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FINAL

RCRA FACILITY INVESTIGATION WORK PLANS
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

ADDENDUM 2

ADDITIONAL INVESTIGATIONS AT CERTAIN OU 1, 6 AND 7 SWMUs

NAVAL STATION
ROOSEVELT ROADS, PUERTO RICO

CONTRACT TASK ORDER 0173

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Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
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1.0 INTRODUCTION

Naval Station Roosevelt Roads was issued a RCRA Permit to operate a hazardous waste storage facility in October, 1994. The permit contained provisions for "Corrective Action" at the Station in accordance with the Hazardous and Solid Waste Amendments (HSWA) of 1984. Among the varied requirements was one which mandated Phase I RCRA Facility Investigations (RFIs) at a number of Solid Waste Management Units (SWMUs) identified in the permit. Phase I RFIs are designed to be a screening tool to assess whether there may be an historical or ongoing release of hazardous waste or hazardous constituents from a unit.

The Station took the list of SWMUs and combined them into Operable Units (OUs) which addressed groups of SWMUs having similar location, use, or expected potential contaminants. Investigatory work for OUs 1, 6 and 7, which contain all the SWMUs requiring Phase I investigations, were undertaken in 1995 and 1996 and the results were provided to the EPA in a report entitled "RCRA Facility investigation Report for Phase I Investigations at Operable Units 1, 6 and 7, Naval Station Roosevelt Roads, Ceiba, Puerto Rico" (July 1996).

The results of the Phase I, coupled with EPA comments on the draft report received in November, 1996 indicated the need for additional investigations at some of the SWMUs because of evidence that releases to one or more environmental media had occurred. It is the purpose of this work plan addendum to provide details regarding the scope of, and rationale for, additional investigations at apparently affected sites.

The scope of investigatory work described in subsequent sections of this addendum only addresses the actual work elements at each site. All the other elements normally comprising Work Plans (e.g., Health and Safety Plan, Quality Assurance Project Plans) rely on the Final RCRA Facility Investigation Work Plan (Baker, September, 1995). All sampling will be conducted in accordance with the applicable SOP contained in Appendix B of the Data Collection Quality Assurance Plan. [Note: This document is Addendum 2 to the Work Plans. Addendum 1 addressed the Tow Way Fuel Farm (OU2) investigations.]

2.0 ADDITIONAL INVESTIGATIONS

2.1 Introduction

Section 2.0 provides details of the proposed additional investigations. Included in each discussion is a description of the site background and present status, details of the proposed investigatory scope, a detailed rationale which explains each element of the scope and a description of the intended data use.

The sites addressed in this work plan addendum are:

- SWMU 10 (Substation 90)
- SWMU 26 (Building 544 Area)
- SWMUs 31 and 32 (Public Works Yard)
- SWMU 46 (Pole Storage Yard Covered Pad)
- AOC C (Transformer Storage Pads)
- SWMU 13 (Pest Control Shop)
- SWMU 11/45 (Building 38 Cooling Water Tunnel)

In addition, a number of general considerations related to the overall investigations are discussed in this section.

2.2 SWMU 10 (Substation 2 - Building 90)

2.2.1 Site Background/Status

The soils in the area immediately adjacent to the substation were found to contain significant concentrations of PCBs. An Interim Corrective Measure (ICM) was performed at the site which consisted of contaminated soil removal. The ICM close-out report was provided to the EPA. Groundwater sampling was not a part of the initial investigations or the ICM. Based on the presence of a significant concentration of PCBs in the soil, the potential for groundwater to be impacted was apparent and, therefore, a groundwater sampling effort was included in the OU 1, 6 and 7 Phase I RFI. The sampling effort was not successful due to site subsurface conditions. Because the initial

sampling program did not result in obtaining sufficient groundwater information, a new sampling program has been devised and is presented in this work plan addendum.

2.2.2 Additional Investigations

Scope

Two temporary monitoring wells will be installed at the site in the approximate locations shown on Figure 2-1. The wells will be constructed of 4-inch diameter PVC and will be screened across the wetted zone at the top of bedrock. A bentonite seal will be placed at the collar of the boring to prevent entry of precipitation.

A sample of groundwater will be extracted from each temporary well. No purging or development will be performed because of the expected small amount of groundwater infiltration. Each sample will be analyzed for VOCs, SVOCs, and PCBs. The order of sample collection will be PCBs first, VOCs second, and SVOCs last. It may be necessary to composite samples for PCBs and SVOCs due to the expected slow recharge of the well and the relatively large volume of sample required for these analyses. Upon verification of successful sample analysis, the casing will be removed from the temporary well and the boring will be backfilled with a mixture of drill cuttings and bentonite.

In the event that an insufficient quantity of groundwater is present to obtain samples for the various parameters, the temporary casing will be removed and the hole will be advanced to a depth where groundwater supplies are adequate for sampling. A temporary well will be installed at the appropriate depth as previously described.

Rationale

Previous investigations at this site using Hydropunch® technology failed to retrieve sufficient groundwater for analysis. These investigations did, however, identify a water containing layer 6-inches to 1-foot thick at the approximate base of the soil column. Since this represents the first occurrence of groundwater below the spill zone, it represents the water most likely to show any effect from PCBs in the soil. It is the thought that, by using a relatively large diameter well and not

developing or purging the well prior to sampling, sufficient water can be obtained to run the appropriate analyses.

This is especially the case if a composite sample over time is taken. While this is not the ideal case, the results should be acceptable since it is really the PCB results which are desired and this analyte is least affected by the composite sampling technique.

Data Use

The intent of the investigation is to assess whether PCBs have migrated to the groundwater from the soil. Analytical data will be reviewed to see if PCBs are present.

2.3 SWMU 26 (Building 544 Area)

2.3.1 Site Background/Status

Building 544, demolished in 1990, housed a vehicle maintenance operation for at least a portion of its existence. The RFA conducted in 1988 found approximately 25 drums at the rear of the building, some of which were seen to contain engine lubricating oil. The drums were removed in 1990 and the soil underlying the area where the drums were stored was moved approximately 20 feet and stockpiled.

A soil gas survey was conducted in the area where the drums were stored and where the soils are stockpiled. This survey did not detect significant levels of volatile organics. Surface soil samples taken at the site indicated the presence of arsenic and beryllium at some points above the residential risk-based concentration (RBC) and a variety of semivolatile constituents at low levels.

The Building 544 Area is located within the "Bundy" portion of the station. Bundy is the primary location for base housing and, therefore, it is possible that the Building 544 Area could be used for base housing expansion at some point in the future. This fact, plus the EPA comments on the Draft OU 1, 6 and 7 RFI Report, leads to the conclusion that additional investigations are required at the site.

