

**Final Work Plan Addendum
for the
Investigation and Corrective Measures Analysis
of the
Building 301 Area**

**Oceana Naval Air Station
Virginia Beach, Virginia**

Prepared for

**ATLANTIC DIVISION NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia**

Contract N62470-90-C-9638

Prepared by



December 1993

Certification

I certify that the information contained in or accompanying this Oceana Building 301 Work Plan Addendum is true, accurate, and complete.

As to those identified portion(s) of this work plan addendum for which I cannot personally verify their accuracy, I certify under penalty of law that this work plan addendum and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date: _____

Signature: _____

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LANTNAVFACENGCOM

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Introduction

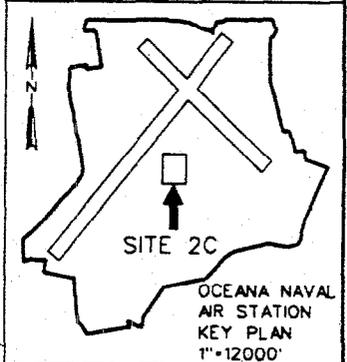
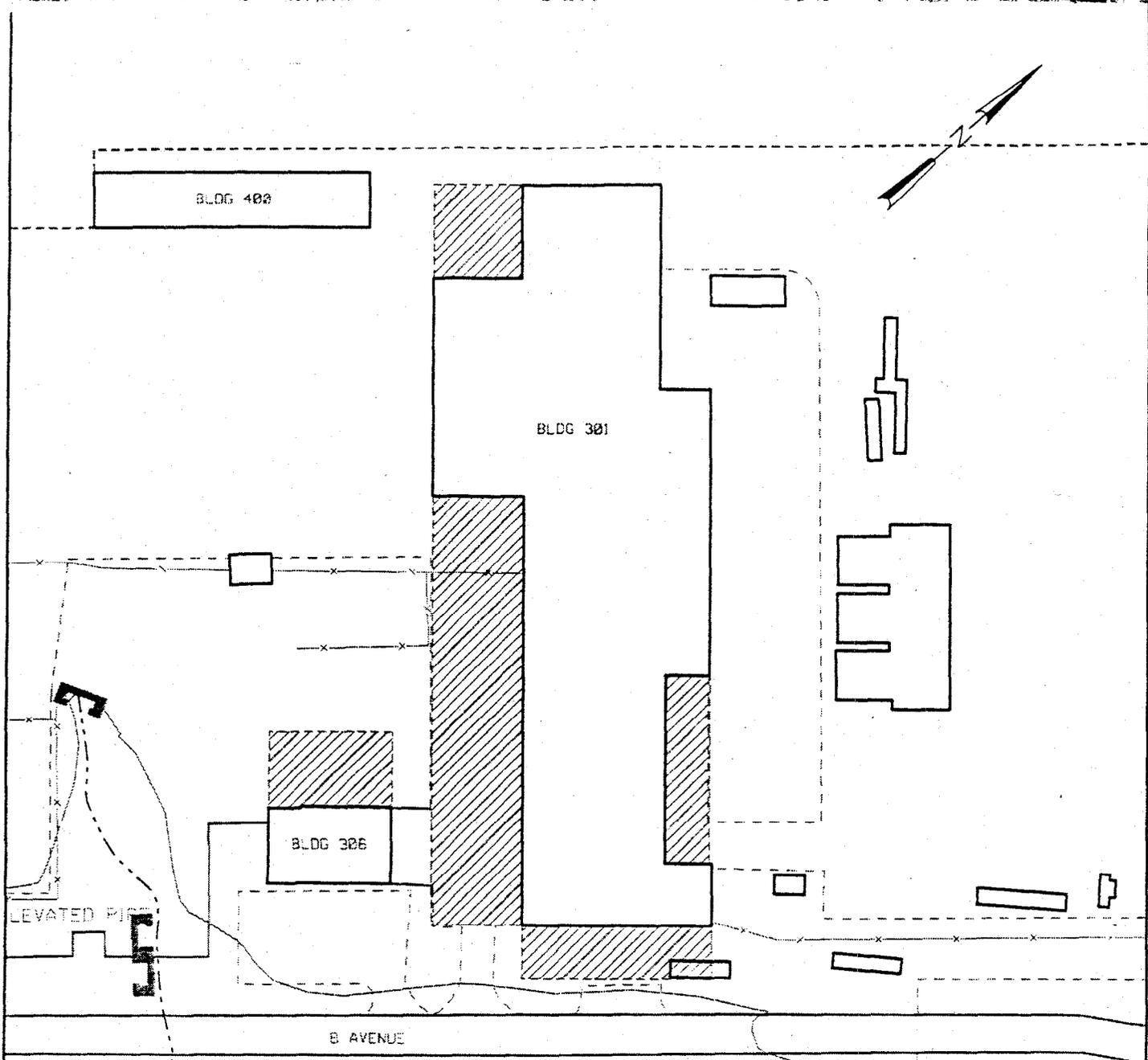
As part of the national consolidation of military activities and bases under the Base Realignment and Closure (BRAC) program, operations of a S-3 antisubmarine warfare unit are being moved to Oceana Naval Air Station from Cecil Field in Jacksonville, Florida. In order to accommodate this unit, additions to Buildings 301, 306, and 513 near the current FITWING area have been proposed. The additions to Buildings 301 and 306 are illustrated in Figure 1. Buildings 301 and 306 are at the periphery of an area where groundwater is known to be contaminated with chlorinated hydrocarbons and where some amount of soil contamination is suspected. This area is currently being investigated by the Navy under a Resource Conservation and Recovery (RCRA) Facility Investigation (RFI), and is known as solid waste management unit (SWMU) 2C. Because there may be contamination in the footprint of the new construction, the Navy and the EPA have agreed to investigate the soil and groundwater in these areas to protect the health of construction workers and enhance the environmental characterization of the SWMU 2C area. Construction may not proceed until the environmental status of these construction areas is known. This work plan describes the site investigation, construction risk assessment, and corrective measures analysis to be completed during the investigation of the Building 301 area. This work plan is written as an addendum to the existing RFI work plan, dated June 1992.

