Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

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FINAL

FOCUSED REMEDIAL INVESTIGATION WORK PLAN

Revision 1
September 28, 2001

ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1 ALAMEDA POINT ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

1230 Columbia Street, Suite 640
San Diego, CA 92101

Lance Humphrey
Senior UXO Supervisor

Abid Loan, P.E.
Project Manager

RESPONSE TO COMMENTS
DRAFT FINAL FOCUSED REMEDIAL INVESTIGATION WORK PLAN
ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION,
AND GEOTECHNICAL AND SEISMIC EVALUATIONS
AT INSTALLATION RESTORATION SITE 1
ALAMEDA POINT
ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

Comments by: EPA Comments: September 21, 2001	Responses by: Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705 Response: September 28, 2001
Specific Comments on Draft Final Focused Remedial Action Work Plan	
Comment 1. Response to General Comment 3: The response indicates there may be a Phase 2 evaluation, however, this is not reflected in the text. Please discuss the potential Phase 2 evaluation in Section 4.5, Geotechnical Investigation, or in an appropriate section.	**Response 1.** Comment noted. Section 1.2.3 on page 1-6 (Seismic Evaluation) in the Site 1 Work Plan describes the Phase 2 evaluation, which will consist of a Newmark-type deformation analysis methods to estimate seismically-induced slope deformations, if the second phase is required.
Comment 2. Response to Specific Comment 4: The document specified in the comment has not been incorporated into the document as promised by the response. Please provide the specific title in the document.	**Response 2.** Comment noted. Specific Comment 4 asks that the fifth bullet in Section 1.2.4 of the Draft Work Plan be amended to reflect that information from the investigative effort be included in the Draft FS. The section was amended as recommended but was renumbered as Section 1.2.5 in the Draft Final version of the document.
Comment 3. Response to Specific Comment 19: ASTM D1587 is not referenced in either the text or in Appendix B, Standard Operating Procedures (SOP)-2 as promised in the response. Please revise the text and SOP-2 to include ASTM D1587 as stated in the response.	**Response 3.** Comment noted, The second sentence in Section 4.5.4, (Drive and Push Samples) page 4-15 states that sampling will be conducted in general accordance with ASTM D-1586, ASTM D-3550-84, and ASTM D-1587-94. The Standard Operating Procedures (SOP-2) have been revised accordingly.

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Comment 4. Response to Specific Comment 21: The response states "Quality Control procedures for the bathymetric survey....and SPT blow counts have been incorporated." Appendix A does not include any quality control (QC) procedures for bathymetric survey other than to specify the coordinate system and reference elevation to be used. There are no QC procedures for the Standard Penetration Tests (SPT) tests. Please include QC procedures for the bathymetric survey and SPT tests as specified in the response.	**Response 4.** Comment noted. The QC procedures will be incorporated into Appendix A as an addendum (Sections 5.7.1.2 and 5.7.1.3, SPT Quality Control and Bathymetric Quality Control, respectively). The QC procedures for SPT tests are described in ASTM D1586-84 and includes: a) Checking the driller equipment and procedures (hammer weight, hammer drop height, sampler dimensions and condition, procedure for counting blowcount, making sure bottom of borehole is relatively free of excessive cuttings before driving the sampler). b) Additionally, CPT test results for CPT soundings performed adjacent to borings provides a cross check of the SPT results using empirical correlation relations.
Comment 5. Response to Minor Comment 3: The response indicates that only one acronym will be used, but the acronym SHSO is still used in Section 3.1.1.4 (and is not defined in the list of abbreviations and acronyms). Please change this acronym as indicated in the response.	**Response 5.** Comment noted. The acronym will be changed to SHSS.
Comment 6. Table 1-1, Data Quality Objectives for Geotechnical Concerns: It is unclear if the historic document review has been completed. Text in Step 3 states that the review has been completed, but the phrase "will determine" in Step 5 implies that it has not been done. Please clarify.	**Response 6.** Comment noted. The historic document review is in progress by the FWENC geotechnical subcontractor. Step 5 in the DQO table has been revised accordingly.

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Comment 7. Table 1-1, Data Quality Objectives for Geotechnical Concerns: Step 3 should specify data to be used and collected rather than general information objectives. Please include date to be used to make decisions in Step 3.	**Response 7.** Comment noted. Step 3 has been revised accordingly.
Comment 8. Table 1-1, Data Quality Objectives for Geotechnical Concerns: Step 5 decision rules do not include any criteria for decisions. Please include decisions to be made and restate the decision rules in an if...then format.	**Response 8.** Comment noted. Step 5 has been revised accordingly.
Comment 9. Table 1-1, Data Quality Objectives for Geotechnical Concerns: In Step 7, please discuss sampling design issues. For example, please specify how the transects will be selected for slope stability analysis. Also, please move the last item in Step 3 (Input to the Decisions) because specifying the tests to be done is more appropriate as an Input to the Decision. Please discuss design issues relating to the SPT and geotechnical testing in Step 7. For example, please specify criteria for selecting depths or units for collecting geotechnical samples.	**Response 9.** Comment noted. Step 7 has been revised accordingly.
Comment 10. Table 1-2, Data Quality Objectives for Ordnance and Explosives Concerns: The "Input to Decisions" includes three reports, and does not include the data to be collected. Please include the surface sweep that will be conducted as one of the elements in Step 3: Input to the Decisions.	**Response 10.** Comment noted. Step 3 has been revised accordingly.

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Comment 11. Table 1-2, Data Quality Objectives for Ordnance and Explosives Concerns: In Step 2, the last three decisions are not specifically addressed in the subsequent steps. Please address each decision in each of the subsequent steps.	**Response 11.** Comment noted. The table was amended as recommended.
Comment 12. Table 1-2, Data Quality Objectives for Ordnance and Explosives Concerns: Step 6 states that decision errors will not be established except in the case that ordnance and explosives waste (OEW) is encountered. Decision errors could include a percentage of items that must be detected, and would be verified by a different team conducting a second sweep of some grid areas (similar to the criteria established in Section 6.5 of Appendix A. Please discuss how and when decision errors will be established of OEW is encountered.	**Response 12.** Comment noted. Decision errors are further discussed in Step 6 in the DQO table.
Comment 13. Table 3-1, List of Contacts Involved in the Project: Please include the Alameda Police and Fire Departments in this table. Also, Brad Job has left the Regional Water Quality Control Board; please note this in the table.	**Response 13.** Comment noted. The table was amended as recommended.
Comment 14. Table 4-1, Laboratory Testing and Test Methods: The number in the Approximate Number column was changed but the Total Sample Quality (TSQ) was not revised to reflect the changes in the number of samples. For example, 4 Atterberg Limits tests are specified and each sample requires 1 pound of soil, but the TSQ is only 2 pounds. Please resolve discrepancies in the TSQ for Atterberg Limits, Moisture/Density, Organic Content, Particle Size with Hydrometer, Consolidated, Undrained Triaxial Shear, and Water Contents.	**Response 14.** Comment noted. The table was amended as recommended.

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August 15, 2001 — EPA Comments

Comments by:	Responses by:
Anna-Marie Cook Environmental Protection Agency 75 Hawthorne Street (SFD 8-2) San Francisco, CA 94105 Received 7/15/01	Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705
General Comments on Draft Focused Remedial Action Work Plan	
Comment 1. The Draft Focused Remedial Investigation Work Plan, Revision 0, June 1, 2001, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, California (Work Plan) does not clearly state which issues need to be resolved and what Data Quality Objective (DQO) will be used to resolve those issues. The issues are probably the presence of Ordnance and Explosives (OE), which may cause a threat to some future user of the site and the seismic stability of the entire IR Site 1 along the waterfront. Due to the lack of specified DQOs, there is a risk that: Insufficient data to address the remaining issues for IR Site 1 will be collected, some of the data may not have sufficient quality to be of use to address the issues present at the site, and some unnecessary data will be collected. Please clearly state the issues to be resolved during this investigation and then use the DQO process to select the data to be gathered.	**Response 1.** The 7-Step DQO process has been addressed in the Work Plan (Section 1.2.4, Tables 1-1 and 1-2) to validate the elements, issues, and risks identified.

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Comment 2. A major concern with the Work Plan is that it appears that the OE characterization of the IR Site 1 is to be limited to a surface investigation. The presence or absence of ordnance on the surface will not be a reliable indicator of the potential for OE to be found below the surface. Also, the previous investigative work indicated that a potential for subsurface OE in the area existed, and that further characterization of the site would be required. The recommendations from previous work suggested intrusive investigation of selected geophysical anomalies identified during the previous investigative work. This issue is not addressed in the Work Plan and could ultimately result in a failure to remove hazardous OE from the site that could pose a potential threat. Please consider investigating the geophysical anomalies so that the potential for subsurface OE can be assessed and revise the Work Plan as necessary.

The Work Plan does not address the potential for encountering OE during the soil boring and test pit excavation activities, nor does it prescribe the precautions to be taken to reduce or eliminate the potential for an OE related incident during these intrusive activities. This omission could result in an increased potential for injury to the individuals performing these intrusive activities. Please revise the Work Plan to specify procedures to clear the test pit and boring locations.

Further, the Work Plan does not specify what sort of notification procedures and under what sort of time frame will be implemented to inform the regulators, the City of Alameda and members of the community if and when an emergency removal situation arises. In addition, the criteria for establishing that an emergency removal situation exists are not clearly articulated.

Response 2. Research and evaluation of historical data available regarding IR Site 1 does not confirm the presence of buried OEW. Neither of the two key documents available for research (*OU-3 Final Remedial Investigation Report* [TTEMI, 1999] and *Final Initial Assessment Study of Naval Station Alameda, California* [E&E, 1983]) indicates that OEW was ever buried in the landfill. There are indications, however, that fired 20-mm practice rounds were used as concrete aggregate and encased in the cement foundations of the pistol range and other 20-mm practice rounds were entombed in barrels approximately 4 to 8 feet deep in the excavation for the range. Other metal debris which includes airplane engines, automobile parts, and so forth is also reported to have been buried in the landfill. Any geophysical survey of a landfill known to contain a large amount of metal debris would reveal a multitude of anomalies. An earlier survey of the pistol range area (where barrels are known to be buried) achieved those exact results. Therefore, presence of anomalies was not considered a confirmation that buried OEW may be present.

Additionally, a 4-foot thick landfill soil cap will be installed at IR Site 1, which will meet "Surface Recreation" use requirements per DoD 6055.9-STD. The main purpose of the OEW investigation is to ensure future-grading operations to install the cap can proceed safely.

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	With no indication of buried OEW and the plan to install a 4-foot topsoil cap on Site 1 in place, a geophysical survey and subsequent intrusive investigation are not planned for the site. Encountering OEW during test pit and soil boring activities was not a consideration for the site. Concerns for drill/backhoe damage from encountering dense metal deposits known to exist in the landfill will require searching and clearing test pit/borehole locations with metal detecting equipment. Should OEW be encountered that is unsafe to move or transport, the EOD Detachment at Travis AFB will conduct an emergency response. OEW encountered that can be moved will be stored in Magazine M353 until investigative activities are completed. It will then be packaged, manifested, and transported to Crane Division, Naval Surface Warfare Center for treatment. The Work Plan will be expanded to explain this. The Work Plan will be expanded to include notification procedures for the Alameda Police and Fire Departments and appropriate regulatory personnel should the situation arise where an emergency response is required.

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Comment 3. The Work Plan proposes assessing the shear strength of two samples using unconsolidated, undrained (UU) triaxial shear tests and collecting blow counts from split spoon sample collection. It is not clear how the UU triaxial shear strength results will be used or what these values will represent. Shear strengths of saturated cohesive soils should be determined using consolidated-undrained triaxial testing (usually with pore pressure monitoring) rather than unconsolidated-undrained triaxial testing. (Reference United States Army Corps of Engineers (USACE) guidance for conducting seismic slope stability analyses (Hynes, M.E. and Franklin, A.G., 1984, Rationalizing the seismic coefficient method: U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi, Miscellaneous Paper GL-84-13, July 1984.) Collection of data from a set of three borings laid on a line perpendicular to, and intersecting, the western shoreline of IR Site 1 was proposed in the focused Work Plan. However, it is not clear why these three borings were placed on a line (potential failure surface?). Further, the Work Plan does not explain why this particular section was selected. Please revise the Work Plan to address what the most likely critical failure surfaces will be at IR Site 1 and discuss how sufficient shear strength data to assess the stability of these sections under the design earthquake event will be collected.	**Response 3.** Comment noted. The proposed approach is to conduct the seismic hazard assessment in two phases. Phase 1 includes evaluation of the stability of the perimeter dikes using traditional limit equilibrium static and pseudo-static analysis methods (for example, PCSTABL 5M or UTEXAS3 computer programs) and traditional empirical liquefaction evaluation methods using SPT blow count and CPT results (for example, Seed & Idriss, 1971; Robertson and Wride, 1997). For these analyses, depending on possible loading conditions, unconsolidated-undrained (UU), consolidated-undrained (CU), and consolidated-drained (CD) shear strength properties of fine-grained sediments (Bay mud) are needed (USACOE, 2000; Duncan, 1992; Ladd, 1991). These will be obtained from results of field tests (for example, CPT and vane shear) and laboratory UU tests and CU tests with pore water pressure measurements.

	Phase 2 evaluations, if needed, will use Newmark type deformation analysis methods (for example, Makdisi and Seed, 1978) to estimate seismically-induced slope deformations. Slopes with estimated large deformations will be identified for further sophisticated analysis or for providing mitigation alternatives. Three borings on a line are needed to determine the geologic cross-section used in the stability analyses. Two borings are not sufficient because conditions change rapidly in shallow marine environments. CPT's are also planned and their locations along with four additional borings are shown on Figure 4-2. Determination of the most critical analysis cross-sections will be based on slope geometry, subsurface soil characterization data, and ground water conditions. As part of the Phase 1 work, critical slopes that require additional stability and deformation analysis (slopes with marginal static and/or pseudo-static factors of safety) will be identified for further evaluation in Phase 2. Shear strength data sufficient for feasibility level analyses and evaluations will be determined by field data (CPT, blow counts, and so forth) the laboratory tests proposed in the Work Plan, and by use of published values from similar sites in the San Francisco Bay area.

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Comment 4. The Work Plan indicates that one purpose of the focused remedial investigation is, "The soil/sediment conditions in areas of the steepest slopes will be evaluated relative to liquefaction potential and recorded deformations in historic earthquakes." The steepness of the slopes is only marginally correlatable with the likelihood of slope failure due to liquefaction as any slope will fail if its foundation layer liquefies. Please clarify how the correlation will be done.	**Response 4.** The scope of the proposed work is a feasibility study level assessment of seismic hazards. The assessment will address both liquefaction potential and slope stability due to seismic forces along the entire length of the waterfront dike system. The most critical slopes for analysis will be determined based on the slope geometry, and soil and ground water conditions. In general, steeper slopes have more potential for deformation during an earthquake. Existing information on past slope movements (such as creep) and historic ground and slope deformations due to liquefaction at the site will be used to evaluate the use of residual versus peak shear strength values for slope stability analysis and for site-specific liquefaction evaluation. There is no plan to correlate slope angle with liquefaction potential evaluation. The plan is to identify areas of relatively higher and lower potential for deformation.

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Comment 5. Table 4-1, Laboratory Testing and Test Methods, contains tests (Modified Proctor Compaction Testing, Saturated Hydraulic Conductivity, Atterberg Limits) that are specified for grab samples that will presumably be collected from the existing landfill cover. The purpose of the Modified Proctor Compaction Test is to determine the compaction properties of the material. Please note that conducting two compaction tests on the heterogeneous materials currently present on the landfill is unlikely to yield useful information as the material properties of a non-engineered cover can be expected to vary widely across the landfill. Please explain how the information from the Modified Proctor Compaction Test will be used and why it is appropriate to conduct this test on soil collected from soil borings.. Also, conducting hydraulic conductivity analyses on remolded grab samples of the existing cover will not be representative of the existing cover materials at any location as the existing cover was not engineered and thus is likely to be extremely heterogeneous. Please revise the Work Plan to take into account the heterogeneous nature of the cover and how the test can accommodate this situation. Note that use of the DQO process would facilitate selection of appropriate tests and would also facilitate elimination of unnecessary tests.	**Response 5**. The laboratory testing of existing cover materials will focus on evaluating in-situ density/moisture content and index properties. Samples of the most common soil types observed will be used for testing. The Modified Proctor compaction and triaxial permeability tests will be performed if existing cover soils are determined to contribute significantly to the hydraulic performance of the final cover system. This is determined based on the results of the field tests and laboratory in-situ density/moisture content and index property measurements. These tests, if needed, will be performed on four composite specimens obtained by mixing soil samples generally representative of predominant near-surface soil conditions at the site to provide average hydraulic conductivity properties of the existing cover soils. The saturated hydraulic conductivity tests will be performed on soil samples with densities simulating the estimated "in-place" (average existing) and "after-compaction" (foundation layer for a new cover) conditions. These tests are only performed if determined useful by the project geotechnical engineer after reviewing the results of moisture/density and index property tests. Additionally, the Modified Proctor test data might be used in the future to evaluate properties of on-site soils that may be excavated and re-compacted as part of a cleanup remedy. The Modified Proctor and hydraulic conductivity test data might also be needed in future for design of the final cover system. Table 4-1 has been revised to reflect this approach.

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Comment 6. Please take into consideration that, since it is not known what contaminants are in the existing cover material, how much waste there is, when waste will be encountered beneath the existing cover, or if OE will be encountered in the existing cover, it may be dangerous to dig up the existing cover materials.	**Response 6.** Comment noted. Subsurface OEW in IR Site 1 was not a consideration for test pit and soil boring activities, however, metal avoidance procedures for screening and clearing test pit and borehole sites to prevent damage to the equipment were incorporated in the Work Plan. The Monitoring Strategy for hazardous materials and flammable vapors or gases is addressed in the Health and Safety Plan.
Comment 7. It is possible that collecting soil samples from a known IR site with potentially high levels of contamination present, and sending these samples without characterization of the contamination to a soils laboratory for geotechnical analyses, may result in unnecessary risk to the health of geotechnical laboratory staff. Geotechnical analyses require considerable manipulation of the soil samples with possibilities of volatilization of contaminants and skin contact with contaminants. Also, if the geotechnical laboratory is unaware of the source and characterization of these samples it is possible that hazardous materials may be handled and disposed of improperly.	**Response 7.** Comment noted. As a determining factor to award a geotechnical laboratory, the lab must be equipped to manipulate samples of potentially high levels of contamination. As part of the bidding process, we shall provide a list of contaminants of concern based on previous environmental data already obtained from the site. PID/FID readings shall also be provided to the laboratory to update the environmental characterization of the soil.
Comment 8. Please revise the Work Plan to include a figure showing the extent of the area under investigation, including the extent of the bathymetric survey.	**Response 8.** Comment noted. Please refer to Figure 4-2 for the area under investigation. It also includes the extent of the bathymetric survey.