2.3.2 Additional Investigations

Scope

A total of 10 sampling locations have been selected to comprise the additional investigations (see Figure 2-2). Seven of the locations are within the SWMU and three are well outside the SWMU area and will serve as background sampling points.

Surface soil samples will be obtained at each location from the soil just below the root zone in accordance with the appropriate SOP as contained in the original RFI Work Plans. A boring will be advanced at each location with a hand auger to a depth of approximately three feet. The soil from approximately two and one-half to three feet will be retained and submitted for laboratory analysis.

Each sample collected will be subjected to analysis for:

- Arsenic
- Beryllium
- VOCs
- SVOCs
- PCBs

Rationale

The sampling density selected will result in samples being obtained on 30-foot centers at the most and, in many cases, much less (when considering the initial sampling points also). This will provide sufficient areal coverage and data quantity to characterize the surface and subsurface soils.

The presence of arsenic and beryllium above residential RBCs was noted by the EPA in their comments. While this is not disputed, the concentrations are likely the result of background conditions (based on work performed at other areas of the station) and do not represent a release from the SWMU. This area is relatively remote from other SWMUs and the area where background information was obtained; therefore, site-specific background data will be developed utilizing the three points indicated on Figure 2-2.

Data Use

The data from this investigation will be combined with that available from the first effort. A full Human-Health Risk Assessment (HHRA) will be performed using all the data. Arsenic and beryllium, should they continue to be detected, will be carried through the risk assessment; however, any risk posed by concentrations of these species which are statistically within background levels will be discounted.

2.4 SWMUs 31 and 32 (Public Works Yard)

2.4.1 Site Background/Status

The area is comprised of open parking/storage areas adjacent to Building 31 which houses the Station's Public Works Department. SWMU 31 was used for the management of waste vehicle oils and SWMU 32 contained numerous scrap batteries during the initial RFA. Neither area is presently utilized for waste management activities.

The draft Phase I report indicated that there was no unacceptable risk posed by the areas for continued industrial use. It is the Navy's intent to place a land-use restriction on the site limiting it perpetually to industrial uses. However, A.T. Kearney comments regarding the risk assessment for dioxin caused this to be recalculated with the result being that a slight risk to on-site workers was posed by the low level of dioxin present. It should be noted that no dioxin waste was managed at the site nor did waste burning take place. The result of the recalculated human health risk indicates the need to perform additional sampling at the site.

2.4.2 Additional Investigations

Scope

Eight surface soil samples are proposed at approximately the locations shown on Figure 2-3. The samples will be obtained from the zone 3 to 9 inches below the ground surface. Samples will be analyzed for dioxins only.

Rationale

The depth of sampling selected is designed to avoid the large gravel pieces that work their way to the surface when repeatedly traversed by vehicles. Sampling at this depth will allow the collection of a more representative soil sample.

The area of sampling includes the possible location of "previous uncontrolled storage," and the area immediately adjacent. It should be noted that dioxins were not found at SWMU 31 and 32 and was only detected at an unquantifiable level in sample 31SS02 and at measurable levels in sample 31SS04 which were both taken in the "uncontrolled storage" area. Samples taken between these locations did not contain detectable dioxin. Therefore, sampling is concentrated in the area where previous detection of dioxins occurred.

Data Use

The risk assessment indicated a slight risk to on-site workers was driven by the single sample taken at 31SS04. The data gathered in this additional sampling will be combined with that from the previous round and a new risk will be calculated.

2.5 SWMU 46 (Pole Storage Yard Covered Pad)

2.5.1 Site Background/Status

The site was originally listed as a SWMU based on the presence of electrical equipment and scrap on the pad during the initial RFA. The reinspection conducted in 1993 found the pad to be empty, however, it was kept as a SWMU because of its former use. Since that time, the pad has been upgraded with spill control measures and is being used for an under 90-day storage facility by the base operations support contractor.

Initial investigations at the site indicated relatively low levels of some semivolatiles, arsenic and Aroclor-1260. The arsenic is likely naturally occurring based on knowledge of background conditions. PCB is the major constituent of concern even though the concentrations are relatively

low ranging from a maximum of 3.6 ppm to non-detect in the samples. This notwithstanding, the EPA has requested full characterization of the surface and subsurface soils in the area of the pad.

2.5.2 Additional Investigations

Scope

Fifteen additional surface soil samples are proposed at the approximate locations shown on Figure 2-4. Sampling methodology will be in accordance with the applicable SOP as provided in the Final RFI work plans. Combined with the initial investigation, the total number of surface soil samples will be 26.

Thirteen random locations have been selected for subsurface soil sampling. Emphasis was placed on obtaining subsurface samples near the pad. At each location, a hand auger will be advanced to three feet depth. The sample portion from two and one-half to three feet will be retained for laboratory analysis. Should insufficient sample volume be obtainable from this zone, the hole will be advanced another six inches.

All the samples will be subjected to laboratory analysis for semivolatile organics, PCBs, arsenic and beryllium.

Rationale

The scope of the investigations is designed to fully characterize the surface and subsurface soils at the site as requested by the EPA. Having samples both close to and away from the pad will allow an assessment of contamination extent to be made and will identify any hot spots immediately adjacent to the pad. Also, the number of samples to be obtained will allow a full human health risk assessment to be calculated. It should be noted that the site will be placed under a "land-use restriction" by the Navy which will limit its future use to industrial applications.

The analytical parameters selected are based on the findings of the initial investigation. Only those suites of analytes in which positive detections were seen are being repeated in these additional investigations.

Data Use

The data from the additional investigations will be combined with that from the initial work to form a unified database. This database will be utilized to perform a full human-health risk assessment. Both residential and industrial health risks will be assessed; however, the site will be restricted to industrial land use in perpetuity by the Navy.

2.6 AOC C (Transformer Storage Pads)

2.6.1 Site Background/Status

AOC C was originally included in the corrective action provisions of the RCRA permit based on the fact that numerous transformers and other electrical equipment were being stored on the pads prior to off-site disposal. There were oily stains noted both on and off the pads.

An initial investigation was performed which included 12 surface soil samples. PCBs were found in six of the 12 samples with the highest concentration of 5,200 ppm in one sample at the western end of the northernmost pad (see Figure 2-4).

During maintenance activities at the site, in preparation for the 1996 hurricane season, the soils in the vicinity of the pads was inadvertently stripped to a depth of up to approximately one foot and stockpiled nearby. This stockpile was rigorously characterized and, with the consent of the EPA, the pile was disposed in the base landfill. This action was taken based on the fact that the highest level of PCBs seen in the pile was 8.6 ppm.

The soils originally characterized in the OU 1, 6 and 7 investigations have been removed from the site; therefore, a recharacterization of the site is necessary. In addition, the EPA has indicated that, since there were significant concentrations of contaminants seen in the surface soil before it was removed, both the surface and subsurface soils need to be fully characterized.