Past Investigations and Results

The SWMU 2C area has been investigated during three previous studies: the Line Shack Inspection Study in 1988 (CH2M HILL, 1989), the Interim RFI in 1990 (CH2M HILL, 1989), and the RFI in late 1992 and early 1993 (CH2M HILL, 1993). Groundwater was sampled in all three investigations and soils were sampled in 1988 and 1993. Most of the SWMU 2C area investigated during these three investigations is more than 100 feet from these two buildings and is not particularly relevant to the Building 301 work. Sampling within 100 feet of these two buildings is limited to two soil borings (B1 and B2) and three surface soils (SS5, SS6, and SS7) collected in 1988 and two wells (2C-MW3 and 2C-MW6) installed in 1988 and 1990. The results from these locations are shown in Table 1.

The distribution of groundwater contamination over the entire Site 2C is shown in Figure 2. Past investigations have shown that groundwater is contaminated with chlorinated hydrocarbons in two broad areas: near Building 400 and south of B Avenue in the woods southeast of Building 306. A full description of the distribution of contamination is given in the RFI draft report, dated June 1993.

The most concentrated chlorinated hydrocarbons detected in groundwater were vinyl chloride, trichloroethylene, cis-1,2-dichloroethylene, and 1,1-dichloroethane. The areas of highest groundwater contamination are 100 to 1,000 feet from Building 301 and 306. Groundwater contamination in the two wells within 100 feet of the two buildings was comparatively low. No contamination was detected in 1993 in well 2C-MW6 at the northeast corner of Building 301. Contamination in 2C-MW3 in 1993 was 6 parts per



LEGEND

-  PROPOSED CONSTRUCTION AREA
-  DRAINAGE DITCH

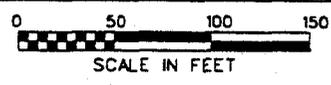


Figure 1
 PROPOSED EXTENSIONS OF
 BUILDINGS 301 AND 306
 BUILDING 301 INVESTIGATION
 OCEANA NAS



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Table 1
ORGANIC COMPOUNDS IN GROUNDWATER AND SOIL NEAR BUILDING 301 AND 306
RESULTS OF PREVIOUS INVESTIGATIONS
 (All Data in $\mu\text{g/l}$)

