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From: Commander, Western Division, Naval Facilities Engineering Command
To: Distribution

Subj: FINAL SUMMARY REPORT OF UST REMOVALS (JULY THROUGH OCTOBER
1991) NOVEMBER 18, 1992, NAVAL STATION TREASURE ISLAND, HUNTERS
POINT ANNEX

Encl: (1) Response to EPA's Comments on the Final Summary Report of UST Removal
(July through October 1991), dated January 6, 1993

1. The U.S. Navy's response to the U.S. Environmental Protection Agency's comments dated
December 18, 1992 on the subject report is forwarded as enclosure (1).

2. If you have any further questions regarding this matter, please contact Mr. William
Radzevich, Code 1811WR of this Command at (415) 244-2555.

Original signed by:

LOUISE T. LEW
By direction

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January 6, 1993

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CLEAN Contract No. N62474-88-D-5086
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Re: Response to EPA's Comment on the Final Summary Report of UST Removals (July through October 1991)

Dear Mr. Radzevich:

This letter is in response to the U.S. Environmental Protection Agency's reviewer's (Bechtel) comment on the Final Summary Report of UST Removals (July through October 1991) dated December 16, 1992.

Comment: In response to Comment 2, the Navy has prepared Table 20 summarizing the comparison of DTSC and Navy sampling and analyses results. The implications of the large relative percent difference between DTSC and Navy determined concentrations should be described in the discussion of Table 20.

Response: The high relative percent differences (RPD) between the PRC Environmental Management, Inc.'s (Navy) and DTSC's split samples may have been caused by one or more of the following:

- Non-comparable analytical methods
- Unusually high detection limits in the DTSC samples
- Poor agreement between volatile and total petroleum hydrocarbons (TPH) gasoline results in the DTSC samples
- Poor agreement between semivolatile and TPH diesel results in the DTSC samples
- Questionable ethylene dibromide (EDB) results in the DTSC samples

The DTSC laboratories used different analytical methods than the PRC laboratory. For example, the DTSC laboratory reported using SW-846 methods for the analysis of volatiles, semivolatiles, pesticides/polychlorinated biphenyls, and metals, while the PRC laboratory performed the analyses using EPA's contract laboratory program (CLP) methodology. In general, these

methods should be comparable, but small differences in the stated methodologies could contribute to the poor precision. For the TPH analyses, the DTSC laboratory reported using Southern California Laboratory (SCL) Method 815 for the analysis of TPH gasoline and TPH diesel. This method may be a variation on the method described in the California Leaking Underground Fuel Tank (CA LUFT) guidelines.

A major difference between the methods might be the procedure for quantitation of hydrocarbons. If a sample contains both gasoline and diesel, or a weathered fuel mixture it is often difficult to identify exactly what type of fuel is present. When quantitating such unknown fuel mixtures some laboratories quantitate all hydrocarbons present in the sample, while other laboratories quantitate those hydrocarbons with a specific number of carbon atoms. The differences in the quantitation methods may have also contributed to PRC's higher concentrations for TPH diesel. In fact, the PRC laboratory noted on certain samples that lighter hydrocarbons not suspected to be diesel were quantitated as diesel.

Second, the TPH analytical methods used by PRC and DTSC laboratories do not appear to be comparable because of the differences in detection limits obtained by the laboratories. The table below shows the PRC laboratory was able to achieve the detection limits established in the CA LUFT guideline for all matrixes. However, the DTSC laboratory had trouble reaching the detection limits for all analyses except TPH gasoline in water and occasionally in soil. In addition, the DTSC laboratory reported a wide range of detection limits for the TPH analyses and did not provide any explanation for this analytical problem.

Comparison of TPH Detection Limits

<u>Analyte/Matrix</u>	<u>CA LUFT-required Detection Limits</u>	<u>PRC Laboratory Detection Limits</u>	<u>DTSC Laboratory Detection Limits</u>
TPH Gasoline			
Soil	10 mg/kg	5-6 mg/kg	10-200 mg/kg
Water	0.5 mg/L	0.5 mg/L	0.7-0.8 mg/L
TPH Diesel			
Soil	10 mg/kg	10-12 mg/kg	50-200 mg/kg
Water	0.5 mg/L	0.5 mg/L	45-100 mg/L

The reason that the DTSC laboratory was not able to reach the appropriate detection limits is unclear; however, some possible explanations include (1) poor instrument sensitivity, (2) unnecessary dilution of sample before analysis, (3) use of inappropriately small sample size. Any of these problems would lead to high variability in the analytical results and the results would not compare well with the sample results analyzed according to the CA LUFT method.

The third possible reason for poor reproducibility between the PRC and DTSC samples is the poor agreement of the aromatic volatile and TPH gasoline results. When a volatile analysis is performed on a gasoline sample, benzene, toluene, ethylbenzene, and xylenes (BTEX) are usually detected as well in some combination depending how weathered the gasoline or fuel mixture is. The measurement of the TPH gasoline includes all hydrocarbons up to approximately 12 carbons in length. This includes the BTEX analytes that contain six to eight carbons. Therefore, the gasoline concentration in all samples should be higher than the added concentrations of the BTEX analytes. However, some of the DTSC split samples do not agree on this point.

For example, in sample 304/305-GW, the total concentration for the BTEX analytes in the DTSC result for this sample is 18.9 milligrams per liter (mg/L), while the result for TPH gasoline is only 9.3 mg/L. The PRC results for this same sample are 22.5 mg/L and 27.5 mg/L for total BTEX and TPH gasoline, respectively, which is much more reasonable. The same is true for sample 001-004-GW where the DTSC result for total BTEX concentration is 1.192 mg/L while the TPH gasoline concentration is 0.7 mg/L. The DTSC results for volatiles and TPH gasoline in these samples do not reflect the relationship of BTEX as a constituent of gasoline.

In a similar manner, the fourth reason is that naphthalene, 2-methylnaphthalene, and heavier semivolatile organic compounds are indicators of the presence of diesel. However, in numerous samples the DTSC laboratory detected these analytes but not diesel. The PRC laboratory results show much better agreement between the semivolatile and TPH diesel results.

For example, in sample 215-S5 PRC detected pyrene, benzo(a)anthracene, chrysene, and benzo(b)fluoranthene at concentrations of 0.41-5.5 milligrams per kilogram (mg/kg) and TPH diesel at 1200 mg/kg. The DTSC results for this sample detected naphthalene, 2-methylnaphthalene at 49 and 40 mg/kg, respectively, and the diesel result was nondetected with a detection limit of 45 mg/kg. These DTSC results do not agree.

Fifth, the EDB results in three of the DTSC samples are questionable. In these samples EDB was the only analyte detected. EDB is a gasoline additive and would normally only be found in conjunction with gasoline contamination. However, in samples 813-S2, 813-PP1, and 003-PP1 no gasoline or BTEX was detected by either the PRC or DTSC laboratories, and only EDB was detected by the DTSC laboratory. It seems unlikely that this result is correct and calls into question the other EDB results presented by DTSC.

Mr. William Radzevich
Page 4

Overall, the analytical results reported by the PRC laboratory are more consistent and of better quality than the results submitted by the DTSC laboratories. This can be seen in the better agreement between the volatile and TPH gasoline results, the semivolatile and TPH diesel results, and the EDB and gasoline results. The detection limits achieved by the PRC laboratory also indicate stricter adherence to the method and better quality results for the TPH gasoline and TPH diesel analyses.

If you have any questions or need further information, please call me at (415) 543-4880.

Sincerely,



Scott Wald
Project Manager

cc: File