2.6.2 Additional Investigations

Scope

Twenty-six surface soil samples will be collected at the approximate locations shown on Figure 2-4. It should be noted that 12 of the sample locations generally coincide with the points originally sampled. Sampling methodology will be in accordance with the applicable SOP contained in the Final RFI Work Plans.

Fourteen subsurface soil samples will be obtained using a hand auger at the locations shown on Figure 2-4. In each boring, cuttings from the zone between two and one-half and three feet will be retained for laboratory analysis. Should an insufficient volume of soil be available from this zone, the boring will be advanced an additional six inches to provide an acceptable quantity of sample.

Each sample will be analyzed for volatile and semivolatile organics, PCBs and Appendix IX metals.

Rationale

The areal distribution of sampling points will provide adequate coverage to detect releases and fully characterize the soil both near the pads and in the general area which could reasonably be expected to be affected by releases from the storage pads. It should be noted that subsurface samples are concentrated in the immediate vicinity of the pads as this is considered to be the area where extensive or repeated releases could have occurred which may have driven contamination deeper into the soil zone.

The analytical suites selected provide for analysis of all the constituents detected in the first round of sampling.

Data Use

The analytical data will be used to assess the areal and vertical extent of contamination, if any. A human-health risk assessment will be performed on the data for both the residential and industrial land-use scenarios. The residential scenario will only be provided for information since it is the

Navy's intent to place a "land-use restriction" on this property that will relegate it to industrial use in perpetuity.

2.7 SWMU 13 (Pest Control Shop)

2.7.1 Site Background/Status

SWMU 13 has been subjected to three previous investigations each of which has further defined conditions at the site. It has been determined that there are no unacceptable risks posed by the surface soils at the site and, therefore, no additional characterization is required for this media. There is unacceptable risk posed by the sediments in the drainage ditch, especially in terms of the potential ecological receptors. Finally, although groundwater was sampled in the very early investigations, there is no detailed understanding of groundwater flow at the site nor has it been adequately demonstrated that groundwater is unaffected. Based on these conditions, additional investigations will be performed at the site addressing groundwater and sediments.

2.7.2 Additional Investigations

2.7.2.1 Sediment Investigation

Scope

A single surface sediment sample will be taken from the drainage ditch at the furthest possible point north of the site. The approximate proposed location of this sample is shown on Figure 2-5. This location will serve as a background point for data comparisons.

Deep sediment samples will be taken at the approximate locations shown on Figure 2-5. A boring will be advanced with a hand auger to a depth of three feet. The samples obtained from 1-1/2 to 2 feet and 2-1/2 to 3 feet will be retained for laboratory analysis.

Shallow sediment samples will be taken at the approximate locations shown on Figure 2-5. It should be noted that these samples will be taken on the side wall of the drainage ditch at a similar centerline

position of a deep sediment samples. This strategy will provide information on the extent of contamination on a cross-sectional basis.

As can be seen on Figure 2-5, the drainage ditch enters a concrete headwall and goes underground at the south end of the large concrete pad. Little is known regarding this drainage system. It will be one of the efforts of this investigatory program to search for old drawings of the system and to physically walk the drainage ditch to attain an understanding of what happens to the drainage once it exits the site.

If the drainage resurfaces farther down, the surface sediments in the ditch will be sampled. If the drainage system does not reappear on the surface, the first catch basin downstream of the site will be accessed and a sample taken of the sediments, if any are present.

Analysis of all the sediment samples will be for volatile and semivolatile organics and pesticides.

Rationale

The background sample is required for two reasons. First, it will be used as a point of comparison for downstream drainage samples to ascertain the effect on the drainageway sediments from the site. Second, the background sample will be used to assess the possibility that contamination is being imported to the site through flow in the drainage ditch.

Deep sediment samples are required to provide information about the depth of contamination. Samples will be obtained from the center of the ditch since this area is expected to be the most highly contaminated and has the most potential for exhibiting contamination at depth. The information obtained will be used in the analysis of possible corrective measures since it will provide details of the quantity of sediments/underlying soils that may be affected.

Sidewall sediment samples will be used to assess the extent of contamination away form the centerline of the drainageway.

Off-site ditch sediments will be sampled to see if contamination has migrated away from SWMU 13 via the drainage.

The analytical suites selected for this program (VOCs, SVOCs and pesticides) will be sufficient to adequately characterize the nature of site-related contamination. Their selection was based on the results of previous investigations in which only significant detections were members of these analytical groups.

Data Use

The information obtained from the sediment sampling program will be used to assess the extent of contamination knowledge of the extent of impact will allow the full analysis of remedial options. In addition, human-health and ecological risks will be reassessed to ascertain the extent of corrective measures required and to establish clean-up goals should remediation be required.

Downstream drainage sampling results will be used to determine whether contamination has migrated off-site and whether additional characterization or remedial work is warranted.

2.7.2.2 Groundwater Investigations

Scope

There are four existing monitoring wells at the site which were installed during the confirmation study. The condition of the wells will be assessed and, if apparently useable, the wells will be redeveloped and sampled as a part of this investigation. If any of the existing wells are found to be damaged beyond repair or are unusable for some other reason, these wells will be abandoned (grouted in place) and replaced.

Three new wells will be installed in the approximate locations shown on Figure 2-5. Soil samples will be obtained on 5-foot centers or less, as deemed appropriate by the field geologist. This sampling will only be for stratigraphic description and groundwater occurrence purposes; no samples will be retained for laboratory analysis. Once the boring is complete, a 2-inch diameter, PVC well will be installed. The well will be equipped with a 10-foot screen which will extend approximately eight feet into the uppermost water bearing unit.

The new monitoring wells will be developed and a groundwater sample will be obtained for laboratory analysis of volatile and semivolatile organics and pesticides.

One complete set of water level measurements will be obtained from all of the wells when they are in equilibrium (e.g., before development activities or a suitable period of time after sampling). These measurements will be used to prepare a potentiometric surface map for the site.

Rationale

There is significant pesticide contamination present in the drainage ditch and, while posing no human-health risk, there are also pesticides in site soils. Based on this, there is the possibility that contamination has migrated downward to the water table. It is for this reason that groundwater will be sampled.

The groundwater measurements will be used to construct a potentiometric surface map of the site. This will provide information regarding groundwater flow patterns and rates that could be used to predict contaminant migration direction and rate should any be detected.

The well locations have been selected to provide reasonably full coverage of the site. Existing well 18GW01 will serve as background. Groundwater flow, based on the topography, is expected to be toward the south or southeast. The wells have been located so as to not only monitor groundwater directly under the site, but also to intercept flow as it exits the site.

The groundwater analytes selected mirror those for sediment and are reflective of historical findings at the site.

Data Use

The data will be used to assess whether contamination has migrated to the groundwater.