Analyte	Detection* Limit	Monitoring Wells					Soil Borings				Surface Soils		
		2C-MW3			2C-MW6		B1		B2		SS5	SS6	SS7
		Sept. 88	Aug. 90	Jan. 93	Aug. 90	Jan. 93	Sept. 88		Sept. 88		Sept. 88	Sept. 88	Sept. 88
							3-5 Ft.	8-10 Ft.	3-5 Ft.	8-10 Ft.			
EDB	0.02	N/A	*	N/A	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPH	60	N/A	290	N/A	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds													
Acetone	10	*	9 bj	N/A	9 bj	N/A	*	17 b	*	*	58 b	*	*
Benzene	5	5	4 j	N/A	2 j	N/A	*	*	*	*	*	*	*
Chloroform	5	*	*	*	*	*	6 b	7 b	*	*	*	*	*
1,1-Dichloroethane	1, 5	*	3 j	2.2	*	*	*	*	*	*	*	*	*
Ethylbenzene	5	*	1 j	N/A	2 j	N/A	*	*	*	*	*	*	*
Methylene chloride	1, 5	*	4 bj	*	8 b	*	170 b	*	130 b	*	160 b	18 b	68 b
Toluene	5	*	*	N/A	*	N/A	*	*	*	*	6	*	*
Vinyl chloride	1, 10	*	11	6.0	*	*	*	*	*	*	*	*	*
Xylenes (total)	5	5	3 bj	N/A	5 b	N/A	*	*	*	*	16	*	*
Notes: *The detection limits for the volatile organic compounds analyzed in January 1993 were 1.0 $\mu\text{g/l}$. In 1988 and 1990, detection limits were 5 or 10 $\mu\text{g/l}$. - All volatile and semivolatile organic compounds not listed above were not detected in any samples at any time. EDB = Ethylene Dibromide TPH = Total Petroleum Hydrocarbons NA = Not analyzed b Compound found in laboratory blank as well as sample; sample concentrations is less than 10 times blank concentration j Estimated value: measured value is less than the accurately quantitative detection limit. * Concentration below detection limit.													

DC-00143-04.05-12/01/93

billion (ppb) of vinyl chloride and 2.2 ppb of 1,1-dichloroethane. Vinyl chloride in 2C-MW3 was above the Maximum Contaminant Level (MCL) of 2 ppb.

No significant soil contamination was detected in 1988 or 1993. Table 1 shows that the soils collected in 1988 contained primarily constituents that were also detected in the laboratory blank and therefore may not actually be present. The 6 ppb of toluene and 16 ppb of total xylenes in SS5 indicate possible low levels of fuel-related contamination. No solvent contamination was detected in the soils. In the 1993 RFI soil sampling, no contamination was detected except for 68 ppb of cis-1,2-dichloroethylene in sample 2C-SB3, collected from 3 to 5 feet near the southwestern end of Building 400.

