximum depth of investigation. TPH-g was detected in a similar volume of soil, with maximum concentrations of about 8,300 mg/kg, and 5,100 mg/kg at 110 feet bgs. TPH-g was not detected in the samples taken deeper than 110 feet bgs.

TCE was detected in soils below and in the vicinity of the former main pit. The maximum concentration was reportedly 2,700 µg/kg and detectable TCE extended to 130 feet bgs in boring CB-11, where 22 µg/kg was detected in a soil matrix sample. For comparison, the residential PRG for TCE is 53 µg/kg, and the industrial PRG is 110 µg/kg (US EPA Region IX, 2002; http://www.epa.gov/region09/waste/sfund/prg/files/02table.pdf).

Other VOCs that extend to considerable depth at the site include various isomers of trimethylbenzene, benzene, ethylbenzene, toluene, xylenes, tertiary butyl alcohol, acetone, 2-butanone, 2-hexanone, 4-methyl-2-pentanone, isopropylbenzene, n-and sec- butylbenzene, n-propylbenzene, naphthalene, and p-isopropyltoluene. None of these was reported at concentrations greater than residential PRGs.

The Report includes vadose zone modeling using the VLEACH computational model. Since the VLEACH model is designed for single chemicals, rather than complex mixtures like TPH, the model was run for ten surrogate compounds known to be associated with, or components of, TPH. The

General Comments

1. GSU has some concern that the amount of data available to the Contractor was sufficient to run a valid VLEACH model. The data does not rule out TPH or VOC contamination in soil extending all the way to groundwater, since the number of deep borings is limited. VOC contamination has reached groundwater, and so the modeling is of limited value in planning remediation. In addition, the VLEACH model is based on a precipitation-driven infiltration model, which may not be well suited to the dry Mediterranean climate of El Toro. Since the conclusions and recommendations of the Report indicate further action will be taken with respect to soil, GSU regards this comment as informational, and does not request changes to the Report on this basis.
2. GSU concurs that soil vapor extraction (SVE) is probably a suitable remedial alternative for this site.

3. GSU does not concur that SVE should be limited to the contaminant mass between 20 and 100 feet bgs. GSU notes that TCE has transited the entire vadose zone, reaching groundwater. The soils between 110 and 160 feet bgs almost certainly contain residual TCE and should also be subject to SVE remediation. This will help protect groundwater from further degradation, and will probably greatly enhance the monitored natural attenuation groundwater remedy proposed in other submittals.

Specific Comment

4. Figures 6 and 7, Cross sections A-A' and B-B'. There is an apparent error in the depth scales on these figures. The deepest depth should probably be 140' rather than 40'.