2.8 SWMU 11/45 (Building 38 Cooling Water Tunnel)

2.8.1 Site Background/Status

The cooling water tunnels associated with Building 38 have been the subject of numerous studies over the past years. The most recent program was an Interim Corrective Measure designed to clean out the tunnels and remove them as a potential continuing release source. [Note: The ICM close-out report will be available shortly.] During the cleaning of the tunnel interior, it became evident that the tunnels were not tight since a large quantity of water (apparently groundwater) was entering the tunnels. At one point where water inflow was particularly heavy (approximately five manways away from the building towards Puerca Bay), the ICM contractor dug a test pit to see if the cause of the inflow could be determined by looking at the outside of the tunnel. This proved to be a fruitless endeavor in terms of its goal, but did provide significant information regarding site conditions. When the subsurface soils near the tunnel were exposed they were found to be heavily oil stained. Based on this finding, an investigation of the soils surrounding the intake tunnel appears warranted. [Note: The tunnels have now been filled with concrete and do not contain water; therefore, they cannot act as a continuing release point.]

2.8.2 Additional Investigations

Scope

The soils surrounding the entire length of the intake tunnel leading to Puerca Bay from the building will be investigated using Geoprobe® technology. Geoprobe® borings will be made on approximately 50-foot centers along the tunnel as shown in concept on Figure 2-6. Borings will be staggered on both sides of the tunnel. A second and third set of borings will be made on 100-foot centers on both the north and south side of the tunnels. These lines of borings will be made approximately 50 feet away from the tunnel on each side.

Each boring will be advanced to a point a minimum of two feet below the tunnel invert. The borings will be continuously sampled to the depth of the tunnel and the subsurface stratigraphy will be visually logged by the site geologist. Samples from any hole exhibiting contamination (either through visual, olfactory or instrumental [PID/FID] evidence) will be retained for laboratory

analysis. Should no contamination be seen, a sample from every other boring, taken from the depth equivalent to the bottom of the tunnel, will be submitted for laboratory analysis.

If contamination is evident in soil samples taken from the outer row of borings (i.e., those 50 feet away from the tunnel), another boring will be made 50 feet further away from the tunnel to assess subsurface conditions. This approach will continue until a boring is completed that has no evidence of contamination. All borings completed following this strategy (including the last "clean" boring) will be sampled and a portion retained for laboratory analysis.

Laboratory analysis will be performed on each sample for the following:

- Volatile organics
- Semivolatile organics
- PCBs
- Appendix IX metals
- TPH

In addition to subsurface soils, it appears prudent to also investigate groundwater in the vicinity of the tunnel. A groundwater sample will be obtained using the Geoprobe® tools at every other boring. Should additional borings be required away from the tunnel, each of these will retrieve a groundwater sample. Analysis of the groundwater samples will be for the same parameters as those for soil. The only difference will be that a portion of the groundwater sample will be filtered with analysis being made for both total and dissolved metals.

Sediment sampling at the intake entrance in Puerca Bay was done as part of the Supplemental RI/FS performed at the site. The single sample obtained showed evidence of contamination potentially related to releases from the tunnel.

Based on this, an expanded sampling program is proposed as follows:

- One sediment sample will be collected at the mouth of the tunnel.

- A series of three samples will be taken in an arc approximately 50 feet away from the mouth of the tunnel.

- A series of three samples will be taken in an arc at a distance of approximately 100 feet from the tunnel mouth.

- Two samples will be taken 200 feet from the tunnel.

The proposed array of sampling points is shown on Figure 2-6. All samples will be obtained using a sampling dredge.

Analysis of the sediment samples will be for the same parameters as used for the tunnel soils.

Rationale

The planned array of borings will provide samples for an assessment to be made of the nature and extent of any contamination which may be found. Geoprobe® technology is proposed because it allows the rapid advancement of borings to obtain both soil and groundwater samples without the need to install permanent monitoring points. It is also financially attractive in that it allows many more sampling points to be accessed which provides for a cost-effective use of government funds.

The analytical suites proposed were selected based on the findings from previous sampling efforts. The potential contaminants which could have been released from the materials in the tunnel are all represented by these analytical suites.

The array of sampling point sin the Puerca Bay will provide sufficient information to assess the extent of release from the tunnel to the sediment.

Data Use

The data obtained from these investigations will be used to assess risk to human health and the environment posed by any contamination found in the subsurface soils, groundwater or sediments associated with the intake tunnel. In addition, the investigations have been carefully designed to

provide sufficient information for the analysis of all possible remedial alternatives should a corrective measure study be necessary.

2.9 Miscellaneous Investigation Considerations

This section contains some miscellaneous investigations and related work that are required for the work proposed in the previous sections.

2.9.1 Surveying

All sampling locations will be flagged in the field and will be surveyed using established control. This surveying will be performed by the firm which did the previous work to ensure that the same level of survey quality and detail is attained.

2.9.2 Data Validation

All laboratory data generated by these investigations will be subjected to independent, third party, validation. EPA Region II Data Validation SOPs will be followed. The same firm which has performed data validation for the previous RFI steps will continue. This will ensure that the same techniques are followed and that an equivalent review of the data is performed.

2.9.3 Laboratory Analysis

All laboratory analyses will be performed in accordance with the methodologies contained in the approved Final RCRA Facility Investigation, Naval Station Roosevelt Roads, Puerto Rico (Baker, September, 1995) Work Plans.

2.9.4 Investigation Derived Waste (IDW)

The only investigation derived waste expected to be generated during this program will be at SWMU 13 where well installation, development and sampling will be performed. These wastes will be managed in accordance with the SOP contained in the Final Work Plans.

At SWMU 10 where temporary wells will be installed, the cuttings will be retained until groundwater is sampled. When the temporary well is abandoned, the cuttings will be mixed with powdered bentonite and use as boring backfill.

Wastes generated by hand augering are limited to very small amounts of cuttings. Likewise, Geoprobe® work produces little cuttings. Any cuttings which are remaining after this work will be mixed with powdered bentonite and returned to the hole from which they came. As much as possible, soils last out of the hole will be placed first thereby approximating original stratigraphy.

