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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

February 14, 1992

Ms. Adrienne P. Townsel
Restoration Project Manager
U.S. Department of the Navy
Northern Division - NAVFAC
Building 77L, U.S. Naval Base
Philadelphia, PA 19112

Dear Ms. Townsel:

Thank you for the opportunity to review the "Plan of Action - Pier 33 and Berth 16 - IR Study - Naval Submarine Base New London, Groton, Connecticut." EPA offers the following comments and recommendations with regard to this document:

GENERAL COMMENTS

- The Plan of Action should present a plan for reviewing all historical documentation pertaining to these sites, including results of previous site investigations, aerial photographs, interviews with base personnel, and base records. Results of this review should be incorporated into this work plan. This should include summaries of analytical results, a description of soils found in the borings previously drilled near Pier 33 and Berth 16, information on the site specific geology of these two sites, a map showing the depth of bedrock, and information on volumetric leak tests performed on the underground storage tanks at these two sites.

- The approximate (conceptual) direction of ground water flow in the areas of Pier 33 and Berth 16 should be shown on the figures in the report.

- The direction of surface runoff and location of storm drains should also be indicated on these figures.

- There is no indication in the plan that any sediment sampling will take place during this investigation. In light of the fact that these two sites are adjacent to the Thames River and sediment contamination is a real possibility, sediment samples should be collected. These samples should be taken upstream, downstream, and adjacent to the site. In addition to TCL, TAL and TPH analysis, TOC and grain size should also be performed on these samples.

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- In addition, surface water bodies and sediments in storm drains that receive surface runoff from these two sites should be sampled. The very fine-grained sediments that accumulate in storm drains could be repositories for PCBs, particularly in the area of Building 173.

- The soil gas survey procedure should be modified to state that the survey will not be conducted if the ground appears saturated, i.e., standing pools of water on the ground surface.

- In reference to the need for RCRA and CTDEP characterization requirements of soils for disposal, only TCLP metals are discussed in the work plan. The other aspects of characterization for disposal must also be evaluated. These include, corrosivity, ignitability, and TCLP volatile and semivolatile constituents.

SPECIFIC COMMENTS

- Page 3, First ¶ - This section should include a discussion on the scope and results of previous sampling and investigative efforts at these two sites. For example, analytical data for the borings shown on the site maps and geologic information (as well as geologic information from adjacent sites) should be reviewed and presented to support the activities proposed in this field investigation.

- Page 3, Fifth ¶ - The area of stained soil, mentioned in the text, should be indicated on the site map.

- Page 7, Fifth ¶ - The text states that personnel decontamination will be accomplished at the site trailer. It is not appropriate to decontaminate personnel at this location unless the trailer is adjacent to the work site. Decontamination should be performed at the boundary of the exclusion zone at the work site.

- Page 11, First ¶ - The soil gas grids should be expanded beyond the outlines shown on Figures 4-1 and 4-2 until a limit of contamination is detected.

- Page 13, First ¶ - The text states that wells will be screened across the water table. The text should also indicate that the character of the soil will be considered in the placement of well screens, to ensure that screens are not installed across confining layers (if they exist).

- Page 13, Second ¶ - Monitoring wells should be tested for hydraulic conductivity utilizing pump or slug testing. This is especially important given that the hydraulic conductivity testing previously performed was not properly executed. It is important to obtain accurate hydraulic conductivity data to assess the integrity of the monitoring well and to evaluate the subsurface conditions. Estimation of hydraulic conductivity from gain size distribution is only reliable to several orders of magnitude.

- Page 13, Third ¶ - This paragraph states that only drill cuttings with visual contamination or with volatile organic readings above 10 ppm (monitored by an HNu or OVA) will be containerized. Since these screening instruments detect only VOCs, all drill cuttings should be containerized. The final decision on disposal should be based on final laboratory results from the applicable soil boring samples and/or a composite sample from each barrel of drill cuttings.