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Specific Comments on Draft Focused Remedial Action Work Plan

Comment 1. Executive Summary, Page i: Please specify the purpose of the visual scan of the surface of IR Site 1 for OE and explain why a visual inspection of the site surface is all that is required to clear this site of OE. EPA is concerned about how the potential for OE below the surface will be addressed. Also, please discuss how and when the anomalies detected during previous OE work will be addressed. In addition, please specify in the last sentence of the first paragraph on this page, that it is anticipated that no further action *for UXO* will be required at this site after completing the investigation, characterization and implementing any required removal action.	**Response 1.** The main purpose of the OEW investigation will be to locate, identify, and remove, if necessary any OEW encountered, so that future grading operations to install the cap can proceed safely. Research and evaluation of historical data available regarding IR Site 1 does not confirm the presence of buried OEW. Neither of the key documents available for research (*OU-3 Final Remedial Investigation Report* [TTEMI, 1999] and *Final Initial Assessment Study of Naval Station Alameda, California* [E&E, 1983]) indicates that OEW was ever buried in the landfill. There are indications, however, that fired 20-mm practice rounds were used as concrete aggregate and encased in the cement foundations of the pistol range and other 20-mm practice rounds were entombed in barrels approximately 4 to 8 feet deep in the excavation for the range. Other metal debris which includes airplane engines, automobile parts, etc. are also reported to have been buried in the landfill. Any geophysical survey of a landfill known to contain a large amount of metal debris would reveal a multitude of anomalies. An earlier survey of the pistol range area (where barrels are suspected to be buried) achieved those exact results. (SSPORTS, 1999) Therefore, presence of anomalies was not considered a confirmation that buried OEW may be present. Additionally, a landfill soil cap will be installed at IR Site 1 at a minimum depth of 4 feet which is an appropriate remediation depth for "Surface Recreation" use per DoD 6055.9-STD. The last sentence of the first paragraph of page i will be amended as recommended.

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Comment 2. Section 1.2.1, OE Characterization, Page 1-4: It is important the OE reconnaissance/ surface sweep be conducted before any intrusive method of vegetation removal is done. If it is necessary to furrow or grub, OE should first be cleared to a depth 1 foot deeper than the depth of furrowing or grubbing to ensure that furrowing or grubbing do not cause OE to detonate. Please revise the Work Plan to require the OE reconnaissance/ sweep be completed before vegetation is removed by intrusive methods.	**Response 2.** The vegetation on IR Site 1 will be cut to a height of 4 inches (or less) to facilitate the visual surface OEW investigation. Intrusive methods for vegetation removal will not be used. UXO technicians will proceed in front of the mowing equipment to ensure OEW is not encountered. This will be better explained in the Work Plan.
Comment 3. Section 1.2.2, Geotechnical Evaluation, Page 1-4: On page 1-4 the text in the first bullet indicates that bearing capacity of the existing cover materials at the site are of interest. Please explain why it is of interest and what tests will be performed to determine the bearing capacity.	**Response 3.** Bearing capacity of existing cover is not of primary interest at this time. However, evaluation of bearing capacity of landfill cover and underlying waste material might be of interest for future site-specific foundation design projects or operation of heavy construction equipment on the landfill.
Comment 4. Section 1.2.4, Document Preparation, Page 1-6: Please update the fifth bullet to reflect that information yielded from this investigative effort will be included as part of the Draft FS for IR Site 1	**Response 4.** Comment noted. The Work Plan will be adjusted accordingly.

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Comment 5. Figure 2-1, Page 2-2: This figure depicts an area at the western-most edge of the landfill that is labeled "explosive demolition site". EPA is unable to determine the source of this figure or the information that led to placing a demolition site within the hazardous waste landfill. It seems to contradict the information contained in Figure 3 on page WP-6 in the report "Draft Unexploded Ordnance Investigation Construction Work Plan" submitted by Roy F Weston on May 31, 2000 and within the report "Unexploded Ordnance, Emergency Removal Action, IR Site 1" submitted by SSPORTS Environmental Detachment, Vallejo on December 4, 1998. If the demolition site was in fact within the landfill, a detailed explanation of how the removal action was performed is necessary in order to ensure that debris from the landfill was not scattered in the process and that other safety factors were considered.	**Response 5.** Comment noted. The explosive demolition site will be removed from Figure 2-2. Open Detonation (OD) Blow-In-Place (BIP) procedures will only be used by responding EOD personnel for encountered OEW that is unsafe to move. Engineering controls will be used to mitigate the spread of dust and soil-based contaminants if BIP procedures are used. The type of engineering controls used are situation-dependant and will be determined by responding EOD and FWENC UXO personnel.
Comment 6. Section 2.3, Pistol Range, Pages 2-1 and 2-3: The paragraph that discusses the activities performed at the Pistol Range states that "20 mm aircraft guns were also test fired on the range." Former workers at the site have stated that aircraft guns were test fired into large tanks of liquid as part of aircraft rework operations and these tanks were subsequently buried in the landfill. Please resolve and explain the apparent discrepancy in the origin of the 20 mm projectiles in the landfill.	**Response 6.** Comment noted. A review of more historical archive data indicates that 20-mm practice projectiles were entombed in barrels 4 to 8 feet deep in the pistol range excavation or used for cement aggregate and encased in the cement range foundations. There is no indication that 20-mm cannons were ever test fired on the range. The text will be amended to reflect this.

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Comment 7. Section 4.2, Surveying and Site Control, or Section 4.3, OE Characterization/ Removal Action: The procedures to be followed for the geophysical survey are missing. Please specify the instruments to be used, how data will be recorded, frequency of measurements and procedures to be followed (including data processing) for the geophysical survey in one of these two sections.	**Response 7.** Comment noted. There is no geophysical survey planned for IR Site 1. All references to Geophysical engineers will be removed from the text.
Comment 8. Section 4.2.1, Exclusion Zone, Page 4-3: The Navy indicates that a 4,000-foot exclusion zone would be required if ammunition of 5-inch or greater caliber was detected. A 4,000-foot exclusion zone may encompass a portion of the Port of Oakland, especially if the OE were found in the northern portion of IR Site 1 and had to be blown in place. How would the evacuation of the Port of Oakland be accomplished?	**Response 8.** Comment noted. If OEW was encountered that required a 4,000-foot exclusion for BIP procedures, the Alameda and Oakland Police Departments would be called upon to complete the evacuation. There is very little potential for this situation to arise; this is a worst-case scenario that would only occur if OEW encountered was of such a size that the 4,000-foot exclusion zone was absolutely necessary and no engineering controls were used to mitigate the fragmentation.
Comment 9. Section 4.2.4, Bathymetric Survey, Pages 4-6 and 4-7: In the last bullet on page 4-6 and in the first paragraph on page 4-7, it is unclear whether the elevation of the recording tide gauge and tide staff will be surveyed. The elevation of the measuring reference point for each piece of equipment must be surveyed to Mean Sea Level, North American Datum, 1988 to coincide with the datum selected for the survey.	**Response 9**. Comment noted. Both the tide gauge and staff will be surveyed into the project datum. The Work Plan will be amended to reflect this. The maps will be produced in NAVD 1988. Conversions from NAVD 1988 to NGVD 1929 and MLLW will be listed on the drawings.

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Comment 10. Page 4-7: In the second bullet on page 4-7, it is unclear how much data will be collected during the survey. Please specify the distance between survey points, or specify that survey data will be recorded continuously.	**Response 10.** Comment noted. The echo sounder, DGPS (at a minimum), and usually a tide gauge and compass all plug into the computer for data collection. At a standard survey speed of 3-4 knots, we typically collect 4 soundings per foot along the tracklines. During the editing procedure, we generally reduce this to 1 sounding every 2 feet. This allows us to detect relatively small features, if a trackline passes over the feature. This is considered to be a massive amount of data. Page 4-7, Section 4.2.4 notes that the survey lines will be oriented on 50-foot intervals. Tie lines will be spaced on 100-foot spacings from the shoreline to the offshore limit of the survey area. On a typical, natural shoreline, we can generally assess if there may be features that will be less than 50 feet and adjust line spacing accordingly.
Comment 11. Section 4.3, OE Characterization/Removal Action, Page 4-8: It is important the UXO reconnaissance/surface sweep be conducted before any intrusive method of vegetation removal is done. If it is necessary to furrow or grub, OE should be cleared to a depth 1 foot deeper than the depth of furrowing or grubbing. Please revise the Work Plan to require that the OE reconnaissance/ sweep be completed before vegetation is removed by intrusive methods. It is unclear whether all of IR Site 1, including the runway and the area east of the runway will be included in the OE characterization. Please discuss the extent of the OE characterization, including whether the runway and the area east of the runway will be included.	**Response 11.** Comment noted. The vegetation on IR Site 1 will be cut to a height of 4 inches or less. UXO Technicians will proceed ahead of the mowing equipment to ensure surface OEW does not come in contact with the equipment. This will be clarified in the Work Plan. All of IR Site 1, including the runway and the areas east of the runway will be included in the surface OEW investigation. The area to be investigated can be found in Figure 2-1 of the Work Plan.

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Comment 12. Section 4.5, Geotechnical Investigation, Pages 4-9 and 4-10 and Section 4.5.2, Test Pit Activities, Pages 4-12 and 4-13: It is unclear whether buried OE is likely to be present in areas where the test pits and borings will be completed. If OE could be present in these areas, it would be advisable to have OE specialists and geophysicists check each area before drilling or excavation begins. In addition, as soil is removed from a test pit, the pit should be rechecked after 1 or 2 foot lifts. Please discuss the potential for buried OE and revised the focused Work Plan as necessary.	**Response 12.** Comment noted. Historical records of waste disposal on IR Site 1 from 1943 to 1956 do not indicate that OEW was ever buried in the landfill. Large, dense metal objects (airplane engines, filled barrels, metal debris) were buried there, however, and metal avoidance procedures will be used to prevent damage to drilling and excavating equipment. Borehole and test pit sites will be cleared of all metal prior to the start of activities. Test pit soil will be checked for metal and removed in 1-foot lifts, and boreholes will be checked for metal every 4 feet.
Comment 13. The Work Plan indicates that borings will be advanced to 20 feet below the ground surface or sediment water Section 4.5, Geotechnical Investigation, Page 4-10: interface. Please revise the Work Plan to provide the justification for this depth. Please note that the justification needs to address the depth of the critical slope stability surface and the depth to which liquefaction is known to be a problem (50 feet below the ground surface).	**Response 13.** Initially, each boring will extend at least 50 feet into soil or sediment to confirm drilling into native soil based on the existing information on the site soil stratigraphy (TtEMI, 1999), depth of potential failure surfaces evaluated in slope stability analyses, and the maximum depth for manifestation of liquefaction effects on ground surface (generally known as 50 feet). The Work Plan is revised to include the justification for selected minimum soil boring depths as discussed here.
Comment 14. Section 4.5.1, Soil Boring Activities, Page 4-10: Please provide more detailed instructions for abandoning bore holes than the seventh bullet on page 4-10. Please include detailed instructions for using a tremie pipe to inject cement grout under pressure from the bottom of the borehole.	**Response 14.** Comment noted. Borehole abandonment shall be performed according to the Water Well Standards: State of California, Bulletin 74-81, December 1981, p. 68 (Sealing Methods), which states "...the seal is placed in the annular space by gravity through a grout pipe (or tremie) suspended in the annular space." This section then details the procedure for performing the grout pipe method.

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Comment 15. Section 4.5.1, Soil Boring Activities, Page 4-11: The text in the fifth bullet on page 4-11 indicates that odors, if any, will be identified and noted on the boring logs. Encouraging site workers to use their senses of smell for investigative purposes should be discouraged as many volatile chemicals are hazardous at levels below the odor threshold and some volatile chemicals (for example, hydrogen sulfide) are both rapidly desensitizing and lethal at low concentrations. A monitoring instrument like an OVM should be used. Please revise the Work Plan to indicate that if any odors are detected, site personnel will take appropriate precautionary measures. Also, please discuss how the presence of methane and other landfill gases will be monitored and if this information will be recorded on boring logs.	**Response 15.** Odors shall be described and noted on the boring logs according to ASTM D2488. Please refer to our Site-Specific Health and Safety Plan, Section 7.2 (p 7-2), which states that before and during drilling activities, the FID or PID shall be used at all times.
Comment 16. Section 4.5.1, Soil Boring Activities, Page 4-11: The text of the sixth bullet on page 4-11 indicates that an organic vapor analyzer (OVA) will be used to screen soil samples collected from borings and trenches. The Quality Control Plan in Appendix A of the Work Plan does not discuss how this OVA will be calibrated. Please revise the Work Plan to provide specific, detailed, instructions for use and calibration of any site monitoring equipment used during the field work.	**Response 16.** Please refer to Section 7.3.1 Calibration and Maintenance Procedures in the Draft Site-Specific Health and Safety Plan dated March 30, 2001 for PID calibration. Specific instructions shall be followed according to the manufacturer's guidelines specific to the instrument used.

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Comment 17. Section 4.5.2, Test Pit Activities, Page 4-12, first paragraph: Please clarify the second sentence to indicate whether test pits in landfill cells will only be excavated to a depth of two feet instead of four feet or if the intent is only to provide information about the thickness of the cover or landfill. Useful information can often be conveyed using photographs of test pit side walls, but photographing the test pit walls is not specified. A camera will be on site to record pre- and post- excavation conditions, so the test pit walls could easily be photographed. Neither this section nor Section 4.5.4 (Sampling Procedures) specify how samples will be collected. This information is not included in Appendix B. For example, it is unclear whether samples will be collected from the backhoe bucket or from the sides or bottom of the trench using a hand auger or slam bar. Please discuss how samples will be collected and specify the equipment required for sampling. Also please note that the plan specifies that a grain size distribution for each layer will be recorded in the field notes; this will require the logger to physically examine discrete samples from each layer. Please discuss how the samples for the grain size distribution will be collected, and how the sample collection will be done to ensure that each sample only represents one layer.	**Response 17.** Comment noted. The intent is to only provide information regarding the thickness of the landfill cover. Post-activity photographs of the test pit activities include photographing the test pit walls for documentation. Samples shall be collected from the backhoe bucket. Section 4.5.2 states that field personnel shall not enter the test pits. Bulk samples per soil type shall be classified according to ASTM D2487 and D2488. Only homogeneous samples shall be sampled at 2-foot vertical intervals.

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Comment 18. Section 4.5.3, Exploration Termination before Reaching Planned Depth, Page 4-13: The text states that boreholes and test pits will be backfilled with soil cuttings if an obstruction prevents advancement. Boreholes should be abandoned with cement bentonite grout as specified in Section 4.5.1.	**Response 18.** Only shallow test pits above the water table will be backfilled with cuttings. Boreholes shall be abandoned according to the *Water Well Standards: State of California*, Bulletin 74-81, December 1981, Section 23 (Requirements for destroying wells), which specify requirements to be observed when encountering various conditions of exploratory borings/test pits and how the annular space must be sealed.
Comment 19. Section 4.5.4, Sampling Procedures, Page 4-14: Section 4.5.4 indicates that drive sampling will be conducted in accordance with ASTM D-3550-84 (Standard Practice for Ring-Lined Barrel Sampling of Soils), whereas Appendix B, SOP 2 indicates drive sampling will be conducted in accordance with ASTM D1586 (Penetration Test and Split-Barrel Sampling of Soils). The former is suitable for collecting undisturbed soil samples for shear strength testing and the latter is suitable for assessing liquefaction potential, so both types of tests are probably needed. However, the samples for analysis for shear strength should be collected in accordance with ASTM D 1587-94 (Standard Practice for Thin-Walled Tube Geotechnical Sampling of Soils).	**Response 19**. Comment noted. Both Standard Penetration Test (SPT) and ring samplers will be used. We agree that fine-grained samples for shear strength testing should be collected by Thin-Walled Tubes in accordance with ASTM Test Method D 1587. In addition to recording blow counts, coarse-grained samples for liquefaction evaluation should be collected by SPT Sampler in accordance with ASTM Test Method D 1586. Appendix B and main text will be revised to match.

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Comment 20. Section 7.4.1, Waste Characterization, Page 7-3: The Work Plan indicates that borings will be installed through the landfill and that soil cuttings will be generated from these borings. The Work Plan also indicates that these materials will not be characterized, and is vague regarding disposal of these drill cuttings. Please revise the Work Plan to provide justification for not characterizing the boring soil cuttings and state explicitly how these cuttings will be disposed.	**Response 20.** Comment noted. Soil cuttings and excavated materials will be stockpiled adjacent to their point of origin. These materials will eventually be re-graded into the soil surface upon subsequent land reuse and development. The designation of IR Site 1 as an area of contamination (AOC) allows the placement of material generated during investigations within the same AOC without triggering land disposal restrictions.