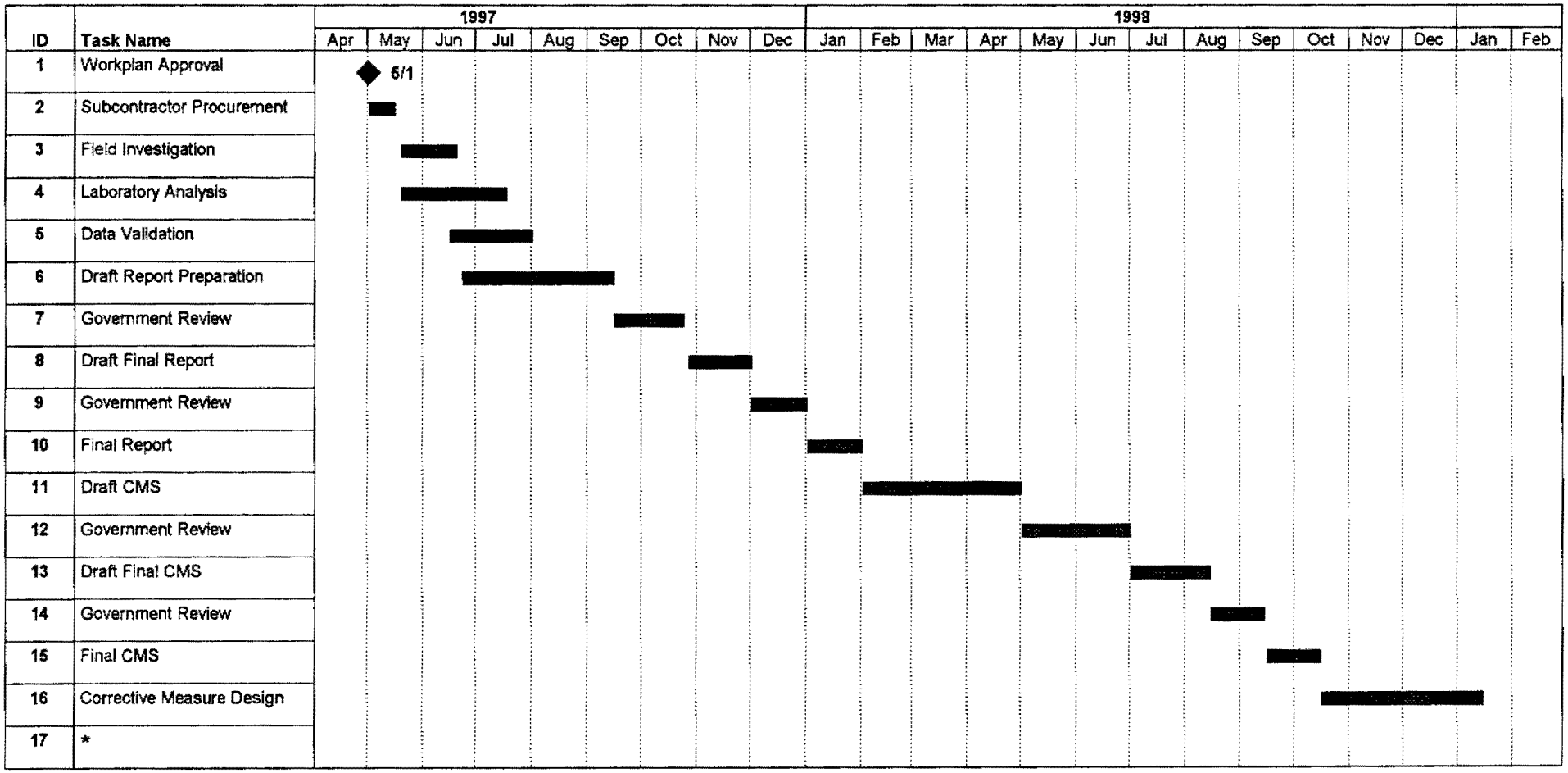
2.9.5 Standard Operating Procedures (SOPs)

All the SOPs required to complete the investigations described herein are provided in the Final RFI Work Plans with the exception of the work involving the Geoprobe®. This SOP has been included as Appendix A.

3.0 SCHEDULE

Figure 3-1 shows the schedule for the additional RFI work described in Section 2.0.

Figure 3-1
Final RFI Workplans Addendum 2 - Project Schedule
Additional Investigations OU 1, 6 and 7 Naval Station Roosevelt Roads



* Additional schedule items to be determined base on scope of corrective measure.

FIGURES

173102WP

FORRESTAL DRIVE

BUS STOP

TRANSFORMER PAD

ELECTRIC SUBSTATION NO. 2 WITH GRAVEL BASE

BLDG. NO. 90

VALLEY FORGE ROAD

Baker

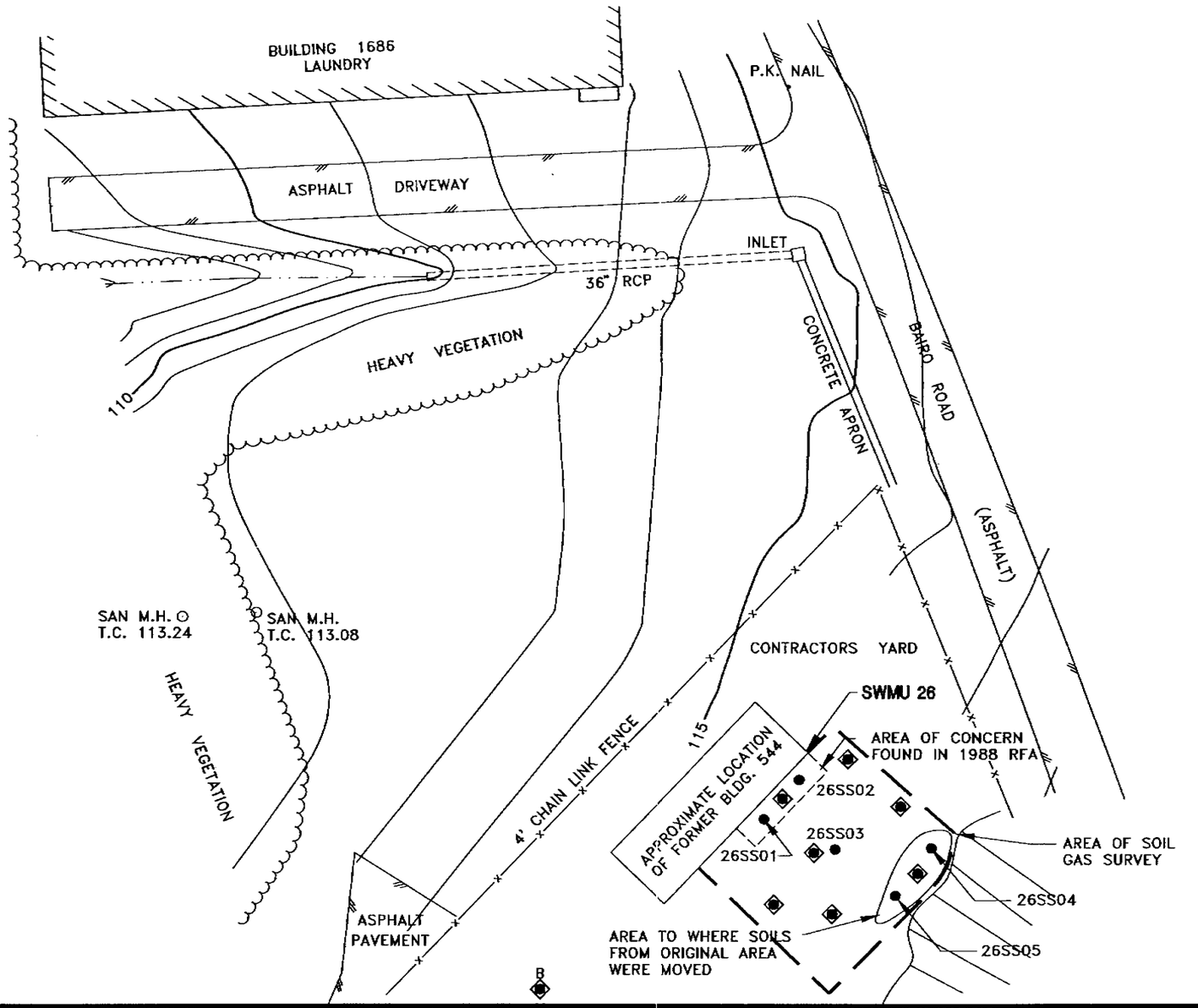
Baker Environmental, Inc.