Field Sampling Plan

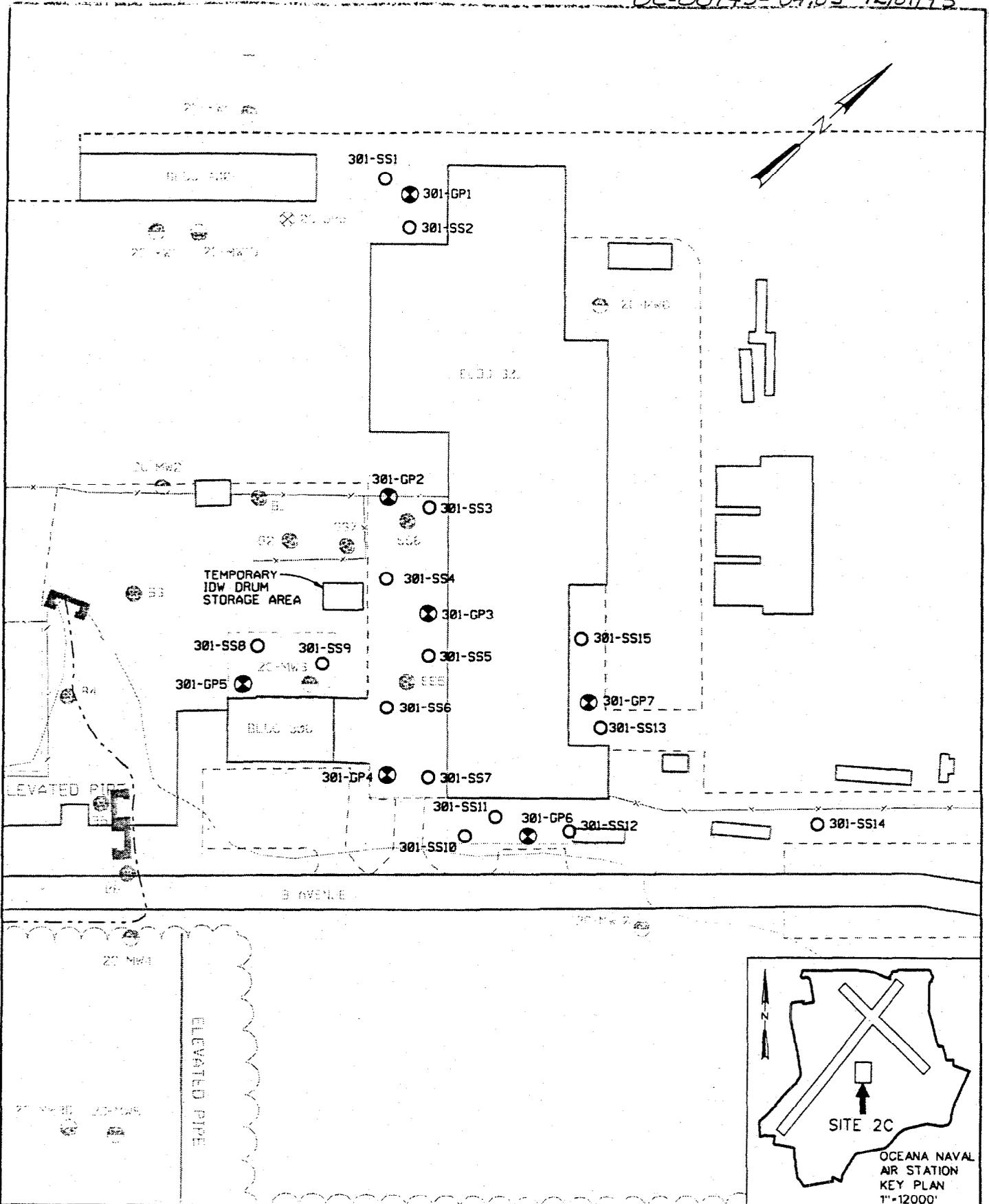
Sampling Locations

The groundwater and soils adjacent to Buildings 301 and 306 will be investigated by collecting seven groundwater samples and fourteen soil samples within the areas that will be covered over by the extensions to these buildings. A fifteenth soil sample will be collected from a background location along B Avenue. Proposed extensions are illustrated in Figure 1. Table 2 is a summary of the analytical sampling during the investigation.

Medium	Number of Samples	Types of Analysis
Soil	15	VOCs, TPH
	2	TCLP metals, TCLP VOCs, TCLP semivolatiles
In-situ Groundwater	7	VOCs, TPH

Analytical methods: SW-8240 for TCLP VOCs and VOCs, 415.2/SW-9060 for TPH. A detection limit of 2 ppb will be used for vinyl chloride in water. TCLP metals will be analyzed using SW-6010/7000 methods. TCLP semivolatiles will be analyzed using method SW-8270.

The proposed sampling locations are illustrated in Figure 3. This figure also shows the locations of environmental samples that were collected near these buildings during past environmental investigations in 1988, 1990, and 1992/1993. The proposed samples are distributed between the five areas of new construction but are most concentrated in the extension to Building 306 and the southwestern extension to Building 301. Two soil samples (301-SS1 and 301-SS2) and one in-situ groundwater sample (301-GP1) will be



LEGEND

- EXISTING SHALLOW MONITORING WELL
- EXISTING DEEP MONITORING WELL
- EXISTING SOIL SAMPLING LOCATION
- EXISTING HYDRAULIC PROBE SAMPLING LOCATION
- PROPOSED HYDRAULIC PROBE SAMPLING LOCATION
- PROPOSED SOIL SAMPLING LOCATION
- DRAINAGE DITCH

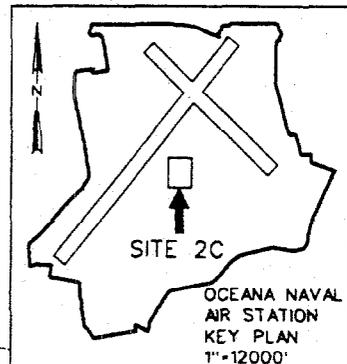
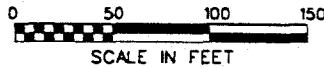


Figure 3
 PROPOSED SAMPLING LOCATIONS
 BUILDING 301 INVESTIGATION
 OCEANA NAS



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 ONAS301B02.dgn

collected in the northwest corner of Building 301. This area is between 2C-MW1, which contained 210 ppb of vinyl chloride in January 1993, and 2C-MW6, an uncontaminated background well. Well 2C-MW5, which contained 11 ppb of vinyl chloride in 1993, is also nearby. Because groundwater flows south and consequently the northeast corner of this building is upgradient of known contamination, it is anticipated that groundwater contamination will be low or absent.

Two soil samples (301-SS13 and 301-SS15) and one in-situ groundwater sample (301-GP7) will be collected from the area underlying the extension to the northeast wall of Building 301. Past data do not suggest that there is contamination in this area; however, the source of contamination in wells 2C-MW10 and 2C-MW4 has not been determined and could be near this area. There are no known incidents of waste disposal underlying this extension.