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Comment 21. Appendix A: The quality control plan appears to be a boilerplate from some previous project (one that required shop drawings, construction drawings, material samples, mix designs, as-built drawings, liner devices, paint, O&M manuals, on-site mobile laboratories, specifications, spare parts, et cetera) and does not pertain specifically to the work at IR Site 1. Please delete the unnecessary drawings, mixes, material samples, paint, spare parts, on-site mobile laboratories, etc. Also included in Section 2.4 (UXO QC Engineer), is a requirement for conducting a three-phase control process for geophysical teams, although no OE related geophysical activities are prescribed by the Work Plan. Please explain this discrepancy and also revise the quality control plan to include quality control procedures for assuring that the bathymetric survey and OE visual sweep are conducted in accordance with the Work Plan. Please revise the Work Plan to include detailed quality control procedures to assess the quality of the standard penetration test (SPT) blow counts. These blow counts, which are the only data to be collected in accordance with the Work Plan for the assessment of liquefaction potential, require very careful quality control as SPT blow counts are sensitive to the procedures used to conduct the test.	**Response 21.** Comment noted. Quality control procedures for the bathymetric survey, OEW sweep and SPT blow counts have been incorporated. SPT procedures will be in accordance with ASTM Test Method D 1586, which dictates procedures to ensure quality control. Also, the HSA drill rigs to be used are equipped with automatic hammers that provide control over driving forces and number of blows to ensure test results consistent with industry standards. Furthermore, cone penetrometer testing (CPT) is planned. The CPT provides information that correlates to blow counts and provides a cross check on adequacy of SPT blow counts. For quality assurance, two CPT's will be advanced near two borings to check CPT test results (soil stratification and penetration resistance) against boring logs information. CPT soundings will be performed in accordance with ASTM Test Method D 3441.
Comment 22. SOP-1, Section 2.0, Scope, Page 2-1: Please expand this section to better describe the scope of the Ordnance and Explosives/Unexploded Ordnance Disposal activities to be performed in support of the basic plan.	**Response 22.** Comment noted. This SOP will be revised to provide procedures for notifying the designated EOD unit for emergency response (OEW unsafe to move), and for packaging/shipping procedures for OEW that is safe to move and transport.

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Minor Comments on Draft Focused Remedial Action Work Plan	
Comment 1. Section 1.2.2 indicates there will be six borings, Section 4.5 and Figure 4-1 indicate there will be 8 borings, although Section 4.5 also indicates there will be two transects consisting of three borings each. Please resolve this discrepancy.	**Response 1.** Comment noted. The text shall be revised accordingly. There will be a total number of 10 borings, five onshore and five offshore (see Figure 4-2).
Comment 2. Section 1.2.3, Seismic Evaluation, Page 1-5, paragraph 2, sentence 4: Please substitute the word "existing" for "exiting" in the phrase "if exiting CPT tests..."	**Response 2.** Comment noted. The text shall be revised accordingly.
Comment 3. In Section 3.1.1.4 (Page 3-3) two different acronyms, SHSS and SHSO, are used to describe the same position. Please use one acronym or clarify the difference between the two acronyms/positions.	**Response 3**. Comment noted. One acronym will be used for the position.
Comment 4. Section 4.3 (Page 4-8) indicates that all vegetation will be completely removed while Section 1.2.1 (Page 1-4) indicates it will be mowed to a height of no more than 4 inches. Please resolve this discrepancy.	**Response 4.** Comment noted. The vegetation on IR Site 1 will be cut to a height of 4 inches or less. The discrepancies between the two sections of the Work Plan will be corrected.
Comment 5. Section 4.5 (Page 4-10) references Section 8 for the disposal of investigation-derived waste when it should refer to Section 7. Please correct this citation.	**Response 5.** Comment noted. The text shall be revised accordingly.

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Comment 6. Section 4.5.4 (Page 4-14) indicates the trench grab samples will consist of 20 pounds of soil, Section 4.5.5.2 (Page 4-16) indicates the grab samples will consist 35 pounds of soil. Please resolve this discrepancy.	**Response 6.** Comment noted. The text shall be revised accordingly.
Comment 7. In Section 4.5.6 (Page 4-14), the first sentence is incomplete.	**Response 7.** Comment noted. The sentence will be corrected.
Comment 8. Section 9.0, References (Page 9-1): The correct title for the DDESB is "Department of Defense Explosives Safety Board."	**Response 8**. Comment noted. The title will be corrected.
Comment 9. Grain-size distribution is specified under both soil boring logs and test pit logs. Unless site personnel are using sieves, please change "grain-size distribution" to "observed soil type.	**Response 9**. Comment noted. The text shall be revised accordingly.
Comment 10. BIP is defined as below-in-place in the abbreviations and acronyms list. Please provide the correct definition.	**Response 10.** Comment noted. The definition will be corrected.
Comment 11. Abbreviations and Acronyms list, Page x: The correct title for the DDESB is "Department of Defense Explosives Safety Board."	**Response 11.** Comment noted. The title will be corrected.
Comment 12. SOP-1, Abbreviations and Acronyms, Page iii: The correct title for the DDESB is "Department of Defense Explosives Safety Board."	**Response 12.** Comment noted. The title will be corrected.
Comment 13. SOP-1, Section 4.4, Page 4-3: On page 4-3, in the third bullet, the correct title for the DDESB is "Department of Defense Explosives Safety Board."	**Response 13.** Comment noted. The title will be corrected.

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August 15, 2001 —DTSC Comments

Comments by:	Responses by:
Mary Rose Cassa Office of Military Facilities Department of Toxic Substances Control 700 Heinz Avenue, Suite 200 Berkeley, California 94710-2721 Received on: July 12, 2001	Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705
Specific Comments on Draft Focused Remedial Action Work Plan	
Comment 1. Compliance with California Code of Regulations (CCR), Title 22: While the Navy acknowledges that any OE recovered from this activity is considered RCRA hazardous waste, the Navy is reminded that treatment of hazardous waste via open burning/open detonation (OB/OD); "blow in place) is subject to requirements specified in CCR, Division 4.5, Article 16, Section 66264.600 et. Seq. This includes providing a detailed analysis of potential impacts from OB/OD activities as well as an assessment of treatment alternatives such as contained detonation chamber, offsite disposal, foam tent, engineering controls for detonation. A presumption to use OB/OD cannot be made. While DTSC understands that some items found may need to be detonated in place, the planned nature of the activities nullifies the emergency exemption. Rather, DTSC requires that authority to manage OE be granted through either a permit for onsite storage and treatment of OE or an approved Remedial Action Plan for onsite storage and treatment of OE. If the scope changes (for example, to include subsurface), then DTSC will likely ask for a test bed and broader discussion and effort on quality assurance (including seeding of site)	**Response 1.** Should OEW be encountered that is unsafe to move or transport, the EOD Detachment at Travis AFB will conduct an emergency response. OEW encountered that can be moved will be stored in Magazine M353 until investigative activities are completed. It will then be packaged, manifested, and transported to Crane Division, Naval Surface Warfare Center for treatment. The Work Plan will be expanded to explain this.

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Comment 2. Health and Safety: Concentrations of vinyl chloride and other volatile contaminants at this site have been very high. During drilling and test pit activities, pockets of landfill gas could be encountered. A PID and possibly other onsite detection equipment (for example colorimetric detector tubes) should be used during field activities to ensure that landfill gases will not harm workers.	**Response 2.** Comment noted. Please refer to Section 7.2, p 7-2 in the Site-specific Health and Safety Plan, which states that either a PID or FID shall be used during drilling activities at all times.
Comment 3. Seismic Evaluation/High Potential Ground Movement: The Work Plan indicates (page 1-5) that seismic evaluation will be carried out only if areas of high potential ground movement are identified. Given the seismic nature of the area, the unconsolidated nature of the fill, and the shallow depth of the groundwater, it seems the entire study area is one of high potential ground movement.	**Response 3.** Comment noted. Seismic hazard evaluation will be conducted for the entire site. Preliminary slope stability and liquefaction potential evaluations will determine areas of high potential ground movement, which will be further evaluated in more detail.
Comment 4. Soil Borings and Test Pits: On page 1-5 it is stated that six soil borings and eight test pits are proposed. On page 4-9, however, it is stated that eight soil borings and eight test pits are proposed. It appears from Figure 4-2 that eight hollow stem auger borings will be advanced. Please correct this discrepancy.	**Response 4.** Comment noted. There will be ten hollow-stem borings, five offshore and five onshore. In addition, there will be 14 cone penetrometer testing (CPT) soundings. Figure 4.2 shows the approximate locations. The text has been revised accordingly.
Comment 5. Site History: On page 2-3 it is stated that 20-mm aircraft guns were test fired on the range. Anecdotal information provided to the BRAC Cleanup Team has indicated that the aircraft guns were test fired as part of aircraft reworking operations in Building 5. Please verify this information and correct any inconsistencies.	**Response 5.** Comment noted. Upon review, it appears that 20-mm aircraft guns were fired at locations other than the pistol range. The spent, inert projectiles were collected and transported to the range for incorporation into the excavation and foundations. The text will be amended to reflect this.

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Comment 6. Test Pit Observations: Test pits offer a unique and valuable opportunity to observe the three-dimensional subsurface. The Work Plan states that photographs will be taken to document pre- and post trenching conditions and that maps will be made noting features such as voids, oversized rock, etc. Please consider (1) including photographs of the test pits with the maps and (2) detailed observations of any waste that might be encountered.	**Response 6.** Comment noted. Photographs taken during drilling and test pit excavation activities shall be included in our investigative report. These photos shall detail observations noted during the test pit excavation and drilling activities.
Comment 7. Grouting Operations: Please ensure tremie procedures are used during grouting operations.	**Response 7.** Comment noted. Borehole abandonment shall be performed according to the *Water Well Standards: State of California*, Bulletin 74-81, December 1981, p. 68, which detail use of the tremie pipe.
Comment 8. Project Contacts: Please correct the spelling of the DTSC project contact in Table 3-1 (Mary Rose Cassa).	**Response 8.** Comment noted. The spelling will be corrected. DTSC contact has been changed to Mr. Daniel Murphy.

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August 15, 2001 —RWCQB Comments

Comments by:	Responses by:
Brad Job California Regional Water Quality Control Board San Francisco Bay Region 1515 Clay Street, Suite 1400 Oakland, California 94612 Received on: July 16, 2001	Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705
Specific Comments on Draft Focused Remedial Action Work Plan	
Comment 1. Anecdotal information regarding construction practices employed by the Navy at the time the IR Site 1 Landfill was constructed indicate that sunken vessels or barges may have been used to construct a portion of the perimeter of the landfill. Based on personal observations of breakwaters and jetties of similar vintage, this appears to have been a common practice. We are concerned about the long-term stability of the waste in the landfill if sunken vessels do in fact comprise a portion of the landfill perimeter. Please confirm if the proposed geotechnical investigation is capable of identifying the presence of voids within potential sunken vessels. If the proposed investigation is not capable of identifying potential voids, please produce alternative investigative measures or state conclusively that this uncertainty cannot be reduced.	**Response 1.** Comment noted. It is true that old WWI ships were used to fortify dikes at various locations on the San Francisco Bay and old aerial photos indicate some ships may have been used at Alameda. The ships used were typically destroyer class ships in excess of 300 feet. Our field investigation program includes borings approximately every 300 feet along the perimeter dike. It is very unlikely that any buried ships will be missed. Furthermore, additional research will be conducted to determine if buried ships were left in place in Alameda. Research may include 1930 vintage aerial photographs. It should also be noted that at least 50 boreholes were drilled along the perimeter dike during previous investigations at the site. No buried ships were encountered during these investigations.

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 06CA.RW/1042
27 September 2001

To: Distribution

Subj: FINAL FOCUSED REMEDIAL INVESTIGATION WORK PLAN, REVISION 1, 28 SEPTEMBER, 2001. ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1, ALAMEDA POINT, ALAMEDA, CALIFORNIA.

Ref: (a) Draft Final Focused Remedial Investigation Work Plan, Revision 0, 20 August, 2001. Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, California.

(b) DoN EFANW Contract No. N44255-95-D-6030, DO No. 0095, Engineering Field Activities Northwest Remedial Action Contract for Sites in Southern California, Arizona, New Mexico, and Southern Nevada

Encl: (1) Revision 1 Cover Sheet and Spine
(2) Table 1-1 (Data Quality Objectives for Geotechnical Concerns)
(3) Table 1-2 (Data Quality Objectives for OEW Concerns)
(4) Table 3-1 (List of Contacts Involved in the Project)
(5) Table 4-1 (Laboratory Testing and Test Methods)
(6) Work Plan pages 3-3 and 3-4
(7) Project Contractor Quality Control Plan (text only)
(8) SOP-2 (Drilling, Geotechnical Sampling, and Testing)

1. The following changes to reference (a) are provided. When made, the document will be considered the Final version of the document.

a. Replace the existing cover sheet and spine with those provided in enclosure (1).
b. Replace Tables 1-1 and 1-2 with enclosures (2) and (3).
c. Replace Table 3-1 with enclosure (4).
d. Replace Table 4-1 with enclosure (5)
e. Replace Work Plan Pages 3-3 and 3-4 with enclosure (6)
f. Replace Appendix A (Project Contractor Quality Control Plan) with enclosure (7)
h. Replace SOP-2 (Drilling, Geotechnical Sampling, and Testing) with enclosure (8)

2. Please contact me at (619) 532-0952, with any questions.

Sincerely,

Richard Weissenborn
Remedial Project Manager

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N44255-95-D-6030 (RAC II)

Document Control No. 01-0299 Rev. 1

File Code: 5.0

TO: Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Lovering, 02R1.RL
1220 Pacific Highway
San Diego, CA 92132-5190

DATE: 09/28/01
DO: 0095
LOCATION: NAS Alameda

FROM: Carol Hart (FOR)
Neil Hart, Program Manager

DESCRIPTION: Final Focused Remedial Investigation Work Plan, Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Rev. 1, 09/28/01 (REPLACEMENT PAGES ONLY)

TYPE: ☐ Contract/Deliverable ☒ DO Deliverable ☐ Notification ☐ Other

VERSION: Final (e.g. Draft, Draft Final, Final, etc.) REVISION #: 1

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FINAL FOCUSED REMEDIAL INVESTIGATION WORK PLAN, ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1, REV. 1, 09/28/01

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TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N44255-95-D-6030 (RAC II)

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Southwest Division
Mr. Richard Lovering, 02R1.RL
1220 Pacific Highway
San Diego, CA 92132-5190

DATE: 08/20/01
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EXECUTIVE SUMMARY

This Focused Remedial Investigation Work Plan (RI Work Plan) describes the scope of an ordnance and explosives waste (OEW) characterization, and geotechnical and seismic evaluations at Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of the former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California. The term "characterization" has been used in accordance with requirements established in Department of Defense (DoD) 6055.9-STD which will involve a surface investigation of IR Site 1 to locate and identify OEW. The U.S. Navy (Navy), Southwest Division Naval Facilities Engineering Command (SWDIV), directs these actions in accordance with requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Foster Wheeler Environmental Corporation (FWENC), as the general contractor, is responsible for conducting the investigation. The Navy has determined (upon review of the IR Site 1 operational history and site-specific investigative data) (TtEMI, 1999) that the site contains a mixture of fill material, assorted hazardous wastes, dredge spoils, aircraft engines, paint wastes, cleaning compounds, and construction debris. The proposed investigation does not address chemical contamination, in soil, sediment, or groundwater. The Navy has initiated the planned surface investigation at IR Site 1 to substantially eliminate, prevent, or abate any potential hazards associated with Used and Unused Military Munitions as defined in the Military Munitions Rule (MMR) and associated inert scrap derived from such military munitions (DOD, 1998). A 4-foot landfill cap (either native soil or multi-layer) will be placed on IR Site 1 following OEW, seismic, and geotechnical investigations. It is anticipated that no further action for OEW will be required at this site after completing the investigation. Future land use of IR Site 1 will involve development of a golf course over the soil cap.

IR Site 1 consists of a 40-acre (approximate) area located on the western coastline of Alameda Point, in Alameda, California. The site is relatively rectangular in shape and is bordered on the west and north by San Francisco Bay and the former NAS Alameda on the east and south. IR Site 1 was used as the main disposal area for the former NAS Alameda from approximately 1943 through March 1956. Archival maps and drawings of the area during the 1940s show water as deep as 20 feet at what is now the western shoreline of the site. A rock seawall lies at the northern perimeter of the site and was in place prior to 1915. According to a survey completed by the Navy in 1988, the landfill has no liner, no maintenance was ever performed, and the depth of the waste is unknown.

Between 15,000 and 200,000 tons of waste from the NAS Alameda, Oak Knoll Naval Hospital and Naval Supply Center Oakland was deposited at IR Site 1. Use of IR Site 1 as a landfill was halted in 1956, and the site is currently unused but planned for transfer to the City of Alameda

upon the completion of closure and remediation activities [Supervisor of Shipbuilding, Conversion and Repair, Portsmouth (SSPORTS, 1999a)].

Uninhabited buildings, building foundations, and a former pistol range make up the disturbed areas of the site. Yellow sweet clover, ryegrass, and common plantain are the dominant plant species while feral rabbits are the dominant animal species in the non-disturbed areas of the site.

The pistol range area is adjacent to the coastline in the middle of IR Site 1. The range was formerly used for pistol, rifle, and shotgun practice. An area to the north of the pistol range was used as a disposal site for spent ordnance [20-millimeter (mm), lead bullets, and pellets]. An earthen berm 10 to 15 feet high and lined with sandbags is located behind the firing lines. The pistol range area is approximately 220 feet by 200 feet in size and was in operation from the early 1940s until 1993. Types of weapons used at the pistol range included .22 caliber, .38 caliber, .45 caliber, .357 caliber, .44 caliber, 9 mm, and 12-gauge shotguns, according to archival information. Interviews of previous workers on the Base revealed that during the construction of the pistol range, the area was excavated to a depth of 8 feet to remove buried construction and mechanical debris (that is, fence material and aircraft engine parts). An unknown number of 55-gallon drums filled with fired, inert 20-mm projectiles were reportedly dumped in this excavation and the projectiles were also mixed into concrete used for the pistol range foundations.

Paved runways, roads, and nonnative grasslands comprise IR Site 1, and the area is mostly flat with slight depressions that sometimes flood during the winter rains.

The Navy conducted a remedial investigation (RI) between 1988 and 1995 with oversight from the U.S. Environmental Protection Agency (EPA), the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (RWQCB). Preliminary results indicate that no chemical contamination of soil that exceeds the total threshold limit concentration (TTLC) hazardous levels at IR Site 1 is present, with the exception of the pistol range. However, total lead, cadmium, and zinc concentrations above the California TTLC of 1,000 milligrams per kilogram (mg/kg), 100 mg/kg, and 5,000 mg/kg, respectively, were detected in the pistol range area.