- Page 14, Third ¶ - The text should clarify whether soil gas samples will be taken from beneath the site buildings. If not, the soil gas grid should be extended to the east. In addition, the soil gas methodology should be modified to ensure that the soil gas survey will be extended to adequately characterize any "hot spots" observed. The soil gas survey should not take place for 24-48 hours after a significant precipitation event (more than .2 inches).

- Page 14, Fourth ¶ - A soil boring should be advanced in the area of the stained soils (as observed during Atlantic's site visit).

- Page 14, Sixth ¶ - A high lamp energy bulb (11.8 eV) PID should be used to screen the soil samples. There may be compounds that cannot be detected with a lower energy lamp.

  The rationale behind the selection of samples for analyses eliminates any inorganics criteria except for the default sample at the water table. Since the nature and extent of contamination is unknown, samples should be taken at specified depths and analyzed for parameters.

- Page 17 - Table 4-4

  The indication that ground water samples are to be analyzed for TCLP metals is not consistent with Table 4-3 rationale. Please explain.

At least one of the three borings/monitoring wells proposed for advancement through the acid trench (19TB4, 19MW2 or 19MW4, as shown on Figure 4-1) should be drilled and sampled to bedrock. If sulfuric acid contamination is detected in the deeper interval in one of these soil borings, the boring should be advanced to bedrock or confining layer since the specific gravity of sulfuric acid is 1.84 (possible DNAPL).

It is uncertain from the discussion presented how "high ground water elevation" will be determined relative to well screen placement.

- Page 18, Third ¶ - Please clarify the reference to the TCLP sampling of ground water.

- Page 18, Fifth ¶ - As previously discussed, samples should be obtained from within the storm drain system.

- Page 18, Tenth ¶ - Samples should also be obtained from former source areas (the dumpster washing area, the incinerator, any loading docks, etc.). In addition, the soil gas survey should be expanded to encompass these former suspected source areas.

- Page 19 - Figure 4-2 - Monitoring well 20MW1 has been designated as the "background" reference well. This location may not be truly representative of "background" conditions due to the fact that it is located downgradient of an active railroad bed. This sampling location should be chosen during a site visit prior to the commencement of field activities.

- Page 20 - Table 4-5 - The indication that ground water samples are to be analyzed for TCLP metals is not consistent with Table 4-3 rationale. Please explain.

- Page 21, Third ¶ - The rationale behind the selection of samples for analyses eliminates any inorganics criteria except for the default sample at the water table. Since the nature and extent of contamination at these sites is unknown, samples should be taken at specified depths and analyzed for all parameters.

<u>APPENDIX B</u>

- No. 1020, Page Three - The last sentence on this page supports the rationale for sampling in the storm drains by stating that selection of sampling locations may be in "areas where water may have ponded during storm events".

- No. 1023, Page Seven - Samples taken for volatile analysis should not be collected with a peristaltic pump as stated as an option in No. 3. They should only be collected with a bailer. In addition, prior to each sampling event, each well should be inspected for the presence of free product.

  A minimum of two weeks must elapse between well development and the commencement of ground water sampling.

- No. 1070, Page Three - Twice the column of water added to the formation must be removed prior to sampling when the well development technique of hydraulic jetting is used.

  Pages 6 and 7 - The "Air Development Method" and the "Jetting Development Method" must not be used in well development. These two methods can strip volatiles from the developing wells and cause clogging of the formation/filter pack. In addition, air lifting techniques can induce metallic oxide formation/precipitation. EPA recommends employing the surge block and pumping technique which is an effective, non-contaminating well development procedure. Please note that at least 3 to 5 well volumes, plus the volume of water lost to the formation during drilling must be removed. In addition, the pumping rate should be measured and recorded during well development to ensure that the well is not purged at a rate greater than the development rate.

- <u>QA/QC and Data Management Plan</u>

  Section 3.3 - Page 8 - "Three parameters will be measured in the field for all aqueous samples: pH, temperature, and conductivity." Turbidity should be added to this list.