Three soil samples (301-SS10 to 301-SS12) and one in-situ groundwater sample (301-GP6) will be collected from the area immediately southeast of Building 301. 7.8 ppb of total chlorinated volatiles were detected in well 2C-MW10 to the southeast across B Avenue. There are no known incidents of waste disposal in this area.

One background soil sample (301-SS14) will be collected from a depth of 3 to 4 feet at a location along B Avenue to serve as a basis for comparison to samples collected adjacent to the buildings. This sample will be collected from a location that appears clean and will be collected from 3 to 4 feet to avoid possible near-surface incidental contamination.

Two soil samples (301-SS8 and 301-SS9) and one in-situ groundwater sample (301-GP5) will be collected northwest of Building 306. Because well 2C-MW3 will be covered over by this extension, it will be abandoned according to Virginia regulations during the Building 301 field work. The well will not be sampled before it is abandoned because it was sampled in January 1993 and concentrations in this well have not varied substantially since 1988. This well will be replaced later during the RFI Phase II site investigation of Site 2C. Contamination above the MCL for vinyl chloride has been detected in the area underlying this extension, therefore, contamination at the proposed in-situ sampling location is possible. The in-situ groundwater sample will be collected in the southwest corner of this extension to maximize the coverage of groundwater sampling. One additional groundwater sample will be collected from this extension if elevated concentrations are detected at location 301-GP5.

Five soil samples (301-SS3 to 301-SS7) and three in-situ groundwater samples (301-GP2 to 301-GP4) will be collected from the area underlying the large southwestern extension to Building 301. Most of this area is upgradient of well 2C-MW3. The southeastern end of this extension, where sample 301-GP4 is proposed, is cross-gradient to 2C-MW3. Because this southeastern end is between two contaminated wells (2C-MW3 and 2C-MW10), contamination may be detected in 301-GP4. If contamination is not detected in 301-GP2 and 301-GP3 but is detected in 301-GP4, one additional in-situ groundwater sample will be collected between 301-GP3 and 301-GP4 to determine the extent of contamination between the two locations.

Sampling Procedures

Soil Sampling

Soil samples will be collected down to the water table using a hand auger. Samples will be collected from areas with surface soil discoloration where present, but otherwise will be distributed horizontally as indicated in Figure 3. Some of the soil and groundwater samples will be collected from locations covered with asphalt or concrete; therefore, the first sampling activity will be to select sampling locations and penetrate the asphalt or concrete with an electric jack hammer, as appropriate. The asphalt or concrete will be removed down to the base of the slab at all locations before beginning sampling. To prevent VOCs from volatilizing out of the boring, the construction fill underneath the concrete or asphalt will not be removed until the hand augering begins.

The samplers will auger to the water table, or as deep as possible without caving, at each location and will collect one sample from the most contaminated depth, as determined from visual signs and readings from an OVA, OVM, or HNu. If there is no discoloration, odor, or other indication of contamination, the sample will be collected from 1 to 2 feet. At locations with concrete or asphalt, the construction fill below the slab will be removed immediately before sampling. Augering and sampling will continue below the construction fill to the water table. At these locations, the sampling depth in the absence of signs of contamination will also be 1 to 2 feet below grade, or 0 to 1 foot below the construction fill, whichever is deeper.

In practice, the sampler cannot observe discoloration of intervals until they are brought to the surface in the auger, therefore, it is not possible to identify the most visibly contaminated interval until the boring is completed. The field procedure will be to collect a sample when augering through the 1 to 2 foot interval at each location where the 0 to 1 foot interval does not appear contaminated and to supersede this sample with a sample from a deeper interval if it appears more contaminated than the 1 to 2 foot sample. The exception will be at locations where the 0 to 1 foot interval appears contaminated, in which case a sample will be collected from 0 to 1 feet. Augering will continue to the water table at each location; however, at locations with discoloration from 0 to 1 foot a sample will be collected from below 1 foot only if it appears more contaminated than the 0 to 1 foot sample. If any interval appears to be more contaminated than a previously sampled interval, the shallower sample will be discarded.

All soil brought to the surface in the auger that is not shipped as a sample will be discarded into large polyethylene bags marked with the boring number. These bags will be placed adjacent to the borings to collect soil that may fall from the auger as it is withdrawn from the borings. As the bags are filled, they will be tied off with plastic ties and placed in 55-gallon steel drums. The drums will be marked to indicate the soils that they contain.