A radiological survey of the area adjacent to IR Site 1 in 1998 by UXO Technicians from SSPORTS, Virginia resulted in the discovery of 335 live 20-mm high-explosive projectiles and two small arms rounds. These OEW were thermally treated (explosive demolition) as a part of an Emergency Removal Action (SSPORTS, 1999c). A geophysical survey of the former pistol range was conducted subsequent to the Emergency Removal Action. The anomalies detected in the survey were not indicative of buried OEW, but were consistent with results expected for any survey of a landfill with known subterranean metal debris.

An offshore bathymetric survey and an upland topographic survey will be performed to Corps of Engineers Class 1 hydrographic survey standards. The geotechnical evaluation will be conducted to identify geotechnical characteristics important for site remediation and also for analysis of future uses at IR Site 1. The field investigations conducted to collect this data will involve drilling soil borings using a hollow-stem auger (HSA) and excavating test pits at IR Site 1. Representative, disturbed, and undisturbed soil samples will be retrieved for geotechnical analyses. No chemical analyses will be performed. Soil conditions change rapidly in near-shore marine environments, therefore, actual soil data will be retrieved. The seismic evaluation will include a review of all existing site information to determine data gaps needed to allow evaluation of seismic hazard exposure.

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ABBREVIATIONS AND ACRONYMS

AFB	Air Force Base
AOC	Area of Contamination
ARAR	Applicable or relevant and appropriate requirements
ASTM	American Society for Testing and Materials
B	borings
BCT	BRAC Closure Team
bgs	below ground surface
BIP	blow-in-place
BMP	best management practices
BRAC	Base Realignment and Closure
BWHSP	Base-Wide Health and Safety Plan
Cal-EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	Chain-of-Custody
CPT	cone penetrometer test
CQC	Contractor Quality Control
CWM	chemical warfare monitoring
D	depth
DDESB	Department of Defense Explosives Safety Board
DERP	Defense Environmental Restoration Program
DGPS	digital global positioning system
DO	Delivery Order
DoD	Department of Defense
DOT	Department of Transportation
DPM	Deputy Program Manager
DQO	Data quality objective
DS	drive sample
DTSC	Department of Toxic Substances Control
ECM	Environmental Compliance Manager
EFANW	Engineering Field Activities Northwest
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency

ABBREVIATIONS AND ACRONYMS
(Continued)

EPP	Environmental Protection Plan
ESA	Endangered Species Act
EZ	Exclusion Zone
FS	Feasibility Study
FWENC	Foster Wheeler Environmental Corporation
GIS	Global Information System
HAI	Hushmand Associates, Inc.
HERO	Hazards of Electromagnetic Radiation to Ordnance
HSA	hollow-stem auger
HSP	Health and Safety Plan
IR	Installation Restoration
IRP	Installation Restoration Program
kW	kilowatt
LDR	land disposal restriction
mg/kg	milligrams per kilogram
mm	millimeter
MMR	Military Munitions Rule
MPM	most probable munition
NAS	Naval Air Station
NAVFAC	Naval Facilities Command
NAVSEA	Naval Sea Systems Command
Navy	United States Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEDTS	Navy Environmental Data Transfer Standards
NWRSA	National Wildlife Refuge System Administration
OEW	ordnance and explosives waste
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OVA	Organic vapor analyzer
PjM	Project Manager
PPE	Personal protective equipment
PQCM	Project Quality Control Manager
PVC	polyvinyl chloride
QC	quality control
QCM	Quality Control Manager

ABBREVIATIONS AND ACRONYMS
(Continued)

RAB	Restoration Advisory Board
RAC	Remedial Action Contract
RCRA	Resource, Conservation, and Recovery Act
RI	Remedial Investigation
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SASW	spectral analysis of surface wave
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
SOP	Standard Operating Procedure
SPT	standard penetration test
SSPORTS	Supervisor of Shipbuilding, Conversion and Repair, Portsmouth
SUXOS	Senior UXO Supervisor
SWDIV	Southwest Division Naval Facilities Engineering Command
TBC	Requirements "to be considered"
TIP	Task Initiation Process
TP	test pits
TSDF	treatment, storage, and disposal facility
TtEMI	Tetra Tech EM, Inc.
TTLC	total threshold limit concentration
USACE	United States Army Corps of Engineers
USC	United States Code
USCS	Uniform Soil Classification System
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordnance
WMM	Waste Military Munitions
WMP	Waste Management Plan

1.0 INTRODUCTION

The Southwest Division Naval Facilities Engineering Command (SWDIV) has authorized Foster Wheeler Environmental Corporation (FWENC) to perform an ordnance and explosives waste (OEW) characterization (investigation), and geotechnical and seismic evaluations of the former solid waste disposal site identified as Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of the former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California (see Figure 1-1). The authorization for this work is issued under Engineering Field Activities Northwest Remedial Action Contract (EFANW RAC II) No. N44255-95-D-6030, Delivery Order (DO) No. 0095, and is being performed under the Defense Environmental Restoration Program (DERP) for Base Realignment and Closure (BRAC). These actions are a critical component of the U.S. Navy's (Navy) Remedial Investigation/Feasibility Study (RI/FS) of the sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), more widely known as "Superfund."

1.1 PURPOSE AND OBJECTIVES

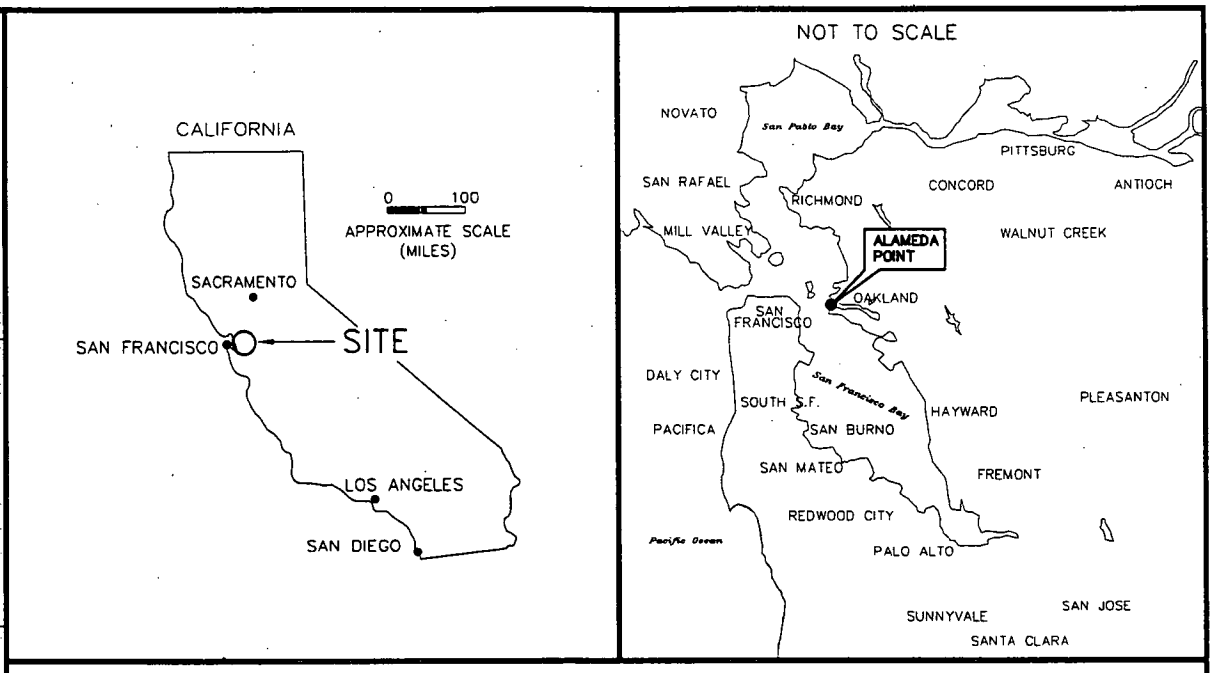
The objective of this action is to complete OEW investigation of IR Site 1 and to complete geotechnical and seismic evaluations of the site. Findings of the evaluations will be incorporated into the RI and FS Reports for IR Site 1. The tasks involved in the completion of this DO for IR Site 1 are summarized below.

1.1.1 Task 1: Review Background Information and Initiate Focused RI Work Plan

The review of existing site information will include available data and results of previous investigations performed at IR Site 1. Potential federal and state, applicable or relevant and appropriate requirements (ARARs) and initial data quality objectives (DQOs) for the work described in the Statement of Work will also be identified as part of the review.

1.1.2 Task 2: Prepare Field Investigation Documentation and Perform Fieldwork

Documents necessary to perform field investigation work will include preparation of a focused RI Work Plan, Health and Safety Plans (HSPs), a Project Contractor Quality Control (CQC) Plan, procedures for geotechnical and seismic sampling and analyses, and development of Standard Operating Procedures (SOPs) for OEW investigation. The fieldwork will be performed in accordance with the requirements of these documents and sampling analyses will be performed by a geotechnical laboratory.



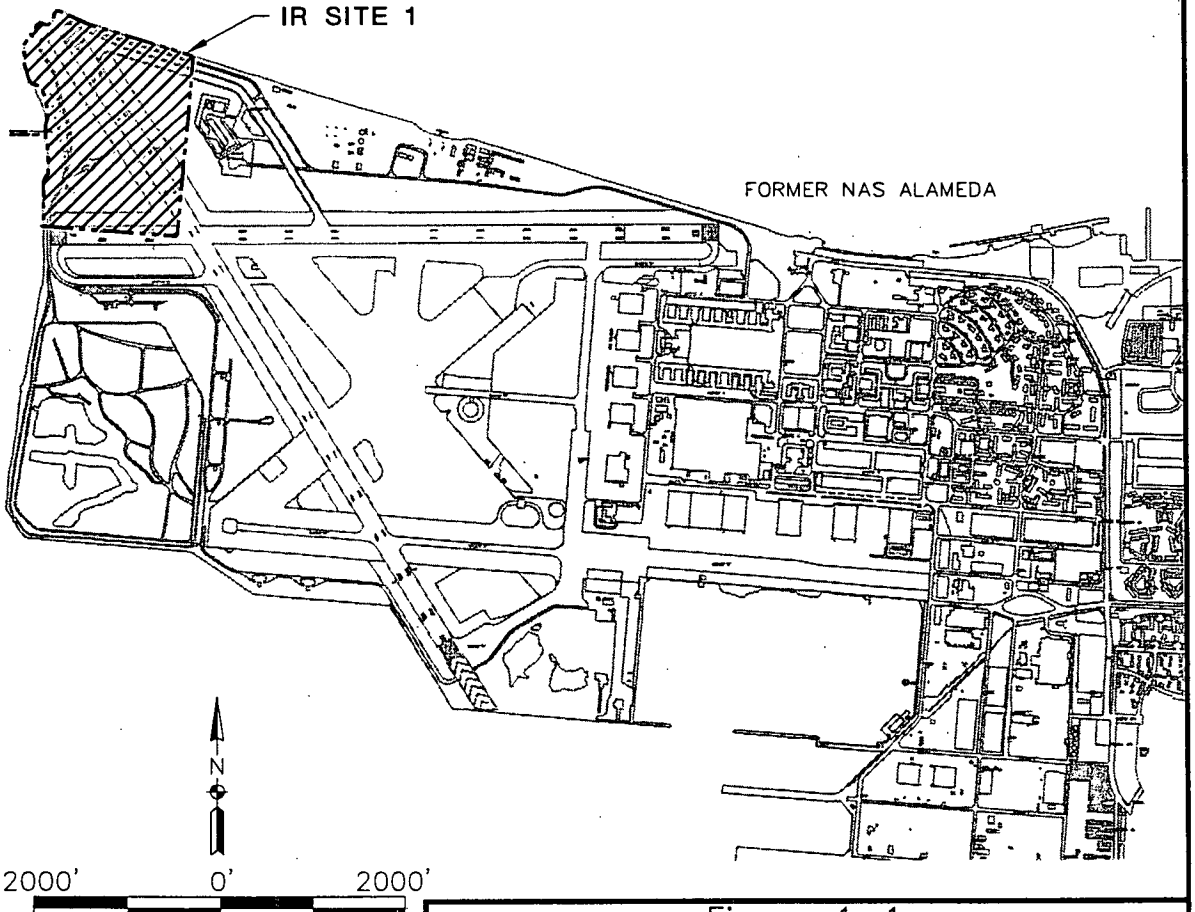


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Figure 1-1
ALAMEDA POINT VICINITY MAP
ALAMEDEA, CA

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Naval Facilities Engineering Command

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1.1.3 Task 3: Geographic Information System Update

Load all new data into the existing site-specific geographic information system (GIS)/database.

1.1.4 Task 4: Prepare Report of Findings

The results of the OEW investigation, and geotechnical and seismic evaluations will be presented in the OU-3 RI Report Addendum, Volume III, which will be prepared by FWENC. The OEW investigation findings will be incorporated into the RI Report, and the geotechnical and seismic evaluations will be incorporated into the FS Report Attachment.

1.1.5 Task 5: Aid in the Preparation of Feasibility Study Report

The FS report will include the development and screening of alternatives and a detailed analysis of alternatives for seismic and/or geotechnical hazards. FWENC will prepare an FS Report Attachment, which will contain information necessary for these analyses.

1.2 SCOPE OF WORK

The scope of work for planned investigation and geotechnical and seismic evaluations at IR Site 1 consist of the following main categories of activities:

- OEW Investigation
- Geotechnical Evaluation
- Seismic Evaluation
- Document Preparation

Brief descriptions of these activities are presented below.

1.2.1 OEW Investigation

Existing historical and archival site information will be reviewed to conservatively estimate the most probable munition (MPM) likely to be encountered during investigation activities and assess the related hazards and safety precautions. A shoreline/upland topographic survey for the site will be performed to provide spot elevations and associated horizontal coordinates for significant features within the limits of the site and to establish a grid network for conducting surface OEW investigation operations. Prior to conducting any field activities, a visual reconnaissance/surface sweep of all support zones, staging areas, and access roads required to support site mobilization, land surveys, geotechnical and seismic investigations will be conducted by UXO personnel to remove metallic debris and any potentially dangerous OEW from the ground surface (FWENC, 1998). Vegetation on the site will be cut to a height of no more than 4 inches to facilitate a surface OEW investigation of the site and provide access for soil sampling activities and test pit excavation. UXO technicians will proceed ahead of the

mowing equipment to prevent encounters with OEW. Depending on the height of the grass and vegetation at the time of mobilization, the cuttings will either be left in place (short growth) or removed and stockpiled on-site (tall growth). A biologist will observe the vegetation removal activities to ensure that the mowing does not affect nesting sites of listed and sensitive species. The topographical features of the site will be evaluated to determine if planned investigation activities require modification.

A UXO removal action and UXO sweep were completed on a portion of Site 1 in 1998. There have been no military activities on the site since then and there is very little potential for discovering additional OEW on the surface of Site 1. If OEW is encountered, it will be dealt with as investigative-derived waste. After determining the status of the OEW by FWENC UXO Technicians, Travis Air Force Base (AFB) Explosive Ordnance Disposal (EOD) personnel will respond if the OEW is not safe to move/transport and poses a threat to human health or the environment. OEW that is safe to move will be placed in Magazine M353 or 354 until the completion of investigative activities, approximately 14 days. The OEW will then be packaged, manifested, and shipped to a treatment facility. All actions taken will comply with state and federal requirements for storing and shipping Resource, Conservation, and Recovery Act (RCRA) hazardous waste.

1.2.2 Geotechnical Evaluation

Geotechnical characteristics that are considered important factors in the geotechnical evaluation are provided as follows:

- Hydraulic performance of existing soil cover over the landfills.
- Settlements of existing cover soil and new fill material placed over the landfills.
- Static and dynamic stability of perimeter dikes along the shoreline, including resistance to wave erosion.
- Integration of future land use over the landfills with the requirement for landfill caps to control site drainage and infiltration.

The data collected to evaluate these characteristics will generally include:

- Thickness and physical properties of existing soil cover over the landfills.
- Groundwater elevations.
- Physical properties of perimeter dikes and offshore sediment parallel to the dikes, including parameters needed for static and seismic stability analyses.
- Accurate topographic survey including existing mudline elevations in the wetlands areas.
- Accurate bathymetric survey data along the shoreline out to a distance of potential sliding or lateral spreading of perimeter dikes.

The field investigations conducted to collect this data will involve drilling soil borings using a hollow-stem auger (HSA) and excavating test pits. A total of ten soil borings and eight test pits are proposed for IR Site 1. Representative, disturbed, and undisturbed soil samples will be retrieved for geotechnical analyses. No chemical analyses will be performed.

The shoreline survey will extend from the high water line to 500 feet offshore. Survey lines will be performed approximately perpendicular to the general shoreline orientation at 50-foot intervals. These shore perpendicular survey lines will extend from the shoreline to the offshore limit. Tie lines will be performed in a direction to intersect the shore perpendicular lines. Tie lines will be performed at approximately 100-foot spacing from the shoreline to the offshore limit of the survey area.

For perimeter dike stability evaluation, offshore boring information will be collected. Soil conditions change rapidly in near-shore marine environments, therefore, actual soil data will be retrieved. Five offshore borings will be drilled using a drill rig on a barge with a tug.

Groundwater will be allowed 1 day to recover from drilling before depths to groundwater are measured. In the upland wells, piezometers will be installed in the borings to allow more accurate measurements of groundwater elevations. The piezometers will not be used for groundwater sampling, therefore, these will be one-inch diameter plastic/polyvinyl chloride (PVC) pipe installed inside the hollow-stem auger.

The results of the geotechnical exploration and testing will be included in the OU-3 RI Report Addendum, Volume III.

1.2.3 Seismic Evaluation

The seismic evaluation will be done in multiple phases. The first phase will consist of a site-specific seismic hazard analysis to estimate site "design earthquake" ground motions and an engineering assessment of seismic hazards (slope instability and liquefaction) using traditional limit equilibrium slope stability analysis methods (for example, PCSTABL 5M or UTEXAS3 computer programs) and empirical procedures for liquefaction evaluation (Seed and Idriss, 1971; Robertson and Wride, 1997). Phase I shall start with field testing to determine static and dynamic soil parameters. Soil types and strength shall be measured by drilling boreholes and sampling, cone penetrometer testing (CPT), and laboratory tests. If existing data such as CPT tests provide the data necessary, then additional testing will be minimized to a few confirmatory tests. Velocities of sound waves shall be measured using seismic refraction surveys (for example, non-intrusive spectral analysis of surface wave (SASW) method, CPT seismic cone, or down-hole and cross-hole methods).