  Section 5.0 - Page 12 - The CLP SOWs should be changed to SOW ILM01.0 for inorganics and SOW OLM01.8 for organics. In addition, the analytical methods which will be used for the TCLP metal extract must be identified.

  Please refer to the attached method for the analysis of TPH in soils. The analytical method which will be used for "oil type identification" should be identified.

  Section 9.2 - Page 23 - "Sample Description (e.g. color) should be added to the list of field observations.

Should you have any questions or concerns in regard to the above, please do not hesitate to call me at (617) 573-5764.

Sincerely,

Carol A. Keating

Carol A. Keating
Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Paul Jameson, CTDEP
Matt Hoagland, U.S. EPA
Charlie Porfert, U.S. EPA
Patti Tyler, U.S. EPA
John Lindsay, NOAA
Steven Mierzykowski, USFWS
Norman Beddows, PFO
Dale Weiss, Alliance Technologies

ATTACHMENT I
(Special Technical Instructions)

Total Recoverable Petroleum Hydrocarbons in Soil/Sediment

1. Decant and discard any water layer covering a sediment sample.

2. The soil or sediment sample must be mixed thoroughly. Any foreign objects such as sticks, leaves and rocks are discarded.

3. A portion of the sample should be weighed out for moisture determination, to be carried out by drying overnight at 105°C. Method 3540, Part 7.2.1. If the sample contains more then 50% water (less than 50% solids) then more sample must be taken in order to reach the 20 gm of solid sample needed for analysis.

4. Blend 20g. of the solid soil sample with 20g. of anhydrous sodium sulfate and place in an extraction thimble. If the sediment sample is a sludge use the preparation described in Method 9071 7.2-7.6 using $Mg_2SO_4 \cdot 2H_2O$.

5. Extract samples according to Method 3540, Extraction of Nonvolatile and Semi-Volatile Organic Compounds from Solids.

6. Soxhlet extraction should be performed using 250 ml. of Freon 113. Extract the sample for four hours.

7. The 250 ml of Freon extract must be concentrated to 10.0 ml using a Kuderna Danish (K-D) concentrator equipped with a three ball Snyder Column. The freon is concentrated to approximately 10.0 ml or to a low volume capable of transfer to the silica gel column. To avoid loss of low molecular weight hydrocarbons, do not bring the concentrate to dryness.

8. A silica gel column as described in SW846 method 3630, Section 7.1.2, is prepared by loading activated silica gel onto the column using freon 113 solvent. The activated silica gel will remove polar compounds while allowing hydrocarbons to pass through.

9. The 10 ml of concentrated extract is loaded onto the column and allowed to elute at a rate of 2 ml/min. The rate can be measured using a volumetric cylinder and stop watch. When the level of sample solution reaches the upper surface of the sodium sulfate covering the silica gel, the 25 ml of freon 113 is loaded onto the column. The first 35 ml of freon is collected and should contain the petroleum hydrocarbons. The column must be eluted with only enough solvent to elute the petroleum distillates and not elute any polar or aromatic compounds. The 35 ml of solution is collected in a 50 ml volumetric flask. The eluate is then brought to mark with Freon 113.

10. The Standard reference oil is made as per Method 418.1 as follows:

15.0 ml	Hexadecane
15.0 ml	isooctane
10.0 ml	Chlorobenzene
40 ml	stored in a stopped bottle

1 ml of reference oil is weighed into a tared 200 ml volumetric flask, stoppered quickly and reweighed. The oil is diluted to 200 ml with Freon 113 and stoppered. This is the stock standard from which working standards are made. The concentration of this standard is calculated in mg/l.