Each soil sample will be analyzed for Total Petroleum Hydrocarbons (TPH) and SW-8240 volatile organic compounds (VOCs). The samples will be analyzed for VOCs because all

the constituents detected in past investigations were volatile organics. TPH will be analyzed to determine if waste oil, fuels or lubricants (POL) have been disposed near these buildings. Although there is no record of such disposal, Buildings 301 and 306 are used for maintaining aircraft engines, so disposal of POLs nearby is a possibility.

Two soil samples will be also be composited from four of the borings and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP metals and TCLP semivolatiles. One TCLP sample will be composited from two of the four borings and the other sample will be composited from the other two borings. Each pair of borings will be within distinct areas or subareas where excavation may occur. The samples will not be analyzed for TCLP herbicides, TCLP organochlorine pesticides, or TCLP dioxins/furans because there is no history of disposal or use of these compounds in this area. The samples will be analyzed for TCLP to determine if soils excavated during construction should be considered hazardous wastes by toxicity characteristics. It is assumed that the wastes will not be corrosive, ignitable, or reactive because of the inert nature of soils and the low anticipated contaminant concentrations. These properties will not be tested or analyzed; therefore, TCLP results below standards will be taken to indicate that the wastes are not hazardous by characteristics.

The four locations for composite TCLP sampling will be chosen at the discretion of the CH2M HILL field geologist. These composite samples will be collected after the original 15 borings are completed so that field observations can be given full consideration in selecting sampling locations. In the absence of signs of substantial contamination elsewhere, the two composites will be collected from four borings near the southwestern addition to Building 301 and the addition to Building 306 because these two areas are close to the reported disposal areas at Site 2C and are most likely to have groundwater contamination. Unless contamination is found at other depths while sampling the initial 15 borings, the TCLP samples will be collected from 0 to 2 feet.

Each of the two composites will be collected from two locations by augering second borings to 2 feet within 12 inches of the initial borings. The TCLP VOC sample will be collected by filling half the sample container with soil from 1.0 to 2.0 feet at one boring and filling the other half with soil from 1.0 to 2.0 feet at the second location. All remaining soil volume from these intervals and from both borings down to 2 feet will be placed in a stainless steel bowl and mixed thoroughly. After mixing the soil, the TCLP metals and TCLP semivolatile sample containers will be filled and the remaining soil discarded into a separate polyethylene bag. The TCLP VOC sample will not be mixed in the bowl along with the rest of the soil to avoid volatilization of the organic compounds.

In-Situ Hydraulic Probe Sampling

The groundwater samples will be collected using a Geoprobe® hydraulic probe sampler. The Geoprobe® hydraulic probe sampling procedure consists of driving a 3/4-inch diameter hollow slotted steel rod to the desired depth and then sampling through polypropylene tubing equipped with a foot valve. The hydraulic probe sampler will be mounted on a

four-wheel-drive pickup truck. Samples will be collected from 9 to 12 feet through the 3-foot slotted lead rod. The tubing will be changed between sampling locations and all rods will be decontaminated by scrubbing them in a solution of no-phosphate detergent, followed by rinses in tap water and deionized water. Because this wash water will include only wetting residues and a few grams of soil in a large volume of water, it will be discharged directly on the ground.

The samples will be analyzed for Target Compounds List (TCL) VOCs and total petroleum hydrocarbons (TPH) in CH2M HILL's laboratory in Montgomery, Alabama. Only VOCs and TPH will be analyzed because in previous sampling of Site 2C in 1988, 1990 and 1993, only volatile organics were detected. The TPH will be analyzed to determine if waste oils, fuels, or lubricants were disposed near these two buildings. A detection limit of 2 ppb will be used for vinyl chloride.

Other Field Procedures

Well Abandonment

Well 2C-MW3 will be abandoned by introducing cement grout from the bottom of the screen upwards to the surface. Cement grout will be placed in the well by funneling grout into a 1-inch diameter PVC pipe lowered to the bottom of the screened zone 18 feet below grade. Grout will be placed into the well until all water is displaced out the screen or the top of the well. A thin plastic apron will be placed around the well to collect the displaced groundwater, which will then be put in drums. To allow for easier construction, CH2M HILL personnel will attempt to grout the well to grade rather than to the top of the casing.

Repair of Borings

Each augered boring will be backfilled to the surface with a clean fine sand brought to the site in bags. In-situ hydraulic probe holes will be backfilled to 6 inches below the surface with bentonite powder, then filled to the surface with sand. At locations where asphalt or concrete was penetrated to collect either a hydraulic probe or a soil sample, the fill will be brought to the base of the former slab and the concrete or asphalt will be repaired. Asphalt will be repaired with asphalt patch and concrete will be repaired by mixing pre-mixed concrete with additional cement and coarse aggregate to restore the quality of the existing slab.