The assessment will address both liquefaction potential and slope stability due to seismic forces along the entire length of waterfront dike system. The most critical slopes for analysis will be determined based on the slope geometry, and subsurface soil and groundwater conditions. In general, steeper slopes have more potential for deformation during an earthquake. Existing information on past slope movements (such as creep) and historic ground and slope deformations due to liquefaction at the site will be used to evaluate areas of highest potential for liquefaction. The results of Phase 1 will be identification and listing of areas where there is low or high potential for ground movement during earthquakes. No further seismic evaluations will be recommended in areas of low potential for ground movement. In areas of high potential for movement (that is, areas with marginal factors of safety against slope failure), a Phase 2 evaluation shall be required.

Phase 2 evaluations, if needed, will use Newmark-type deformation analysis methods (that is, Makdisi and Seed, 1978) to estimate seismically-induced slope deformations. Slopes with estimated large deformations may be identified for further deformation analyses by more rigorous methods.

The site "design earthquake" is selected based on design criteria from the Navy and historic earthquake ground motion measurements in the site area. Phase 2 calculations shall include quantifying potential liquefaction-induced ground surface subsidence and lateral spreading. Alternatives for mitigation of the identified seismic hazard impacts will be developed for implementation along with other site closure alternatives. An analysis of each of the identified alternatives will be performed in sufficient detail to support the FS and select a preferred alternative.

1.2.4 Issues

The 7-Step Data Quality Objectives (DQO) process was used to examine the scientific data collection elements of the project. Both phases of the project, the surface OEW investigation and the geotechnical/seismic evaluation were analyzed with the DQO process and the summaries of the objectives can be found in Tables 1-1 and 1-2.

The issues identified for the OEW investigation phase are provided as follows:

- How the cartesian coordinate grid will be established
- How the nesting seasons of listed and endangered species may affect project mobilization and duration
- How the surface investigation will be conducted

- No OEW is expected to be encountered, but if it is, the following issues must be considered:
  - The OEW will be considered investigative-derived waste
  - What actions will be taken if the OEW is considered unsafe to move
  - What actions will be taken if the OEW is considered safe to move

The issues identified for the geophysical and seismic evaluation phase are provided as follows:

- How potential seismic-induced slope deformations and soil liquefaction will affect performance of the site perimeter dikes
- Determine type, quantity, and locations of field investigation tests
- Determine representative soil samples for laboratory testing and select type and quantity of the tests
- Provide estimates of site design earthquake ground motions
- Evaluate site liquefaction potential
- Analyze static and seismic stability (seismic deformations) of the perimeter dike slopes
- Assess impacts of the site liquefaction and large slope deformations on performance of the dikes and recommend mitigation alternatives

1.2.5 Document Preparation

The documents to be prepared will include the following:

- Base-Wide Health and Safety Plan (BWHSP)
- Site-Specific Health and Safety Plan (SHSP)
- Focused RI Work Plan for OEW Investigation, and Geotechnical and Seismic Evaluations which includes Project CQC Plan and SOPs
- Report of Findings
- FS Report Attachment (information yielded from the investigative effort)

The Focused RI Work Plan, OU-3 RI Report Addendum, Volume III, and the FS Report Attachment will require internal draft (Pre-Draft), Draft, Draft Final, and Final Versions. The SHSP will require draft and final versions.

TABLE 1-1

DATA QUALITY OBJECTIVES FOR GEOTECHNICAL CONCERNS

STEP 1 Statement of Problem	STEP 2 Decisions	STEP 3 Input to the Decisions	STEP 4 Boundaries of the Study	STEP 5 Decision Rules	STEP 6 Limits on Decision Errors	STEP 7 Optimizing the Design
Site 1 is a 40-acre, unlined landfill. No maintenance has been performed. Waste depth is unknown. Lead, cadmium, and zinc levels above the California TTLC were detected. OEW was removed from the site in an earlier removal action. Site will receive a 4-foot topsoil cap and the end use will be a golf course. Seismic and geo-technical evaluation needed to determine the potential for slope failure into the San Francisco Bay.	What number of soil samples and tests are needed to characterize geotechnical parameters for the entire site? What are the existing data gaps that are needed to allow evaluation of seismic hazard exposure?	Historical Document Review will provide input for planning field testing program (number of CPTs, boreholes, locations, depths, sample types, sampling interval, sampling procedures, and etc.) Field results (SPT blow counts, vane shear and CPT test results) and laboratory tests will aid in evaluating the soil liquefaction potential and stability of perimeter dikes. Loading conditions will determine if UU, CD, or CU laboratory tests with pore water measurements will be performed. Data will include soil-strength characteristics and various loading conditions.	Paved runways northeast of the site (see Figure 4-2). Approximate area of investigation is described in Section 2.0 of the Work Plan. Tentative schedule for the fieldwork begins October 2001. Project closeout is tentatively scheduled for 2003.	If the Historic Document Review indicates that no data gaps exist, then FWENC will use available data. If not, then we shall proceed according to our Work Plan and the results of our Historical Document Review. If critical slopes require additional stability and deformation analyses, then we will use our Phase 2 evaluation—using Newmark-type deformation analysis methods.	Due to judgmental sampling design, decision errors will not be established. The sampling plan criteria are based on a preliminary historical document review and past knowledge of the Bay Area geology and seismicity. Judgmental seismic interpretation can also occur in the field using the CPT and other seismic equipment and in analyzing field data (slope stability analyses).	Upland samples will be collected to a minimum of a 20-foot depth. Samples will be collected every 5 to 10 feet or at any change of formation based on the historical CPT results and field geologist/ engineer observations. Similarly, the sample quantity for testing and laboratory testing program will be refined based on the past field test results. Locations of the analysis sections, initially selected based on the site topography (slope geometry), will be refined using the field and laboratory test data. Transect locations at 300-foot intervals were determined from past landfill field activity experience. Select interval locations will provide a continuous representation of the soil profile and in-situ properties.

Notes: CPT – cone penetrometer test
FWENC – Foster Wheeler Environmental Corporation
OEW – Ordnance and explosives waste
TTLC – total threshold limit concentration

TABLE 1-2

DATA QUALITY OBJECTIVES FOR ORDNANCE AND EXPLOSIVES CONCERNS

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
Statement of Problem	**Decisions**	**Input to the Decisions**	**Boundaries of the Study**	**Decision Rules**	**Limits on Decision Errors**	**Optimizing the Design**
OEW was found on Site 1 during a previous survey and removed. Site must be investigated to determine if OEW contamination exists. Site must be clear prior to land transfer. Site 1 was once a landfill where metal debris was buried. No OEW is expected to be encountered.	Is surface OEW contamination likely? What procedures will be used for OEW that is not safe to move? What procedures will be used for OEW that can be shipped?	UXO Site Investigation by SSPORTS (1999). OU-3 Remedial Investigation Report, Final (1999). Initial Assessment Study of Naval Air Station, Alameda, California, Final Report (1983). Results of the planned Surface Sweep. OEW safety, packaging and shipping publications. Search Effectiveness Probability (SEP) Test parameters.	Site IR-1, OU-3 of the former NAS Alameda. Surface sweep only. Area of surface sweep is described in Figure 2-1 in the Work Plan. Nesting season of listed species may affect mobilization date. Federal and state regulations affect the packing, transportation and treatment of OEW. CQC Plan (SEP procedures) affect and measure sweep procedures.	If no OEW is encountered during the surface investigation, no further action concerning OEW will be taken. OEW encountered will be evaluated as follows: - If unsafe to ship, a military EOD unit will respond. - If safe to ship, OEW packed and shipped IAW existing regulations and procedures.	If OEW is encountered it will be considered investigation derived waste and treated according to its status (safe, unsafe). SEP tests will ensure 90% confidence level for sweep effectiveness SEP tests will measure detection probability. If SEP below 85%, corrective measures in CQC plan taken.	Surveyors will establish a Cartesian Coordinate Search Grid. UXO Technicians will complete surface sweep. Process for packing, certifying and shipping OEW optimized.

Notes:
CQC – Contractor Quality Control
EOD – explosive ordnance disposal
NAS – Naval Air Station
OEW – ordnance and explosives waste
OU – Operable Unit
SEP – Search Effectiveness Probability
SSPORTS – Supervisor of Shipbuilding, Conservation and Repair, Portsmouth
UXO – unexploded ordnance

2.0 SITE DESCRIPTION

IR Site 1 is located in Alameda Point, Alameda, California (see Figure 2-1). The site is part of OU-3 of former NAS Alameda. Alameda Point is located on the westernmost end of Alameda Island, which lies on the east side of San Francisco Bay, adjacent to the City of Oakland (see Figure 1-1). Alameda Point is rectangular in shape, approximately 2 miles long east to west, 1 mile wide north to south. Alameda Point was occupied by the 1,734-acre former NAS Alameda until its closure in 1997.

2.1 DESCRIPTION AND CONSTRUCTION HISTORY

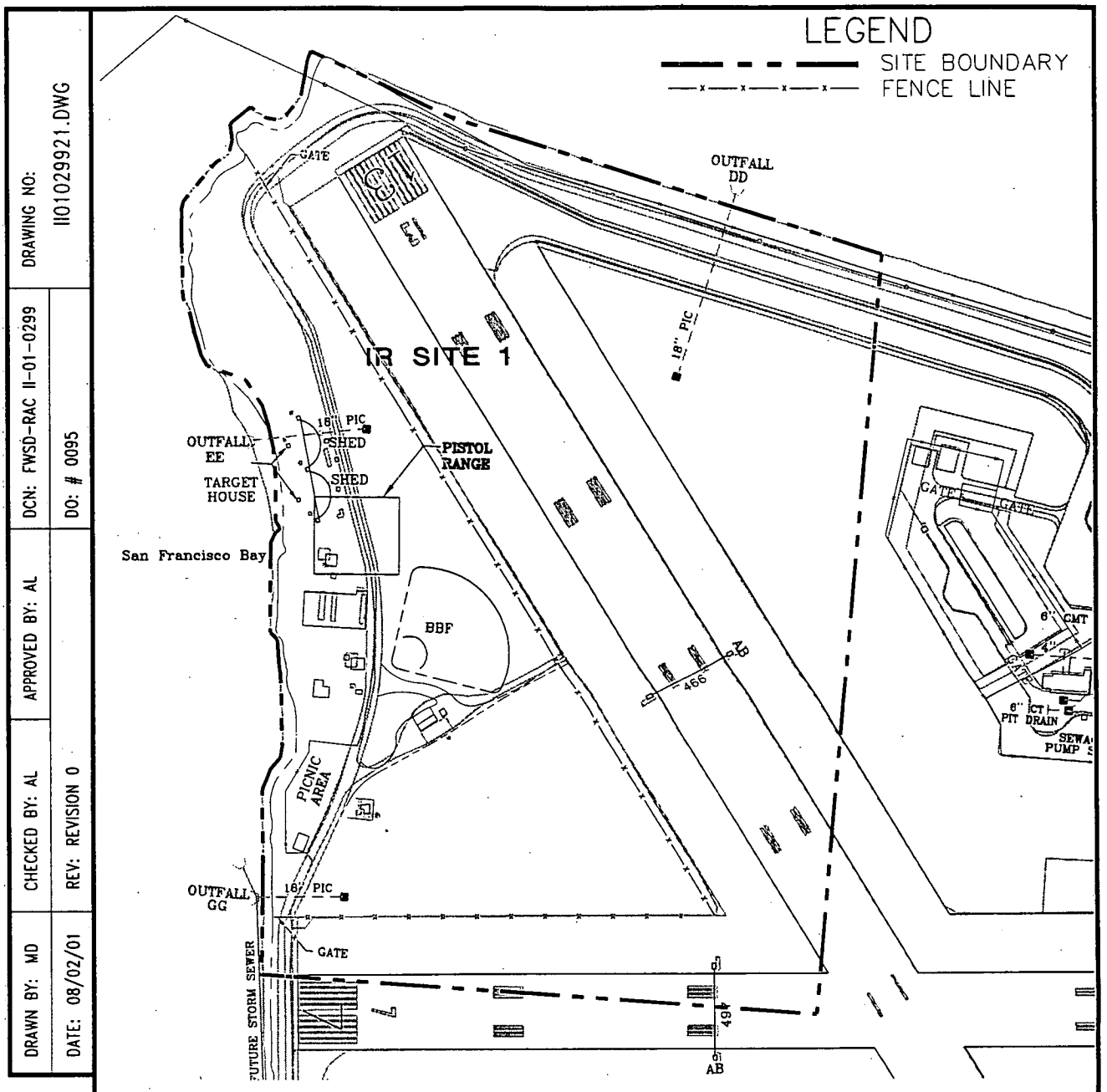
From 1943 to 1956, IR Site 1 was mainly used for waste disposal at former NAS Alameda. Prior to 1940, early maps show that the landfill area at IR Site 1 was under water (San Francisco Bay) at a depth of approximately 20 feet along the current western shoreline of the site. This area was reclaimed by dredging operations which involved placement of sunken barges and pontoons on the western edge of the landfill, and clay and silt sediments in the landfill area. A jetty was later transformed into a seawall protecting the harbor entrance which is now the northern edge of the landfill. Dredge spoils were among the original deposits in the landfill and aerial photographs taken in the 1940's show disposal operations taking place. New taxiways and runways were extended over the landfill in the 1950's. There are no records of placement of any liners at the landfill.

2.2 WASTE DISPOSAL HISTORY

Information regarding the history of landfill contents is limited. The primary method used by NAS Public Works to dispose of wastes in the seven landfill cells was to bulldoze trenches to the water table, fill them with waste, and then compact the surface. In the early years of operation, the waste was simply pushed into the water. Final cover material was applied to the landfill in later years. Accurate estimates of the types and amounts of wastes deposited at the IR Site 1 over the years are not available, but are believed to be approximately 15,000 to 200,000 tons of assorted refuse and debris, including scrap metal, waste oil, aircraft engines, low-level radiological wastes, solvents, paint wastes, cleaning compounds, creosote, waste medicines, reagents, asbestos, pesticides, mercury, and construction debris. Other Naval installations including Oak Knoll Naval Hospital, Naval Supply Center Oakland, and Treasure Island also used the site for waste disposal [Tetra Tech EM, Inc. (TtEMI) 1999; E&E, 1983].

2.3 PISTOL RANGE

The pistol range area is adjacent to the coastline in the middle of IR Site 1. The range was formerly used for pistol, rifle, and shotgun practice and an area to the north of the pistol range is believed to have been used as a disposal site for practice ordnance [20-millimeter (mm), lead bullets and pellets]. An earthen berm 10 to 15 feet high and lined with sandbags is located



400 200 0 400

SCALE IN FEET

Figure 2-1
IR SITE 1 LOCATION PLAN
ALAMEDA, CA

Southwest Division
Naval Facilities Engineering Command

FOSTER FW WHEELER
ENVIRONMENTAL CORPORATION

DRAWN BY: MD	CHECKED BY: AL	APPROVED BY: AL	DCN: FWSD-RAC II-01-0299	DRAWING NO: II01029921.DWG
DATE: 08/02/01	REV: REVISION 0		DO: # 0095	

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PLOT/UPDATE: AUG 10 2001 07:53:33

behind the firing lines. The pistol range area is approximately 220 feet by 200 feet in size and was in operation between the early 1940's and 1993. Types of weapons used at the pistol range included .22 caliber, .38 caliber, .45 caliber, .357 caliber, .44 caliber, 9 mm, and 12-gauge shotguns, according to archival information. Interviews of previous workers on the Base revealed that during the construction of the pistol range, the area was excavated to a depth of 8 feet to remove buried construction and mechanical debris (that is, fence material and aircraft engine parts). (TtEMI, 1999) Anecdotal evidence indicates that 20-mm projectiles fired into water tanks as a part of aircraft rework operations were collected and brought to IR Site 1 for burial. An unknown number of 55-gallon drums filled with fired 20-mm projectiles were reportedly entombed 4 to 8 feet in the excavation and spent projectiles were also mixed into concrete used for the pistol range foundations.

2.4 TOPOGRAPHY

Paved runways, roads, and nonnative grasslands comprise IR Site 1 and the area is mostly flat with slight depressions that sometimes flood during the winter rains. Uninhabited buildings, building foundations, and a former pistol range make up the disturbed areas of the site. Yellow sweet clover, ryegrass, and common plantain are the dominant plant species while feral rabbits are the dominant animal species in the non-disturbed areas of the site.

2.5 PREVIOUS INVESTIGATIONS

The Navy is conducting a RI with oversight from the U.S. Environmental Protection Agency (EPA), the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (RWQCB) in accordance with the CERCLA. Extensive radiological surveys were conducted at Alameda Point during this investigation.

2.5.1 Emergency Removal Action

During a 1998 radiological survey of IR Site 1 (which found low-level radiation), a number of live 20- mm high-explosive projectiles were discovered. UXO specialists from SSPORTS Environmental Detachment Vallejo conducted an Emergency Removal Action on IR Site 1 to allow safe completion of the survey. A total of 335 live 20-mm high-explosive projectiles, a .45 caliber round, and a .30 caliber round were recovered during the Emergency Removal Action as well as 12,159 inert 20-mm projectiles, 1,686 inert .50 caliber armor piercing projectiles, and 359 assorted brass cartridge cases (SSPORTS, 1998).

2.5.2 Soil Investigation

Soil samples taken in 1995 as part of a RI for both IR sites revealed total lead, cadmium, and zinc concentrations above the California total threshold limit concentrations (TTLC) of 1,000 milligrams per kilograms (mg/kg), 100 mg/kg, and 5,000 mg/kg, respectively, in the area of the former small arms range on IR Site 1 (Weston, 2000).

2.5.3 Surface Search

A surface search of approximately 8 acres of IR Site 1 was conducted in 1999 by SSPORTS Environmental Detachment of Vallejo, California, to visually locate, identify, and remove all exposed ordnance materials.

2.5.4 Geophysical Survey

Subsequent to the surface search of IR Site 1, a geophysical survey was completed by the SSPORTS Environmental Detachment using grid parameters previously established for the surface search. The search lanes were spaced 2 feet apart and were traversed in a north-south direction. A Geometrics G-858 portable cesium sensor magnetometer (in a gradiometer configuration) in conjunction with a Trimble ProXR, real-time digital global positioning system (DGPS) was used to simultaneously acquire DGPS positions and subsurface magnetic data. Anomalies identified in the survey results were consistent with expected findings of geophysical surveys conducted in landfills with known subterranean metal debris.