11. A 1.0 gm solid sample of Lauramide (lauric acid amide) is weighed into a tared 200 ml volumetric flask and dissolved in 100 ml Freon 113. After dissolution the volumetric is brought to mark. This Lauramide solution will be mixed with the reference oil solution in a 0.5 mg/50 ml/0.5 mg/50 ml ratio to give a 0.25 mg/50 ml concentration of both. The equal mixture will be used to measure the separation efficiency of the silica gel column. Ten milliliters of the mixed reference and Lauramide solution will be passed through the silica gel column identically as a sample is passed through the column as in Paragraph 9.0. The concentration of the reference oil will be subsequently measured to determine the recovery. If the Lauramide remains in the solution after silica column separation, then the measurement of the reference oil at 2930 cm^{-1} will exceed the expected concentration of .25 mg/50 ml. The presence of Lauramide will create a high absorbance when the scan is started from 3200 cm^{-1} through 2700 cm^{-1}.

12. Calibrate the infrared spectrophotometer with the appropriate cell path using a series of five standards including a blank equivalent to .01 mg/50 ml to 1.0 mg/50 ml petroleum distillate. The standards are prepared as per Method 418.1 and Step 10.0. Prepare a calibration plot of absorbance vs. milligrams/50 ml petroleum hydrocarbons measured at 2930 cm^{-1}. Each sample and standard should be scanned from 3200 cm^{-1} to 2700 cm^{-1} and the maximum checked at 2930 cm^{-1}. Calculate the correlation coefficient for the plot using the least squares fit method. The correlation coefficient must be >0.995.

13. Fill the infrared cell from the 50 ml sample flask and scan the range from 3200 cm^{-1} to 2700 cm^{-1}. Measure the absorbance at 2930 cm^{-1} and record the reading.

14. The concentration of petroleum hydrocarbons in the samples should be calculated on a dry weight basis.

[redacted]

ATTACHMENT II
DELIVERABLES

1. Narrative explaining all anomalies and corrective actions taken. Included in the narrative should be a tabulation of the [redacted] sample numbers with the corresponding laboratory sample numbers.

2. Daily instrument calibration plot of styrene thin film.

3. Tabulated sample results; positive results and detection limits for non-detects.

4. Laboratory analysis notebook pages or bench sheets; all sample raw data including sample weight, dilutions, and concentration factors.

5. Tabulated results of duplicate and matrix spike analyses; tabulations of standard results and calibration verification results.

6. Calibration curve raw data.

7. Examples of sample results calculations.

8. Sample preparation logs.

9. Copies of [redacted] request, [redacted] packing lists, chain-of-custody, sample tags and shipping airbills.

10. Raw data for percent solids determination must be included.

11. Scans of Lauramide/reference oil check plots from 3200 cm^{-1} to 2700 cm^{-1}.

[redacted]

ATTACHMENT III

QC Requirements

Audits Required	Frequency Audits	Limits	Corrective Actions
1. Calibrate Spectrophotometer (wavelength) using styrene film	Daily	Must meet manufacturer's specification for wavelength	Call for help from manufacturer's representative.
2. Prepare a calibration plot of absorbance vs. mg petroleum hydrocarbons per 50 ml solution (.01 mg/50 ml to 1.0 mg/50 ml	Daily	Correlation Coefficient >.995	Make new working standards and prepare new calibration plot.
3. Method Blank	1 per 10 analytical samples	≤2 times DL	If >2 times DL, determine source of contamination and reanalyze blank. Limits must be met prior to analysis.
4. Laboratory Duplicate (Separate preparation of sample)	1 per 10 analytical samples	±20%	If not ±20%, rerun duplicate. If out of limit, proceed.
5. Matrix spike 0.20 mg/50 ml reference oil solution	1 per 10 analytical samples	80%-120% recovery	If not within limits repeat if not again proceed
6. Continuing Check Standard 0.20 mg/ 50 ml std reference oil solution	1 per 10 samples and at the end of analysis	±10%	If outside limits, recalibrate and rerun all samples run since last acceptable calibration check.
7. Separation check sample (Lauramide/ Ref oil mixture)	1 per 20 samples	No ore than +10% of reference oil concentration	If outside limit reseparate all related samples with new SiO_2 column since last compliant check.