LEGEND

- CONTOUR LINE WITH ELEVATION
- BUILDING OR STRUCTURE
- PROPOSED TEMPORARY MONITORING WELL

FIGURE 2-1
PROPOSED ADDITIONAL INVESTIGSTIONS
SWMU 10 SUBSTATION 2/BUILDING 90

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



NOTE: TWO ADDITIONAL BACKGROUND SAMPLES WILL BE OBTAINED FROM A AREA SOUTH OF SWMU 26.

173101WP

Baker

Baker Environmental, Inc.

LEGEND

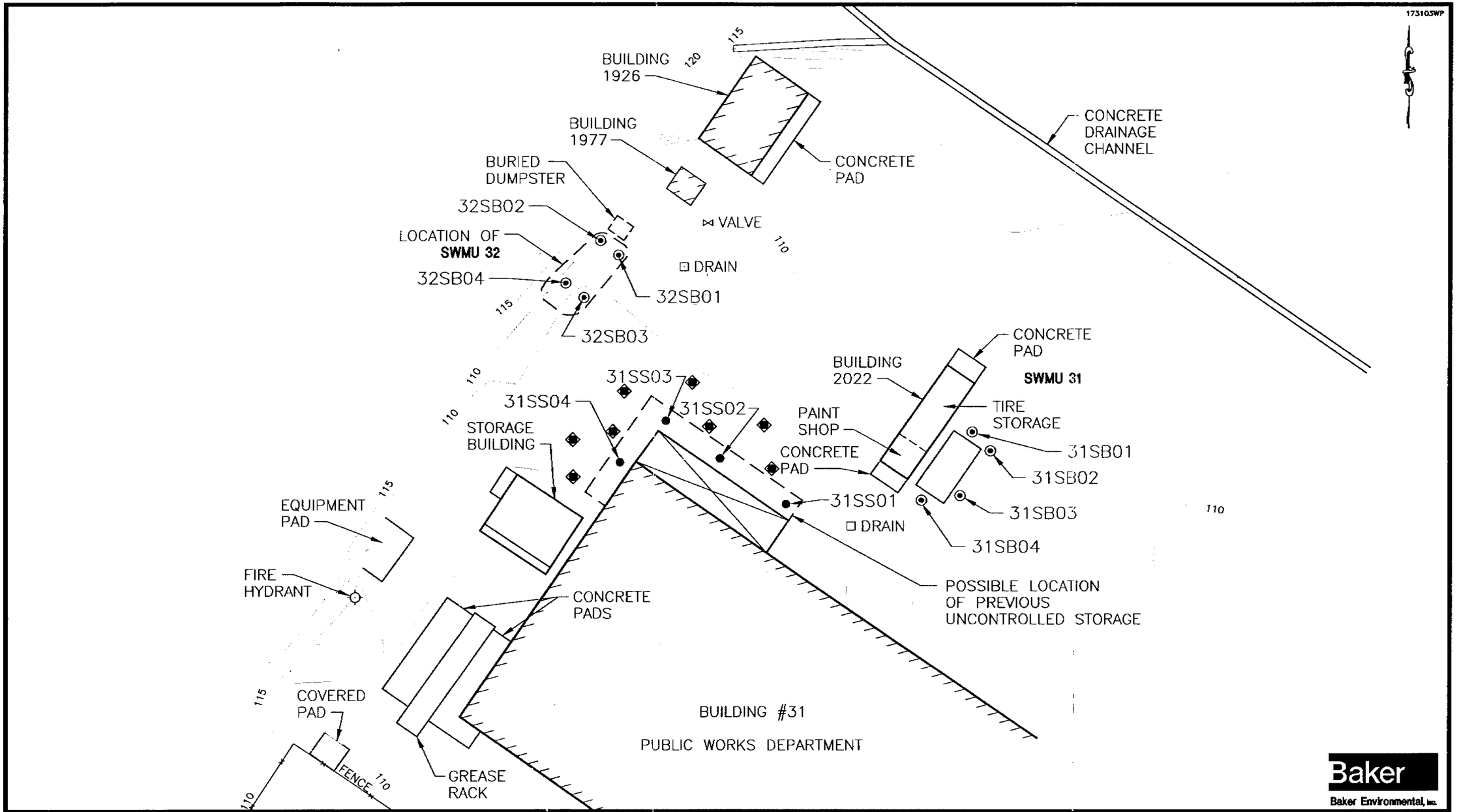
- ● PHASE I RFI SAMPLING LOCATION
- ◈ PROPOSED SOIL SAMPLING LOCATION
- B ◈ PROPOSED BACKGROUND SOIL SAMPLING LOCATION
- 110 SURFACE ELEVATION CONTOURS

50 0 25 50 100

1 inch = 50 ft.