2.6 SUMMARY OF OEW RISK

An emergency removal action was conducted in 1998 to clear all surface OEW from an 8 acre site on and around the pistol range. 335 live 20-mm high explosive projectiles, 2 live small arms cartridges and 14,304 inert ordnance items were removed. No further OEW has been found on Site 1 since then. The MPM that could be encountered is a 20-mm high-explosive projectile that contains a small quantity of high explosive in a steel body. Physical forces (that is, centrifugal force and setback) causes the nose fuze used in the projectile to arm during the firing process, and then detonate upon striking a solid surface. Fired rounds, identified by grooves on the rotating bands, are considered armed because their nose fuzes have experienced the firing process. Rough handling, static electricity, or impact could detonate the round(s) and cause severe injury to personnel in their vicinity.

3.0 PROJECT MANAGEMENT

The project management team will be responsible for all technical and administrative aspects of the surface OEW investigation, and geotechnical and seismic evaluations. Included among the team's responsibilities are the project schedule, staffing, data management, document control, project meetings, and reporting.

3.1 PROJECT ORGANIZATION

The project organization consists of FWENC and Navy personnel who will conduct technical and administrative functions to ensure effective execution of the different tasks. A description of these key personnel and their responsibilities are provided below. A Project Organization Chart is presented in Figure 3-1.

3.1.1 Project Personnel

The Navy Remedial Project Manager (RPM) for this project is Mr. Rick Weissenborn who is responsible for managing the project, monitoring the budget, maintaining the schedule, and interacting with regulatory agencies and community members. Mr. Doug DeLong is the Environmental Compliance Manager (ECM) and caretaker for former NAS Alameda, and will be responsible for coordinating field activities, and ensuring that operations conducted on the site are in compliance with Base-specific rules and regulations. Ms. Shirley Ng is the Resident Officer in Charge of Construction (ROICC) and is responsible for quality control and technical oversight of the field activities.

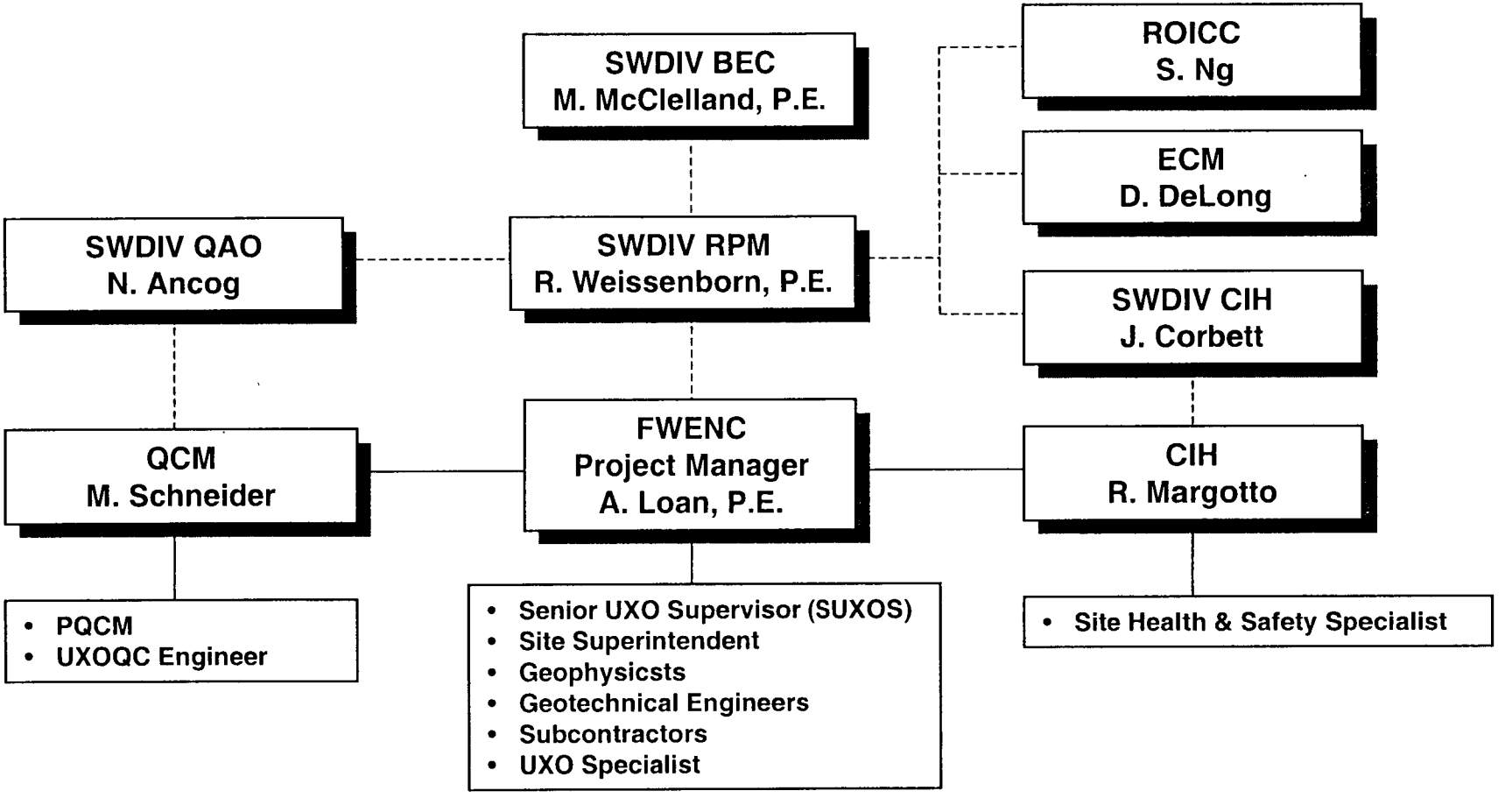
The key FWENC personnel involved in the performance of this DO include the Project Manager (PjM), Site Superintendent, Senior Unexploded Ordnance (UXO) Supervisor (SUXOS), Certified Industrial Hygienist (CIH), Site Health and Safety Specialist/Quality Control Manager (SHSS/QCM), geotechnical engineer and UXO Specialists. In addition to these individuals, the project will be supported by a multi-disciplinary team of specialists who will lead or coordinate the various project subtasks, as required, under the direction of the PjM.

3.1.1.1 Project Manager

The PjM will be the main point of contact with the Navy for all project-related matters and he will be responsible for the overall conduct and performance of the project. The FWENC PjM will interface directly with the Navy RPM. The PjM is primarily responsible for the development and implementation of the Focused RI Work Plan, which includes coordination among the task leads and support staff, acquisition of engineering or specialized technical support, and all other aspects of the day-to-day activities associated with the project. The PjM identifies staff requirements, directs and monitors project progress, ensures implementation of quality procedures and compliance with applicable codes and regulations, and is responsible for performance within the established budget and schedule.

Figure 3-1

Project Organization Chart



3.1.1.2 Site Superintendent

The Site Superintendent is responsible for effective execution of the field activities in accordance with the proposed plan and the regulatory requirements. The Site Superintendent, with the support of FWENC's SHSS, are responsible for health and safety of the field personnel. Other responsibilities include, but are not limited to: (1) project planning, (2) scheduling, (3) site documentation, (4) regulatory compliance, (5) personnel assignments, (6) customer and subcontractor relations, (7) enforcing health and safety rules and SHSP requirements, and (8) conducting routine safety inspections and incident investigations. The Site Superintendent reports directly to the PjM.

3.1.1.3 Senior UXO Supervisor

The Senior UXO Supervisor will be directly responsible for all aspects of explosive safety for the project. The SUXOS will act as the Site Superintendent. The SUXOS assists in the development of site-specific work plans, identifies personnel and equipment requirements, and directly supervises all daily activities of the field team. The SUXOS is responsible for the successful performance of the field team, the early detection and identification of potential problem areas and instituting corrective measures. The SUXOS is also responsible for execution of instructions received from the FWENC PjM and the Navy's RPM, documentation of site conditions, photographing UXO recovery and disposal operations, preparation of all project reports, and identifying any effort required to accomplish the Scope of Work. .

3.1.1.4 Site Health and Safety Specialist

The Site Health and Safety Specialists (SHSS) is UXO-qualified and is responsible for the implementation of the BWHSP, SHSP, on-site training requirements, and recommending changes to level of personal protective equipment (PPE) to the CIH as site conditions warrant. The SHSS has Stop Work authority for safety conditions. The SHSS evaluates and analyzes any potential safety problems, implements safety-related corrective actions, and maintains a daily safety log.

3.1.1.5 UXO QC Representative

The UXO QC Representative will be responsible for QC activity related to all OEW and OEW-related work. The SHSS will perform the duties of the UXO QC Representative for this project. The duties of UXO QC Representative include:

- Implement UXOS Surface Clearance Team certification procedures prescribed in the CQC Plan as directed by the Project Quality Control Manager (PQCM).
- Conduct Surface Clearance Effective Tests defined in the CQC Plan as directed by the PQCM.
- Conduct surveillance activity of encountered OEW (if any).

- Conduct other inspection/audit activity as directed by the PQCM.
- Complete reports and other documentation as directed by the PQCM.

3.1.1.6 Geotechnical Engineer

The geotechnical engineer is responsible for the implementation of the geotechnical and seismic evaluations.

3.1.1.7 UXO Specialist

The UXO Specialist performs on-site duties including locating UXO, equipment operation, UXO safety, excavation, and escort duties as required. The UXO Specialist reports to the SUXOS.

3.1.1.8 Equipment Operator

The equipment operator is trained in the use of specific equipment, clearing, and grubbing techniques. This individual reports to the assigned SUXOS.

Note: The PjM, and equipment operator are not required to be UXO-trained. Each will have received training on UXO safety precautions and basic ordnance recognition features, but are **NOT** permitted to excavate or handle suspected or known OEW.

Table 3-1 is a list of contact names and telephone numbers for Navy, FWENC, and other key personnel involved in this project:

3.2 PROJECT SCHEDULE

The project schedule is shown in Figure 3-2.

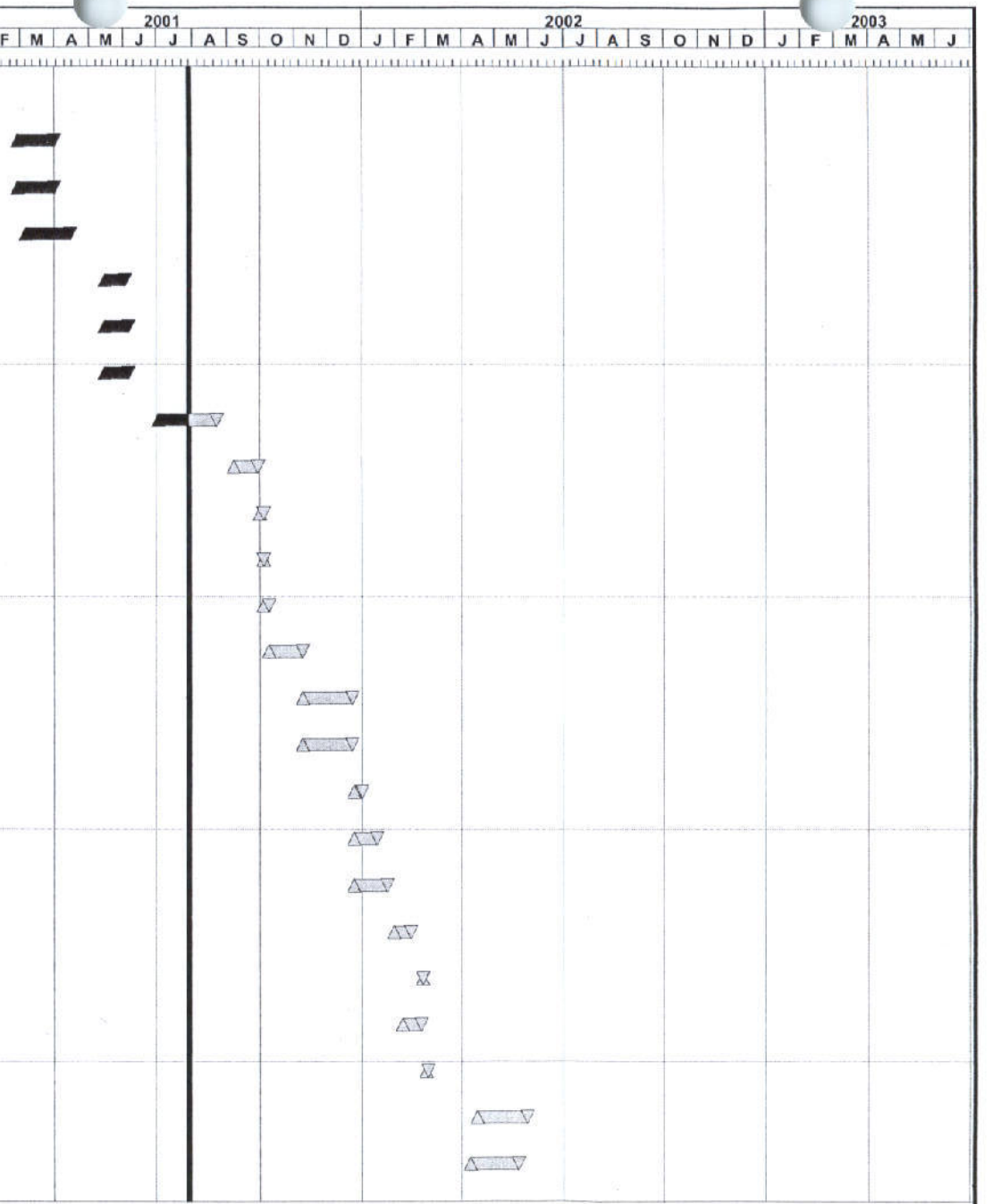
3.3 PROJECT COMMUNICATIONS AND REPORTING

The FWENC PjM will work in close communication with the Navy RPM to keep him informed of any technical or administrative issues that may impact the project schedule or budget and to ensure that all of the Navy's project requirements are met. Any communication that has the potential to impact the project scope of work, schedule, or budget will be confirmed via written correspondence between the PjM and the RPM.

3.3.1 Progress Reports

FWENC will provide monthly progress reports to the Navy for the DO. These reports will document activities completed during the previous month, activities in progress, and activities scheduled for the upcoming month. Work breakdown structure, cost account, and manpower spread reports will also be included in the monthly progress report. These reports will reveal any actual or potential variances in the project schedule or budget. The monthly progress report will also discuss what actions, if any, will be needed to correct such variations.

Activity Description	Early Start	Early Finish
Site Assessment/Pilot Tests		
Foster Wheeler Environmental Corp.		
Draft Base-Wide Health & Safety Plan (HSP)	26FEB01A	30MAR01A
Draft Site HSP Sites 1&2	26FEB01A	30MAR01A
Pre-Draft Work Plan Site 1	05MAR01A	13APR01A
Draft Work Plan Site 1	15MAY01A	01JUN01A
Final Site HSP Sites 1&2	15MAY01A	05JUN01A
Final Base-Wide HSP	15MAY01A	05JUN01A
Draft-Final Work Plan Site 1	02JUL01A	22AUG01
Final Work Plan Site 1	07SEP01	28SEP01
Field Mobilization Site 1	01OCT01	02OCT01
Site Surveys Site 1	03OCT01	03OCT01
Clear and Grub Site 1	04OCT01	08OCT01
UXO Surface Sweep Site 1 (Visual)	09OCT01	07NOV01
Upland Exploration Site 1	08NOV01	21DEC01
Offshore Exploration Site 1	08NOV01	21DEC01
Field Demobilization Site 1	24DEC01	31DEC01
Pre-Draft FS Attachment Site 1	24DEC01	14JAN02
Pre-Draft Report of Findings Site 1	24DEC01	23JAN02
Draft FS Attachment Site 1	30JAN02	13FEB02
Community Relations Presentation - UXO	25FEB02	25FEB02
Draft Report of Findings Site 1	07FEB02	22FEB02
Community Relations Presentation - Geotech	01MAR02	01MAR02
Draft-Final FS Attachment Site 1	16APR02	29MAY02
Draft-Final Report of Findings Site 1	10APR02	22MAY02