Investigation-Derived Wastes

All soils removed from the subsurface will be discarded into large polyethylene bags and then into 55-gallon steel drums to prevent exposure to potentially contaminated soils. Personal protective equipment, construction fill underlying asphalt or concrete, and tubing and expendables used in the in-situ sampling will also be placed in 55-gallon drums. The concrete or asphalt rubble will be disposed in dumpsters on the base after being placed in bags. The drums will be sealed, marked with paint, and identified with proper labelling.

The drums will be stockpiled adjacent to Building 301, at a location designated by NAS Oceana personnel, pending the results of the TCLP analysis.

The soils in this area would be considered hazardous wastes if they were either listed or characteristic wastes. Characteristic hazards include toxicity, corrosivity, reactivity, and ignitability. Toxicity will be determined by the proposed TCLP analyses but the corrosive, reactive, and ignitable hazard of the soils will not be tested on the assumption that the soils are inert. Evidence to the contrary in the field will be cause for reevaluation and possible testing.

Past consideration of the generation and disposal history at this site has lead to the conclusion by the Navy that the wastes discharged to the ground at Site 2C were not listed hazardous wastes. As part of this investigation, NAS Oceana and LANTDIV will review Navy records for the Building 301/306 area to confirm that the discharged wastes and the soils, if they are contaminated by these wastes, should not be considered a listed hazardous waste.

The analytical results from TCLP, VOC, and TPH analyses will be reviewed and a preliminary assessment of investigation-derived waste (IDW) hazards will be described in a technical memorandum to the Navy and the EPA. The drummed wastes will be handled by CH2M HILL following Navy decisions concerning IDW handling and/or disposal.

If the TCLP results are below TCLP limits and it is determined that the waste stream was not listed, the soil will be dispersed on the ground adjacent to the building or included in the excavated volumes generated during construction of the extensions. If dispersed, the soils will be removed from the marked bags and dispersed near the boring from which they were removed if a soil surface is present. Soils from concrete areas will be dispersed in grassy areas that will later be covered by the extensions. Personal protective equipment will be discarded in ordinary dumpsters if the TCLP results show no toxicity hazard.

If the samples contain contaminant concentrations above TCLP limits, the samples and the soils near the borings from which they came will be considered hazardous. Because the status of all other borings will be unknown, all soils in the drums will be assumed hazardous, primarily because the cost of testing them would exceed the cost of handling them as potential hazardous wastes.

The soils at the borings where TCLP composites were not collected will be compared to the TCLP results. This comparison will consist of calculating the ratio of VOC concentration in the samples from the four borings to the corresponding TCLP VOC concentrations from the same locations. These ratios will then be applied to the VOC results from the remaining 11 borings to infer whether TCLP VOC limits may have been exceeded had TCLP VOC also been analyzed at these locations. If the result is greater than 80 percent of the TCLP limit for any volatile constituent at any boring, additional soil sampling for TCLP will be performed at that location. TCLP metals and TCLP semivolatiles will be assumed to be below limits at the eleven remaining borings if they are below limits at the four composited borings. If TCLP metals and TCLP semivolatiles are

above limits in either composite sample, more TCLP sampling from other locations will be necessary.

Quality Assurance/Quality Control and Data Validation

All field observations and data will be recorded in log books, including sample location numbers, signs of contamination, measurements, depth and time of sampling, dates, units and personnel involved in site work. Data will be recorded, tabulated, and validated as specified in Chapter 5—Data Management Plan of the June 1992 RFI Work Plan.

The quality assurance/quality control (QA/QC) procedures followed during this investigation will be essentially identical to those followed during the RFI. These QA/QC procedures are specified in Appendix A of the RFI work plan. One difference will be in the frequency of equipment blanks, which will be collected every other day rather than every day. Another difference will be that a detection limit of 2 ppb will be used for vinyl chloride so that non-detects are known to be below the MCL of 2 ppb. Other detection limits will be as specified in Attachment B of Appendix A of the RFI work plan.

All samples will be shipped to the CH2M HILL laboratory in Montgomery, Alabama. The soil and groundwater sampling data will be reported following NEESA Level C guidelines. This is a high level of QA/QC appropriate for cases in which litigation is not anticipated. The data will be validated following NEESA Level C data validation standards, with the exception of TCLP, which will not be validated. No field QC samples will be collected for TCLP. Field QC ratios for the soil samples for VOCs and metals will follow guidelines stated in Appendix A of the RFI work plan (CH2M HILL, 1992).