FIGURE 2-2
PROPOSED ADDITIONAL INVESTIGATION
SWMU 26 – BUILDING 544 AREA

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



LEGEND

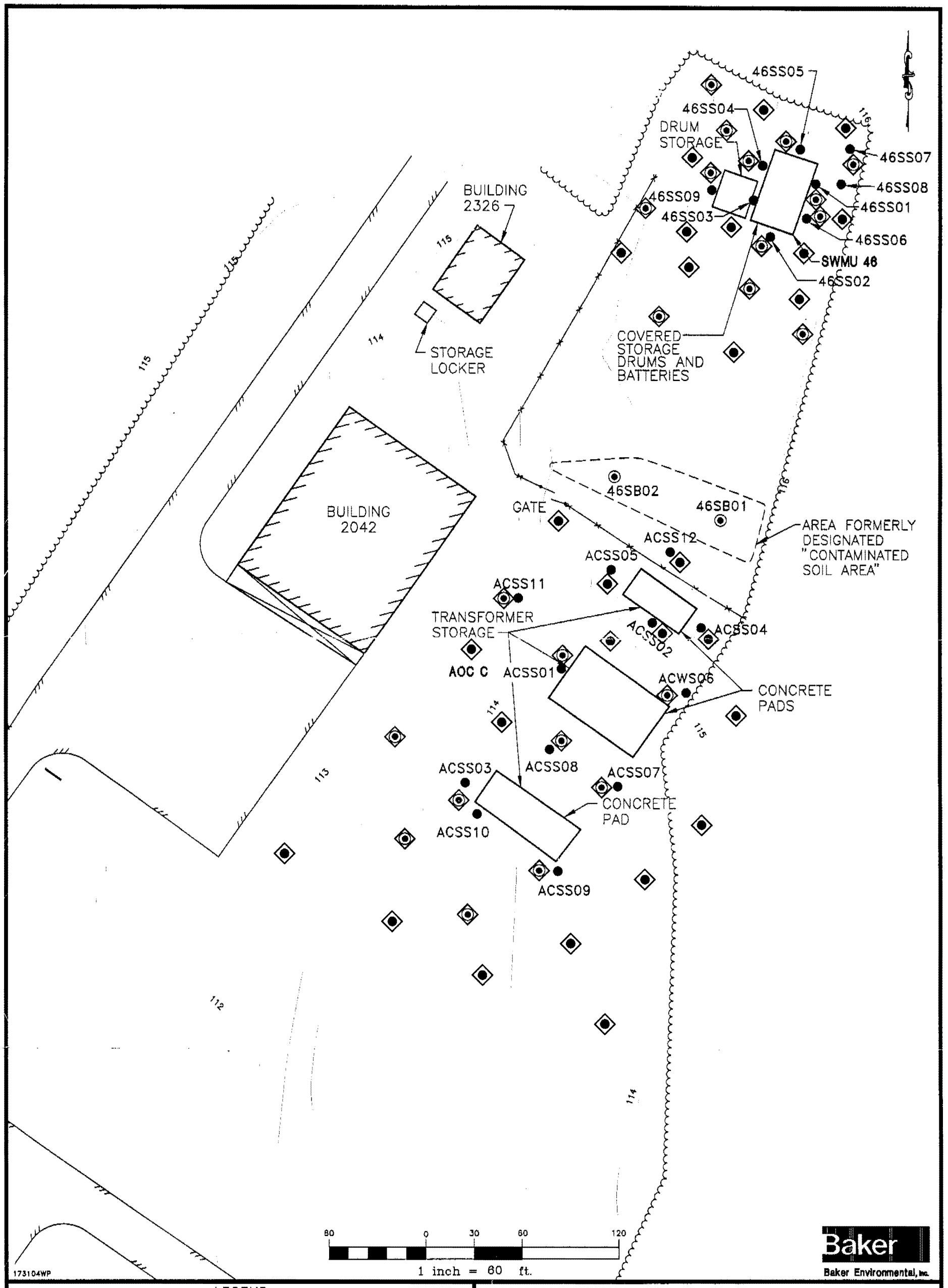
- PREVIOUS SOIL BORING LOCATION
- PREVIOUS SOIL SAMPLING LOCATION
- PROPOSED SOIL SAMPLING LOCATION
- 110 SURFACE ELEVATION CONTOUR

60 0 30 60 120

1 inch = 60 ft.

FIGURE 2–3
PROPOSED ADDITIONAL INVESTIGATIONS
SWMU 31 WASTE OIL COLLECTION AREA
SWMU 32 BATTERY COLLECTION BUILDING 31

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

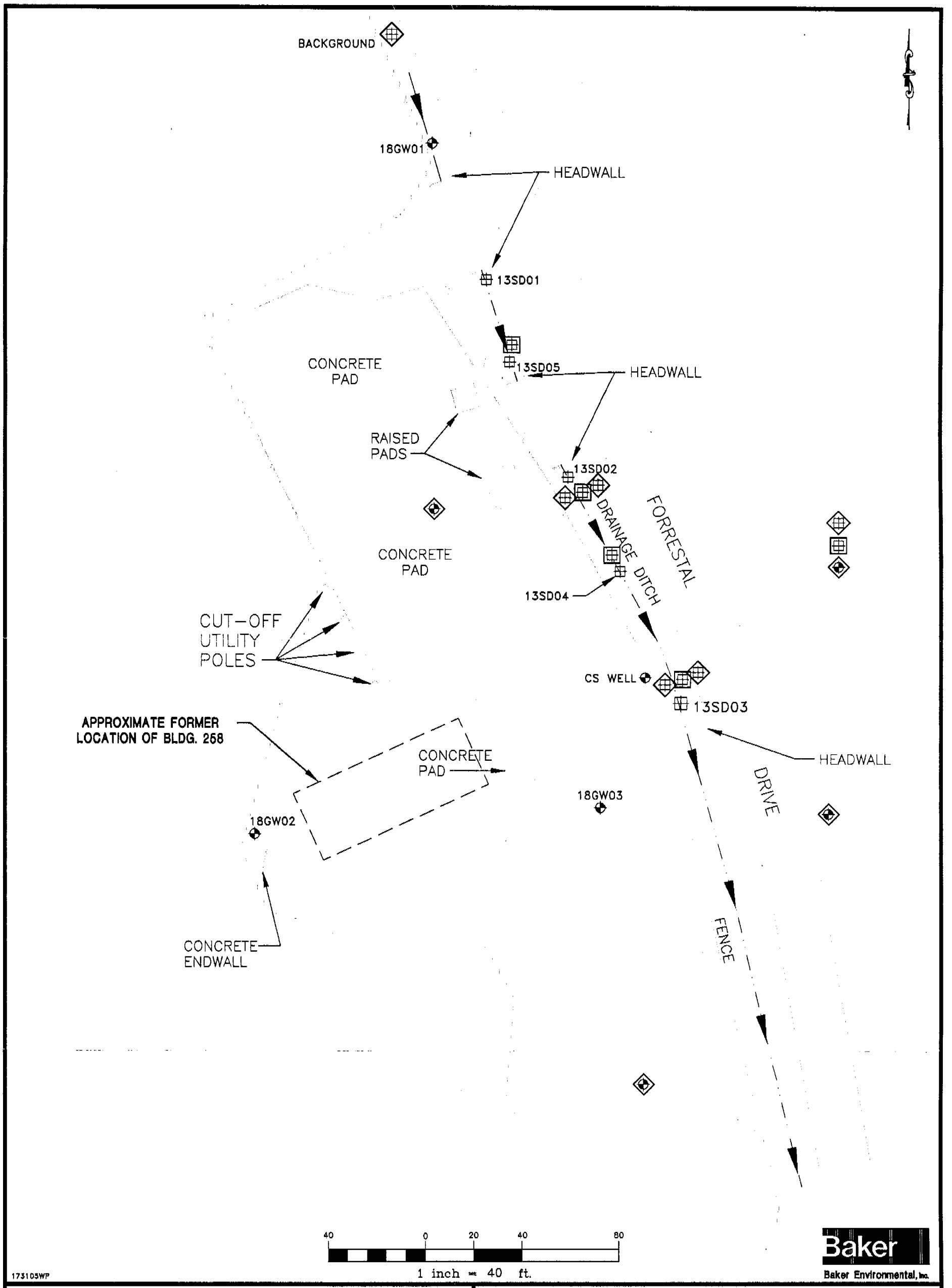


LEGEND

- PREVIOUS SOIL BORING LOCATIONS
- PREVIOUS SOIL SAMPLING LOCATIONS
- PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLING LOCATION
- PROPOSED SURFACE SOIL BORING LOCATION
- 115 SURFACE ELEVATION CONTOUR

