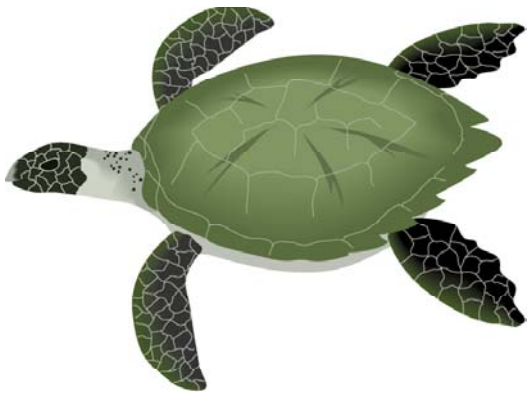
United States Air Force
15th Air Base Wing
Environmental Restoration Program

Final

WORK PLAN
FOR SITE INSPECTIONS
AT AREAS OF CONCERN 18, 20, AND 21

Bellows Air Force Station
Oahu, Hawaii



APPENDIX D

Supplemental Quality Assurance Project Plan (QAPP) Information

Appendix D
Supplemental Project-Specific Quality Assurance Project Plan Information

The *Installation-Wide Quality Assurance Project Plan for Multiple Projects at 15 ABW Installations in Hawaii, Version 1.0 (IWQAPP)* (CH2M HILL, October 1998a), together with the *Air Force Center for Environmental Excellence Quality Assurance Project Plan, Version 3.1 (AFCEE QAPP, Version 3.1)* (U.S. Department of the Air Force, August 2001), establishes the quality assurance/quality control (QA/QC) protocols and procedures that govern sampling and analytical activities for projects at 15 ABW installations. Unless otherwise noted below, all field staff and subcontractors participating in the Site Inspection (SI) at Bellows Areas of Concern (AOCs) 18, 20, and 21 will be expected to comply with the procedures specified in the *IWQAPP*. In addition, unless otherwise noted below, all samples will be preserved and analyzed in accordance with the *AFCEE QAPP, Version 3.1*.

The sections in this appendix contain the following project-specific information that supplements the *IWQAPP*:

- **Section 1:** The analytical methods required for each medium, including sample counts by individual site
- **Section 2:** Additional details for analysis of soil samples for volatile organic compounds (VOCs)
- **Section 3:** References

1.0 Media- and Site-Specific Analytical Methods

A summary of the analytical methods by media that will be used during the Bellows AOC SI project, and the approximate number of samples to be collected at each of the AOCs, are provided in Table D-1. All of the QA/QC specifications are provided in the IWQAPP.

2.0 Collection of Soil Samples for VOC Analysis Using Method SW5035

U.S. Environmental Protection Agency (EPA) Region IX has issued a *Regional Interim Policy for Determination of Volatile Organic Compound Concentrations in Soil and Solid Matrices* (U.S. EPA, June 1999). The technique described below is based on that document. In addition, AFCEE guidance will be followed to place the sample, prior to freezing, in pre-weighed volatile organic analysis (VOA) vials containing 5 milliliters (mL) of water for low-level analysis as has been done previously at Hickam AFB. This technique provides for the

handling of intact soil cores, for frozen storage in hermetically sealed containers, and for the minimization of analyte loss resulting from direct volatilization and biodegradation.

Undisturbed soil samples will be collected from soil borings or test pits, or by other means as described in the *Installation-Wide Field Sampling Plan (IWFSP)* (CH2M HILL, October 1998a). For each sample to be analyzed for VOCs, the laboratory will supply three pre-weighed VOA vials[1] with 5 mL of purge and trap grade water[2] as well as a single pre-weighed VOA vial without water. Two 5-gram (g) aliquots in water are needed for low-level analysis and reanalysis if necessary. One 5-g aliquot without water is needed for extraction in methanol in the case where high concentration target analytes are indicated during low-level analysis. One 1-g sample is needed because the possibility exists that neither the 5-g low-level sample or the 5-g high-level sample will fall within the calibration curve and could therefore result in data flagged "F" in laboratory analytical results (to indicate that an analyte was positively identified, but the associated numerical value is below the sample-specific reporting limit). Exposure to the air must be minimized by obtaining the soil sub-sample directly from the sample source (such as with a steel sleeve or a wide-mouth jar) using a disposable, cut-off, syringe-type coring device supplied by the laboratory. Three 5-g soil aliquots will be collected using the syringe and will be extruded into three 40-mL VOA vials (two with water and one without water). A fourth sub-sample of approximately 1 gm will be placed into one pre-weighed 40-mL VOA vial (with water). Place one label on each VOA vial.[3]

Calibration in the field should be conducted with the specific soil type and coring device to determine the proper setting on the coring device to collect 5-g and 1-g samples. (Example: Set the coring device to 5 mL, collect the sample, and weigh it. If 5.0 gm ±0.5 gm is not obtained, continue this process until you have identified the correct volume setting to collect 5.0 gm ± 0.5 gm. Repeat the same procedure for the 1-g sample.) Once the volume setting is identified, all soils of similar type will be collected at this volume. Samples will be labeled and identified as described in the IWFSP. If samples remain frozen, the laboratory has 7 days from the date of collection to analyze them. If samples thaw, they must be analyzed within 48 hours of collection. EPA Region IX has also provided guidance, via private communication, noting that if the samples are shipped at 4°C instead of frozen, the laboratory may freeze or preserve the samples within 48 hours of receipt to extend the holding time to 7 days if frozen or to 14 days if preserved.