Start Date 09FEB01
Finish Date 29APR03
Data Date 30JUL01
Run Date 09AUG01 14:58

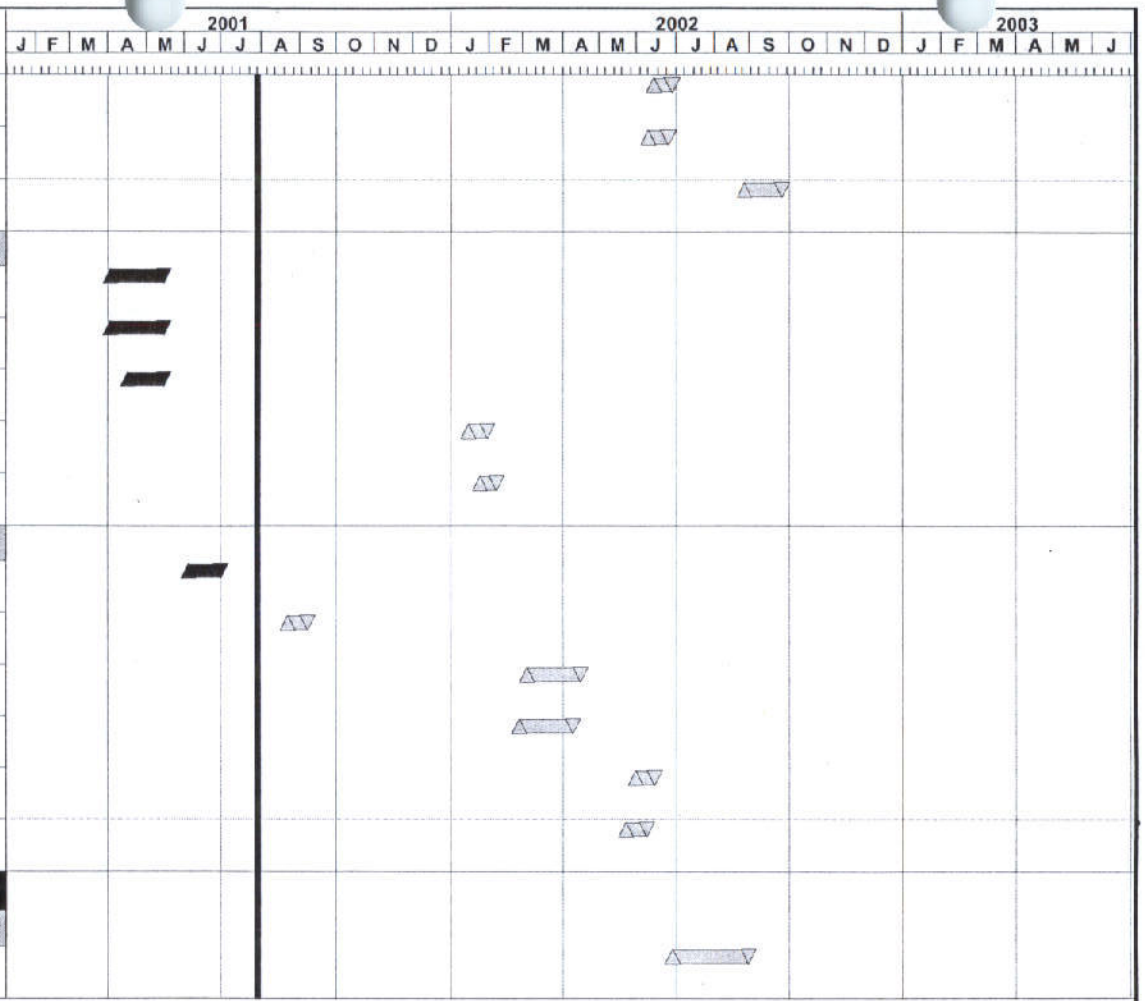
Early Bar
Progress Bar
Critical Activity

Foster Wheeler Environmental Corp.
EFA Northwest RAC
DO # 0095
Landfill Site 1 UXO Removal, Alameda

Figure 3-2

Sheet 1 of 2

Activity Description	Early Start	Early Finish
Final FS Attachment Site 1	14JUN02	27JUN02
Final Report of Findings Site 1	10JUN02	24JUN02
GIS Input	28AUG02	25SEP02
NAVFAC Southwest Division		
Draft Base-Wide HSP Navy Review	02APR01A	14MAY01A
Draft SHSP Sites 1&2 Navy Review	02APR01A	14MAY01A
Pre-Draft Work Plan Site 1 Navy Review	16APR01A	14MAY01A
Pre-Draft FS Attachment Site 1 Review	15JAN02	29JAN02
Pre-Draft Report of Findings Site 1 Review	24JAN02	06FEB02
Government & Regulators		
Draft Work Plan Site 1 Agency Review	04JUN01A	29JUN01A
Draft-Final Work Plan Site 1 Agency Review	23AUG01	06SEP01
Draft FS Attachment Site 1 Agency Review	04MAR02	15APR02
Draft Report of Findings Site 1 Agency Review	26FEB02	09APR02
Draft-Final FS Attachment Site 1 Review	30MAY02	13JUN02
Draft-Final Report of Findings Site 1 Review	23MAY02	07JUN02
Job Closeout		
Foster Wheeler Environmental Corp.		
Site Assessment Closeout Site 1	28JUN02	30AUG02



Start Date 09FEB01
Finish Date 29APR03
Data Date 30JUL01
Run Date 09AUG01 14:59

Early Bar
Progress Bar
Critical Activity

Foster Wheeler Environmental Corp.
EFA Northwest RAC
DO # 0095
Landfill Site 1 UXO Removal, Alameda

Figure 3-2

Sheet 2 of 2

TABLE 3-1

LIST OF CONTACTS INVOLVED IN THE PROJECT

Agency	Contact	Project Title
Naval Facilities Engineering Command Southwest Division BRAC Operations 1230 Columbia St., Suite 1100 San Diego, CA 92101	Mr. Rick Weissenborn (619) 532-0952	RPM
Naval Facilities Engineering Command Southwest Division BRAC Operations 1230 Columbia St., Suite 1100 San Diego, CA 92101	Mr. Mike McClellan (619) 532-0965	BRAC Environmental Coordinator
Naval Facilities Engineering Command Southwest Division Caretaker Site Office – San Francisco Bay Area 410 Palm Ave., Building 1, Suite 161 San Francisco, CA 94130-1802	Mr. Doug DeLong (415) 743-4718	ECM
Naval Facilities Engineering Command Southwest Division 1230 Columbia St., Suite 1100 San Diego, CA 92101	Mr. Rick Lovering (619) 532-0763	Contracting Officer
Naval Facilities Engineering Command Southwest Division 1220 Pacific Highway San Diego, CA 92132-5187	Mr. Narcisco Ancog (619) 532-2540	Quality Assurance Officer
Naval Facilities Engineering Command Southwest Division 1220 Pacific Highway San Diego, CA 92132-5187	Ms. Joyce Howell-Payne (619) 532-0978	Contract Specialist
Naval Facilities Engineering Command Southwest Division 2450 Saratoga Street, Building 110, Suite 200 Alameda Point, Alameda, CA 94501	Mr. Izzat Ahmadiyya (510) 749-5947	ROICC
U.S. Environmental Protection Agency 75 Hawthorne St. (SFD-8-2) San Francisco, CA 94105-3901	Ms. Anna-Marie Cook (415) 744-2367	EPA-RPM
California Environmental Protection Agency Department of Toxic Substances Control 700 Heinz Avenue, Suite 200 Berkeley, CA 94710	Mr. Daniel Murphy (510) 540-3772	DTSC-RPM

TABLE 3-1 (Continued)

LIST OF CONTACTS INVOLVED IN THE PROJECT

Agency	Contact	Project Title
California Regional Water Quality Control Board 1515 Clay Street, Suite 400 Oakland, CA 94612,	Mr. Dennis Mishek (510) 622-2390	RWQCB-RPM
FWENC NAVWPNSTA Seal Beach PMO Site Trailer Industrial & Gardeners Road 800 Seal Beach Boulevard Seal Beach, CA 90740	Mr. Jamshid Sadeghipour (562) 598-6150 Ext. 5880	Deputy Program Manager (DPM)
FWENC 1940 East Deere Avenue, Suite 200 Santa Ana, CA 92705	Mr. Abid Loan (949) 756-7514	PjM
FWENC NAVWPNSTA Seal Beach PMO Site Trailer Industrial & Gardeners Road 800 Seal Beach Boulevard Seal Beach, CA 90740	Ms. Mary Schneider (562) 936-5881	Program Quality Control (QC) Manager
FWENC 1230 Columbia St., Suite 640 San Diego, CA 92101	Mr. Walt Hess (619) 234-8696	Project Superintendent/ Senior UXO Supervisor
FWENC 1230 Columbia St., Suite 640 San Diego, CA 92101	Mr. Tony Crino (619) 234-8696	UXOQC Engineer/Site Health and Safety Specialist (SHSS)
FWENC 1230 Columbia St., Suite 640 San Diego, CA 92101	Mr. Lance Humphrey (619) 234-8696 Ext. 237	Associate PjM
Alameda Fire Department (Dispatch) 1555 Oak Street Alameda, CA 94501	Dispatch (510) 522-2423	
Alameda Police Department (Dispatch) 1555 Oak Street Alameda, CA 94501	Dispatch (510) 522-2423	

3.4 PROJECT DELIVERABLES

The major project deliverables for the IR Site 1 OEW-geotechnical characterization, seismic evaluations are provided as follows:

- Base-Wide Health and Safety Plan (Draft and Final)
- Site-Specific Health and Safety Plan (Draft and Final)
- Focused RI Work Plan (Internal Draft, Draft, Draft Final, and Final)
- Field Books, Sketches, Computation Sheets, and Tabulation Sheets (if required)
- RI Report Addendum, Volume III (Internal Draft, Draft, Draft Final, and Final)
- FS Report Attachment (Internal Draft, Draft, Draft Final, and Final)
- Monthly Reports
- Meeting Minutes [internal meetings only – not BRAC Closure Team (BCT) or other public meetings]

3.5 MANAGEMENT OF FIELD OPERATIONS

This section describes the management of field operations during the OEW investigation, and geotechnical and seismic evaluations at IR Site 1.

3.5.1 Site Access and Control

The IR Site 1 is not readily accessible to the public. Two gated-fences exist between public roadways and the site, and a third fence surrounds the remaining site boundary. The ECM maintains keys to the gates and all visitors must register with the ECM to gain access to the site. An escort is required for access to the site. Minimal changes to the current accessibility of the site during investigation and removal operations will be required.

Site access and control measures implemented by FWENC will involve the following:

- One office trailer and a storage container for equipment will be mobilized to the site and secured.
- Access to areas being used for investigation/surveys will be restricted through use of caution tape to ensure the activities are not disturbed.
- Temporary barricades and warning signs will be used to prevent access to any areas that pose an immediate risk to health and safety due to OEW found during the investigation; FWENC UXO personnel will erect the barricades and assist the ECM with road closures, if necessary. All barricades will be removed immediately after completion of OEW investigative operations.

- Exclusion zones that will restrict access to areas on the site will be established during certain operations and coordinated through the ECM. The size of the exclusion zones may vary depending on requirements and will be determined by the SUXOS. Security measures will be established to keep nonessential personnel out of the affected area(s).

3.5.2 Field Office/Command Post

FWENC personnel will maintain an office trailer/command post and a storage container just inside the southern gate of IR Site 1 for the duration of the field operations and will coordinate and install the necessary utilities (to include telephone and electricity). Bottled water for drinking and handwashing will be maintained at the Site Office trailer. The trailers will be locked at the end of each workday. The final location of the trailers will be approved by the ECM.

3.5.3 Traffic Control/Parking

Parking will be restricted to a site adjacent to the Site Office trailer and areas where investigation/evaluation operations are underway. Only existing parking areas will be utilized. As needed, vehicles may need to travel off existing roads to move equipment and/or personnel.

4.0 PROJECT EXECUTION

This section provides an overview of FWENC's approach to performance of OEW investigation and geotechnical and seismic evaluations at IR Site 1. A brief description of safety requirements and procedures followed during performance of the work are also provided.

4.1 PRE-MOBILIZATION

Pre-mobilization activity will involve notifications to appropriate agencies/personnel, kickoff meetings, mobilization of equipment, and set-up of temporary support facilities. A brief description of these activities is presented below.

4.1.1 Notification

The work will be performed on federal land within the confines of the former NAS Alameda. The EFA West ECM/Caretaker will be notified and a project schedule will be provided. Any changes in the schedule will be forwarded to the ECM. In addition, the ECM will be notified of mobilization dates and all schedule changes.

4.1.2 Pre-Mobilization Conference

Prior to commencing field activities, a pre-mobilization conference will be held by FWENC PjM with the Navy RPM, ROICC, and Alameda Point personnel. The meeting will be held to discuss and develop an understanding of the planned field activities including the fieldwork schedule, the health and safety program, field documentation, and project submittals. Subcontractors identified to perform part of the geotechnical work will also attend. Appropriate notifications required to commence work will be verified with the ROICC. Former NAS Alameda site-specific protocol, as applicable to the field execution, will be discussed and verified.

4.1.3 Mobilization of Equipment and Personnel

Upon final approval of the Focused RI Work Plan and receipt of authorization to proceed, the field personnel, equipment, and material will be mobilized for the field activities. The OEW investigation, and geotechnical and seismic evaluations will consist of the following personnel:

- Two surveyors for locating/marking and establishing the search grids
- SUXOS
- UXO/SHSS
- UXO Specialists (up to four)
- Geotechnical Engineers (up to three)

Prior to conducting any field activities, FWENC UXO personnel will conduct a visual surface sweep of all support zones, staging areas, and access roads as required to support site activities. A Schonstedt GA-52CX magnetometer will be used as an aid in locating and avoiding hazardous surface items. All initial site activities will require a UXO Specialist escort. Further non-intrusive activities in areas previously inspected by UXO Specialists will not require a UXO escort (FWENC, 1998).

The following field equipment is anticipated to be utilized on-site during investigation and other field operations. This list does not include hand-held screening devices and other smaller field equipment that will be on-site at various points throughout the field effort.

- Tractor-mounted grass cutter (Bush Hog)
- Hand-held grass cutters (Weed Eaters)
- Generator [60 kilowatt (kW) for the Site Office trailer]
- Truck-mounted drill rig
- Magnetometer
- Equipment storage container

4.1.4 Safety Procedures

The site-specific safety procedures found in the documents listed below will be followed throughout this project:

- BWHSP and SHSP
- SOP-1 for Ordnance and Explosives/unexploded Ordnance Disposal Disposition (Appendix B)
- SOP-2 for Drilling, Geotechnical Sampling, and Testing (Appendix B)
- SOP-3 for Cone Penetrometer Testing (Appendix B)

The surface OEW investigation will not take place in known chemical warfare monitoring (CWM) areas. If, however, the presence of CWM or chemical agents is suspected at any time, all work will stop and personnel will immediately evacuate a minimum of 100 feet in an upwind direction and notify the RPM, ECM, and the FWENC PjM. The Alameda Hazardous Material Response Team (510-522-2423) or military EOD unit will be notified, as appropriate. FWENC UXO personnel will secure the area until relieved by competent authorities (FWENC, 2001a).

4.1.5 Temporary Support Facilities

The temporary facilities will include a Site Office trailer, an equipment storage container, a portable generator for power, copier, office furniture, desktop computers, and two portable

toilets. Cellular telephones and hand-held radios will be used for on-site and off-site communications.

4.2 SURVEYING AND SITE CONTROL

Based on previously conducted site surveys, it is determined that IR Site 1 is accessible to project personnel and equipment, and no road grading or earth moving is required. The terrain in and around IR Site 1 is relatively flat. Existing vegetation will not impact access or egress and will be cut to a height of 4 inches (or less) to permit the surface OEW investigation. IR Site 1 is fenced on the north, south, and east sides. San Francisco Bay is located to the west of IR Site 1. There are two access gates that are located on the north and south sides (see Figure 2-1). The gates will remain locked during mowing and surface OEW-investigative activities. The Alameda Point Caretaker/ECM controls the access and maintains the keys to the gates. When fieldwork is taking place, the Site Superintendent will maintain a duplicate set of gate keys and will control the entrance and exit from the IR Site 1.

4.2.1 Exclusion Zone

Exclusion zones (EZ) are areas where contamination (hazards) are known or likely to be present, or areas that, because of activity, have the potential to cause harm to personnel. The minimum EZ for the surface OEW investigation will be 300 feet. If OEW is detected, the EZ will be expanded to 1,250 feet for non-fragmenting explosive materials, 2,500 feet for fragmenting explosive materials, or 4,000 feet for bombs and projectiles with 5-inch and greater caliber. The EZ shall be large enough to protect other personnel from the blast and fragmentation hazards of accidental detonation. Should a situation develop that requires an exclusion zone of 2,500 or 4,000 feet, the Alameda and Oakland Police Departments will be called on to assist in the evacuation of personnel. The 300-foot exclusion zone arc is depicted in Figure 4-1.

4.2.2 Exclusion Zone Marking and Control

All of Site 1 will be investigated. Until the surface OEW investigation of Site IR 1 is complete, access to the work site will be strictly controlled and limited to UXO-qualified, (or UXO supervised/escorted) authorized and essential personnel only. The exclusion zone will be maintained around Site 1 during mowing and surface OEW-investigative activities. Access gates will be secured, roads will be barricaded and posted, and a red "Bravo" flag will be flown near the access gates to provide a visual indication of potentially hazardous operations in progress (FWENC, 1998). If OEW is discovered that is unsafe to transport and requires blow-in-place (BIP) procedures, the SUXOS will expand the exclusion zone to a distance determined by the type/size of OEW encountered.

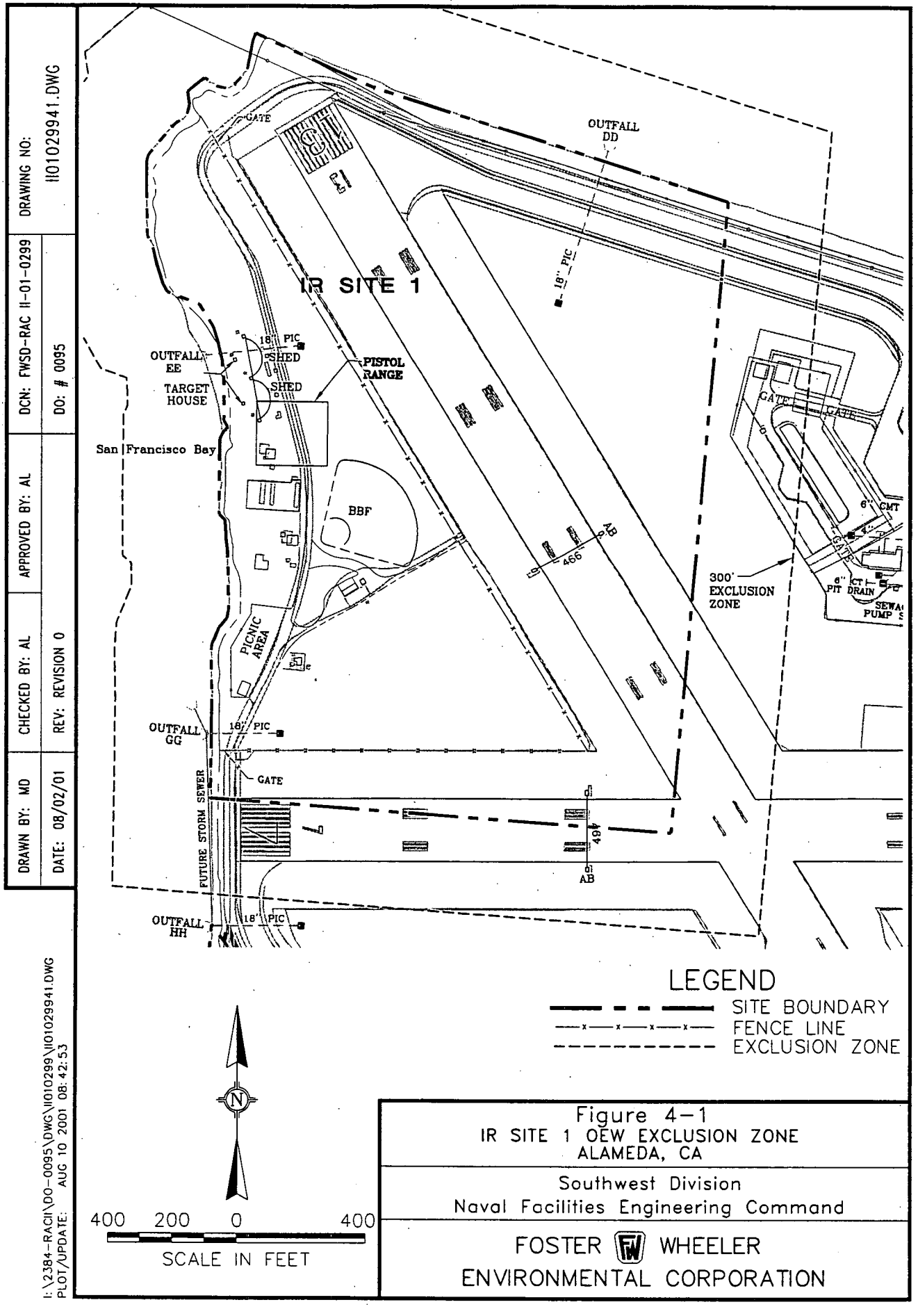


Figure 4-1
IR SITE 1 OEW EXCLUSION ZONE
ALAMEDA, CA

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4.2.3 Communications

Due to the unavailability of utilities and services, cell phones will be used for all routine communications and to coordinate emergency assistance and logistical support. A radio communication system will be established and used for daily, on-site communications between different on-site activities and personnel engaged in fieldwork. One person in every work team will carry a radio and cellular telephone. The SUXOS, also the acting Site Superintendent, will ensure a project communications network is established and tested each day prior to the start of operations.