FIGURE 2-4
PROPOSED ADDITIONAL INVESTIGATIONS
SWMU 46 POLE STORAGE YARD
AOC C TRANSFORMER STORAGE PAD

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



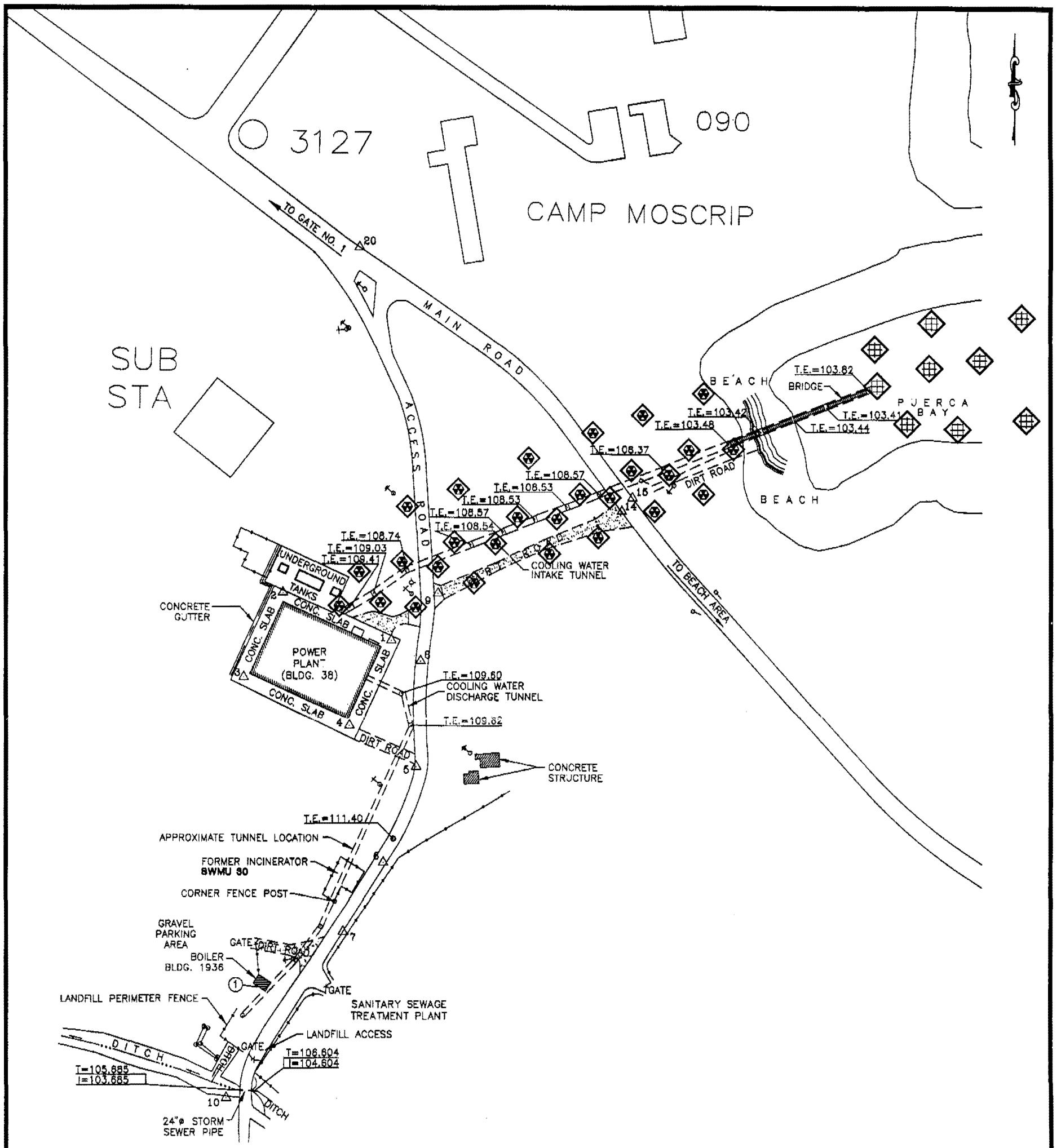
LEGEND

- EXISTING MONITORING WELL LOCATION (CONFIRMATION STUDY)
- PREVIOUS SEDIMENT SAMPLE LOCATION
- PROPOSED SEDIMENT SAMPLE LOCATION
- PROPOSED DEEP SEDIMENT SAMPLE LOCATION
- PROPOSED MONITORING WELL LOCATION
- DRAINAGE DITCH/SURFACE DRAINAGE FLOW DIRECTION

SOURCE: BAKER ENVIRONMENTAL, INC., MAY 1994

FIGURE 2-5
PROPOSED ADDITIONAL INVESTIGATIONS
SWMU 13
PEST CONTROL SHOP AND SURROUNDING AREAS

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



ROOSEVELT ROADS LANDFILL

NOTE: THREE SEDIMENT SAMPLES TO BE COLLECTED IN RADIAL PATTERN AT TUNNEL OUTFALL IN ENSENADA HONDA WHEN LOCATED.

150 0 75 150
1 inch = 150 ft.

173106WP

Baker
Baker Environmental, Inc.

LEGEND

- T.E.=108.54 MANHOLE LOCATION (WITH ELEVATION)
- CHAIN LINK FENCE
- ELECTRIC POLE
- ELECT. POLE WITH TRANSFORMER
- ELECTRIC POLE (CONC.)
- TELEPHONE POLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- CONTROL STATION
- SIGN
- GRAVEL
- PROPOSED GEOPROBE BORING LOCATION
- PROPOSED SEDIMENT SAMPLE LOCATION

FIGURE 2-6
PROPOSED TUNNEL SOILS AND PUERCA BAY SEDIMENT INVESTIGATIONS
RFI-SWMU 11/45

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

APPENDIX A
STANDARD OPERATING PROCEDURE
GEOPROBE®