VOC samples will be frozen by immediately placing them either in a cooler with dry ice in the field or in a designated freezer at a field trailer (if applicable). Samples will be shipped the same day as they are collected. The field team will then ship the samples by overnight

[1] These containers may be unique to a laboratory's instrumentation. Use only those containers specified by the subcontract laboratory.

[2] Care must be taken when extruding the sample into a liquid, so that no liquid splashes out of the container. Care must be taken so that no sample is left on the container or the cap threads, as this will prevent proper sealing of the container and cause possible leakage of the liquid.

[3] Three representative labels will be sent to the laboratory with the first shipment of samples. The laboratory will weigh them and use the average weight to correct the mass of the sample for the additional mass of the attached label on each vial.

express delivery; the samples must remain frozen until receipt by the laboratory. The specific shipping containers and methods necessary to ensure frozen shipments[4] and intact containers will vary from carrier to carrier and will be decided by the field manager.

If no other analyses are being performed, a 2-ounce jar of soil must also be collected to analyze for percent moisture.

3.0 References

CH2M HILL. October 1998a. *Installation-Wide Field Sampling Plan for Multiple Projects at 15 ABW Installations in Hawaii, Version 2.0*. Prepared for Air Force Center for Environmental Excellence, Environmental Services Office, Environmental Restoration Division (AFCEE/ERD), Brooks Air Force Base, Texas, and for 15th Air Base Wing CES/CEVR, Hickam Air Force Base, Honolulu, Hawaii.

CH2M HILL. October 1998b. *Installation-Wide Quality Assurance Project Plan for Multiple Projects at 15 ABW Installations in Hawaii, Version 1.0*. Prepared for Air Force Center for Environmental Excellence, Environmental Services Office, Environmental Restoration Division (AFCEE/ERD), Brooks Air Force Base, Texas, and for 15th Air Base Wing CES/CEVR, Hickam Air Force Base, Honolulu, Hawaii.

T.S. Dye and Colleagues. October 31, 2001. *Archaeological Monitoring Plan*.

U.S. Department of the Air Force. HQ Air Force Center for Environmental Excellence. Technical Services Quality Assurance Program. August 2001. "Quality Assurance Project Plan, Version 3.1" (AFCEE QAPP, Version 3.1). Appendix C in *Guidance for Contract Deliverables (GCD)*. [Online:] http://www.afcee.brooks.af.mil/er/qfw.htm (November 13, 2001).

U.S. Department of the Air Force. HQ Air Force Center for Environmental Excellence. Technical Services Quality Assurance Program. March 1997. "Model Field Sampling Plan, Version 1.1" ("AFCEE Model FSP, Version 1.1"). Appendix B in *Guidance for Contract Deliverables (GCD)*. [Online:] http://www.afcee.brooks.af.mil/er/qfw.htm (November 13, 2001).

U.S. Environmental Protection Agency. June 23, 1999. *Regional Interim Policy for Determination of Volatile Organic Compound (VOC) Concentrations in Soil and Solid Matrices*. U.S. EPA Region IX.

[4] Only these specific samples should be shipped frozen. All others require shipping conditions of 4°C, as specified in the AFCEE QAPP, Version 3.1.

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TABLE D-1

Approximate Sample Counts by AOC, Medium, and Analytical Method

Site Inspection at AOCs 18, 20, and 21, Bellows AFS, Oahu, Hawaii

	Analytical Methods										
	TPH-P (SW8015)	**TPH-E (SW8015)**	**VOCs (SW8260B)**	**SVOCs (SW8270C)**	**PAHs (SW8310)**	**Organochlorine Pesticides (SW8081A)**	**Chlorinated Herbicides (SW8151A)**	**PCBs (SW8082)**	**Explosive Residue (SW8330)**	**Metals (SW7000/ SW6010B)1**	**Dioxins/ Furans (SW8290A)**
AOC 18 (World War II Landfill)											
Surface Soil		6			6	6	6	6		6	6
Subsurface Soil	10	10	10		10	10	10	10		10	
Groundwater	4	4	4		4	4	4	4		4	
AOC 20 (Former Base Motor Pool)											
Surface Soil		9			9			9		9	
Subsurface Soil	10	10	10		10			10		10	
Groundwater	4	4	4		4			4		4	
AOC 21 (Former Decon Building)											
Surface Soil		5		5	5	5	5	5	5	5	
Subsurface Soil	4	4	4	4	4	4	4	4		4	
Groundwater	4	4	4	4	4	4	4	4		4	
TOTAL[a]											
Soil	**26**	**48**	**26**	**10**	**48**	**28**	**28**	**48**	**6**	**48**	**7**
Groundwater	**13**	**13**	**13**	**4**	**13**	**9**	**9**	**13**	**0**	**13**	**0**

Notes:

(a) Totals include normal samples and field duplicates and have been multiplied by 1.1 to include MS/MSD samples and equipment blanks. Trip blank samples are not included.

PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated biphenyls
SVOCs = semivolatile organic compounds
TPH-E = total petroleum hydrocarbons-diesel (and heavier-range) (extractable)
TPH-P = total petroleum hydrocarbons-gasoline (purgeable)
VOCs = volatile organic compounds