Validation will also follow EPA protocols specified in *Laboratory Data Validation Functional Guidelines for Evaluating Organics and Inorganics Analyses* and *U.S. EPA Region III Functional Guideline Modifications*. Data validation is described in more detail in Chapter 5 of the RFI Work Plan (CH2M HILL, 1992).

Health and Safety Plan

Site work will be governed by the requirements of the health and safety plan, as modified from Chapter 6 of the RFI work plan (CH2M HILL, 1992). The health and safety plan was modified slightly to apply to the timing and personnel of the Building 301 work as well as other RFI activities anticipated in late 1993 and early 1994.

Community Relations

Community relations will be as specified in the Community Relations Plan (CH2M HILL, 1991b), as amended and updated.

RFI Addendum Report

An RFI addendum report will be written presenting the results of the Building 301 investigation. The analytical results will be presented in tables similar to the tables in the RFI report. These results will be reviewed and compared to human health criteria for soils and groundwater presented in Appendix A and Chapter 4 of the RFI report (CH2M HILL, 1993). The risk to human health during construction will also be discussed, as described below. A feasibility study and cost comparison of remediation options, with recommendations for construction features necessary to prevent contaminant migration and protect human health, will also be included in the report. The report will be formatted as an addendum to the existing RFI report, which will be a necessary companion volume to the Building 301 report.

Construction Worker Exposure Evaluation

As part of the RFI addendum report on the Building 301 investigation, worker exposure potential to volatiles and airborne dust from excavation and construction will be evaluated. Exposure routes will include inhalation and ingestion, if appropriate. (Protective measures against unacceptable worker exposures are normally covered by the construction contractor's site health and safety plan.) Soil-to-air volatilization or particulate emissions factors will be used to estimate respirable concentrations based on soil sampling data. This evaluation will be based on a dust dispersion model that estimates the amount of dust generated during construction and the exposure to dust constituents based on the soil sampling results. The groundwater pathway will not be considered during the construction worker exposure evaluation because excavation is not expected below 4 feet; therefore, it is expected that the groundwater will not be contacted or removed during construction.

Remedial Action Study

A remedial action study based on the analytical results will be prepared and presented in the report. The remedial action study will include a feasibility study of remediation options, with cost estimates of a +50 percent to -30 percent level of accuracy. The soil remediation options will be selected based on the analytical results but are expected to include costs to excavate and dispose: (1) in a municipal solid waste landfill, (2) in a RCRA hazardous waste landfill, and (3) by treating the soils using the two most favorable treatment options outlined in Chapter 3 of the RFI work plan (CH2M HILL, 1992).

The two treatment options will be chosen for detailed analysis using the best professional judgement of experienced CH2M HILL environmental engineers. The rationale for not preparing a detailed analysis for other potentially appropriate technologies listed in Chapter 3 will be explained briefly in the report. The remedial action study will include recommendations for any construction features necessary to protect the health of construction workers or to assure that construction structures do not induce contaminant migration. An example of the latter would be the use of auger-cast piles instead of standard piles when constructing the extensions.

Schedule

This project is on an accelerated track to meet strict site construction deadlines of the base realignment and closure program. It is anticipated that construction of the extensions will begin in July 1994 if environmental conditions are not shown to be prohibitive by the investigation results. The schedule for the work plan addendum submission, field investigation, risk and corrective measures analysis, and reporting is shown in Table 3. Work plan submittal deadlines are included because investigation dates are tied to the work plan schedule.

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CH2M HILL, June 1992. RCRA Facility Investigation Final Work Plan.

CH2M HILL, June 1993. RCRA Facility Investigation Draft Report.

NEESA, June 1988. Sampling and Chemical Analysis Quality Assurance Requirements for Navy Installation Restoration Program, NEESA 20.2-047B.

WDCR757/015.51

Table 3 SCHEDULE OF BUILDING 301 INVESTIGATION	
Task	Submittal Date
Submit Draft Work Plan Addendum to LANTDIV	October 13, 1993
CH2M HILL Receives LANTDIV Comments on Work Plan Addendum	October 18, 1993
Submit Draft Final Work Plan Addendum to EPA Region III	October 25, 1993
Receive EPA Comments	November 15, 1993
Submit Final Work Plan Addendum	November 25, 1993
Begin Field Work. Sequence: (1) Hydraulic Probe Sampling, (2) Soil Sampling, (3) IDW Handling and Well Abandonment	December 6, 1993
End Field Work	December 17, 1993
Submit Draft Report to LANTDIV	February 17, 1994
Receive LANTDIV Comments	February 24, 1994
Submit Draft Final Report to EPA Region III	March 3, 1994
Receive EPA Comments	April 4, 1994
Submit Final Report	April 18, 1994

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