4.2.4 Metal Avoidance Procedures

Large amounts of dense metal debris that could damage excavation and drilling equipment are believed to have been buried in the IR Site 1 landfill. Following the completion of the surface OEW investigation, FWENC UXO technicians will assist geotechnical personnel by performing Metal Avoidance Procedures for test pit and borehole excavations. Metal Avoidance Procedures can be found in SOP-2 and SOP-3 in Appendix B.

4.2.5 Bathymetric Survey

Surveying at the site will include a bathymetric survey and shoreline survey, with sufficient coverage to address potential sliding or lateral spreading of perimeter dikes. The horizontal location of the shoreline will be surveyed. The survey will provide coverage for the shoreline and offshore areas to a distance of approximately 500 feet offshore. All maps will be prepared using the following datums:

- Horizontal – Mercator Projection. GRS 80. State Plane Coordinate System, North American Datum 1983, Lambert Zones 1 through 6
- Vertical – Mean Sea Level, North American Vertical Datum, 1988

The proposed methodologies and scope of work to be used are outlined below for the open water bathymetric surveying.

Openwater Bathymetry

Openwater bathymetry will be performed at the site in areas accessible by the survey vessel as described below:

- The survey will be performed to U.S. Army Corps of Engineers (USACE) Class 1 hydrographic survey standards. A copy of this standard will be available on-site during the survey work.
- A survey boat, approximately 30 feet in length, equipped with a side-mounted, single-frequency fathometer and DGPS equipment will be used.

- The DGPS will provide submeter positioning accuracy and will consist of a base station and roving unit. A reference station (base station) will be established at the survey site. Differential corrections will be transmitted from the base station to the roving unit (located on the survey vessel). If the required accuracy can be achieved using U.S. Coast Guard DGPS correction broadcasts, a reference station may not be required.
- As a quality control check, the horizontal coordinates generated by the DGPS will be compared with a known survey point (monument or other recoverable marker) at start and end of each survey day.
- A survey-grade fathometer capable of USACE Class 1 accuracy standards will be used. The fathometer will be connected to a computer for digital data collection.
- A recording tide gauge and a visually observed tide staff will be set at the project site to monitor water surface elevations during survey operations. The data from the tide gauge and staff readings will be surveyed into the project datum and used to adjust the recorded survey data.
- Real-time positioning and integrated data collection will be performed using HYPACK hydrographic surveying software operating on a computer. This software provides a real-time display of vessel position for use in navigation of planned survey lines, while recording data from the DGPS and fathometer.
- Survey lines will be performed approximately perpendicular to the general shoreline orientation at 50-foot intervals. Bay-floor anomalies will be surveyed in detail. Data from the echo sounder, DGPS, compass, and tide gauge will be co-processed. At a survey speed of 3-4 knots, 4 soundings per foot are typically collected along the tracklines and the analytical process reduces the data to 1 sounding every 2 feet. This collection frequency is capable of detecting relatively small features on the bay floor. These shore-perpendicular survey lines will extend from the shoreline to the offshore limit. Tie lines will be performed in a direction to intersect the shore-perpendicular lines. Tie lines will be performed at approximately 100-foot spacings from the shoreline to the offshore limit of the survey area.
- Although aquatic plants are not expected in the survey area, their presence can degrade fathometer performance and accuracy. Class 1 accuracy standards may not be achievable within areas of aquatic plants.

Water surface elevation will be monitored during survey operations by a recording tide gauge and manually observed by the tide staff. Space will be required for installation of these items. The tide gauge will be installed from a dock or pier in the seaplane basin. The tide gauge is an internally recording instrument that records data at a preset interval. The tide gauge will be recovered, data downloaded, and the instrument reinstalled periodically during the performance of on-water survey activities. The gauge will be recovered and reinstalled at a time when surveying is not actively being performed to avoid data gaps. The tide staff will be strapped to an existing piling or dock and will be used to visually observe and record tidal activities periodically during survey operations. It is anticipated that the tide staff will be observed at the start and end of each day while survey operations are underway.

To provide navigation and positioning data, a DGPS system will be used. This system may require the use of a reference station established at the site. This reference station consists of setting up a DGPS base station (GPS receiver, antennae, radio transmitter, and power source) over a known control point within the site. Differential corrections are broadcast from the reference station to the roving unit (aboard the survey vessel) via radio modem. The reference station will be located in a secure area where it will not be disturbed during survey operations. Any disturbance of the reference station during survey operations will have a detrimental effect on data and may necessitate a re-survey. The reference station should be located in an open area, not adjacent to structures that may interfere with GPS or radio signals. It is anticipated that the shoreline surveying and openwater bathymetry will be performed concurrently by separate crews, with the upland survey work performed by a licensed subcontractor.

The bathymetry data will be used in conjunction with tide, wind, and wave data for design of dike and shoreline erosion protection.

4.3 OEW INVESTIGATION

An OEW investigation will be completed over the entire area of IR Site 1. The vegetation on IR Site 1 will be cut to a height of 4 inches (or less) prior to the beginning of the surface OEW investigation. FWENC UXO personnel will proceed ahead of the mowing equipment to prevent encountering OEW. Following the locating, marking, and mapping of the corner points of the site using existing GIS data, a local Cartesian Coordinate grid system will be established to enable the UXO specialists conducting the surface investigation to identify relative positions of OEW, if any are located. The coordinate axes will have an origin on the southwestern corner of the site and will be spaced 100 feet apart, creating a network of 100 x 100-foot grids. The Y-axis will run north-to-south, the X-axis east-to-west and the points where grid lines intersect will be marked with surveyors flags. UXO Specialists will prosecute the site in a line abreast, spaced sufficiently near one another to ensure complete visual coverage as the sweep line navigates systematically through the grid. If any OEW is encountered, its location will be referenced by an abscissa/ordinate intersection point using the appropriate alphanumeric label of the grid's placement within the coordinate system.

Any suspected or known OEW encountered will be clearly marked and its position annotated on the site map. The Senior UXO Supervisor shall evaluate all encountered UXO and determine if the work planned for the area can safely continue or what actions must occur prior to commencing work in that area. The exclusion zone will be expanded to the appropriate distance. If the ordnance item is considered hazardous, work in the area will cease and personnel will be evacuated to a safe distance. UXO personnel will rope off the area with tape or flags and only essential UXO personnel will be allowed into the zone until the hazard has been removed.

FWENC UXO personnel will determine the status of any OEW encountered during the investigation. OEW items identified as safe to move/transport will be stored in magazine M353

or 354 until the completion of investigative activities, a period of approximately 2 weeks. The OEW will then be packaged on-site, manifested, and shipped to a treatment facility. OEW items that are unsafe to move/transport will require BIP procedures and the Travis AFB EOD unit will be requested to respond. Prior to initiating BIP procedures, the following notifications will be made:

Agency	Name	Telephone Number
Naval Facilities Command (NAVFAC), Southwest Division	Rick Weissenborn	(619) 532-0952
NAS Caretaker Site Office	Doug Delong	(415) 743-4718
EPA	Anna-Marie Cook	(415) 744-2367
Cal-EPA DTSC	Daniel Murphy	(510) 540-3767
FWENC	Abid Loan	(949) 756-7514
Alameda Police Department	Dispatch	(510) 748-4508
Alameda Fire Department	Dispatch	(510) 522-2423

Standardized Operating Procedures for encountered OEW are found in SOP-1 in Appendix B.

4.4 OEW ACCOUNTABILITY AND RECORDS MANAGEMENT

The Field Activity logbook, maintained by the Site Superintendent, will provide a daily journal of activities associated with the project site. It shall be opened upon first arrival for field operations and closed after demobilization at the project site. The Field Activity logbook is an official record of activities being performed and will contain, at a minimum, the following data:

- Date
- Daily weather conditions
- Safety meetings
- Start and stop times
- Personnel assigned and job classification
- Work stoppages
- Equipment used and number of hours in use
- Injuries to personnel
- Damage to equipment
- Official communication, written or verbal
- Quantity and type of OEW and OEW-related items encountered and their precise location, orientation as discovered, fusing, potential explosive content, and disposition

- Transportation activities
- A listing of all personnel involved with site activities
- A detailed description of all deliveries and/or shipments to or from the site
- Summary of major communications with the FWENC PjM, Navy RPM, ECM, or regulatory agency representatives
- Handling, transport, or storage of OEW discovered
- The time required to clear the IR Site, and the vegetation and terrain encountered
- Other pertinent data as required by the RPM or ECM
- Any problems encountered
- Signature of the Site Superintendent indicating that the recorded information and data are true and correct

4.5 GEOTECHNICAL INVESTIGATION

Detailed procedures for performance of field exploration activities and sampling methods are provided in Appendix B, SOP-2, Drilling, Geotechnical Sampling, and Testing. Metal avoidance procedures will be used for test pit excavation and borehole drilling activities and can be found in SOP-2 and SOP-3 in Appendix B.

A total of ten soil borings, 14 CPTs, and eight test pits are proposed for IR Site 1. Five of the borings will be off-shore and five will be on land. The offshore borings shall be used to assess the stability of the dikes and materials behind them. Representative, disturbed, and undisturbed soil samples will be retrieved for geotechnical analyses. No chemical analyses will be performed during the focused remedial investigation; however, soil and/or water may be analyzed for waste disposal as described in Section 7.0. CPT soundings will be performed along the perimeter dike on the northern and western sides of the site at approximately 300-foot spacing to provide an approximately continuous representation of the site soils profile and in-situ strength properties. CPT soundings will be performed in accordance with American Society for Testing and Materials (ASTM) Test Method D 3441. For quality assurance, two CPTs will be advanced near two HSA borings to check CPT test results (soil stratification and penetration resistance) against soil layering and blow count information on boring logs. Figure 4-2 shows the locations of the various soil borings and test pits.

HSA and CPT soil exploration will be performed along five transects, two borings and one CPT per transect (one offshore, one upland near shoreline, and one on top of the existing dike). Initially, each HSA boring will extend approximately 50 feet into soil or sediments to confirm drilling into native soil, based on the existing information on the site soil stratigraphy (TtEMI, 1999), and to obtain geotechnical data to adequately address the depths of critical potential failure surfaces in slope stability analyses and potential liquefiable soil layers. Two to three borings will be drilled deeper to penetrate through Younger Bay mud and into San Antonio

and/or Merritt formations to evaluate shear strength and compressibility properties of both Younger Bay mud and granular soils. Figure 4-3 shows a schematic cross-section of typical depths of exploration. The offshore HSA borings will be performed using a drilling rig on a barge with a tug; upland borings will be drilled using a truck mounted HSA rig. Collection of groundwater level measurements will be used for analysis of dike stability and bearing capacity.

Test pits will be excavated to measure the thickness of soil over the refuse and for collection of bulk soil samples. Each pit will be approximately 2 to 4 feet deep, depending on where landfill debris is encountered, and will be backfilled with the excavated soil.

4.5.1 Soil Boring Activities

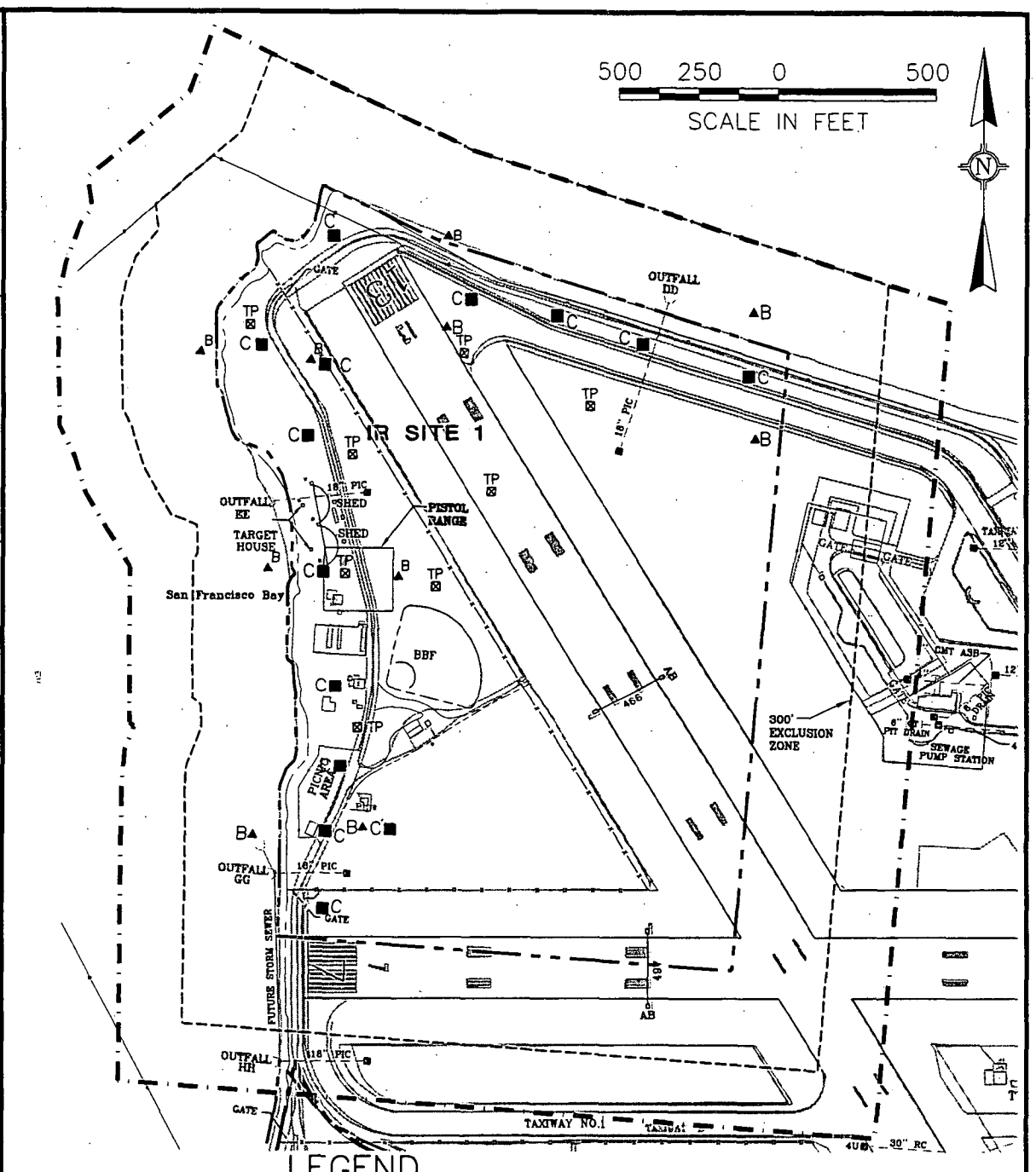
For both upland and offshore borings, the standard sampling interval for drive samples is anticipated to be every 5 feet. If there are zones of soft, fine-grained soil or sediment, Shelby tube samples may be taken in place of and/or in addition to drive samples.

General procedures to be followed for soil borings are as follows:

- Check location, elevation, and boring number on topographic map
- Take pre-activity photographs of the exploration location to document environmental conditions
- Establish safety zone around drill site
- Set up health and safety monitoring equipment
- Follow procedures for metal avoidance
- Continuously check the drill cuttings or augered soil cuttings to note changes in strata
- Refer to ASTM D-2488 for standard practice for identification and description of soils
- After the drilling is completed, cement bentonite grout will be used to fill the borings
- Take post-activity photographs of the exploration location to document any changes in environmental conditions as a result of drilling/excavation activities

The procedures for offshore borings are the same as upland, except that the location is recorded with DGPS. Depth to mudline is measured with a lead-line and water surface elevations recorded from the tide gauge. No photographs will be taken. Metal avoidance procedures will not be required for offshore borings.

Borehole abandonment shall be performed according to the *Water Well Standards: State of California,* Bulletin 74-81, December 1981, p. 68 (Sealing Methods), which details procedures for performing the grout (tremie) pipe method.



LEGEND

- ■ C — PROPOSED CPT
- ▲ B — PROPOSED HOLLOW-STEM AUGER BORING
- ⊠ TP — PROPOSED TEST PIT
- LIMITS OF BATHYMETRY TOPOGRAPHY SURVEYS
- FENCE LINE
- EXCLUSION ZONE
- SITE BOUNDARY

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Figure 4-2
IR SITE 1 EXPLORATION LOCATIONS & SURVEY AREA
ALAMEDA, CA

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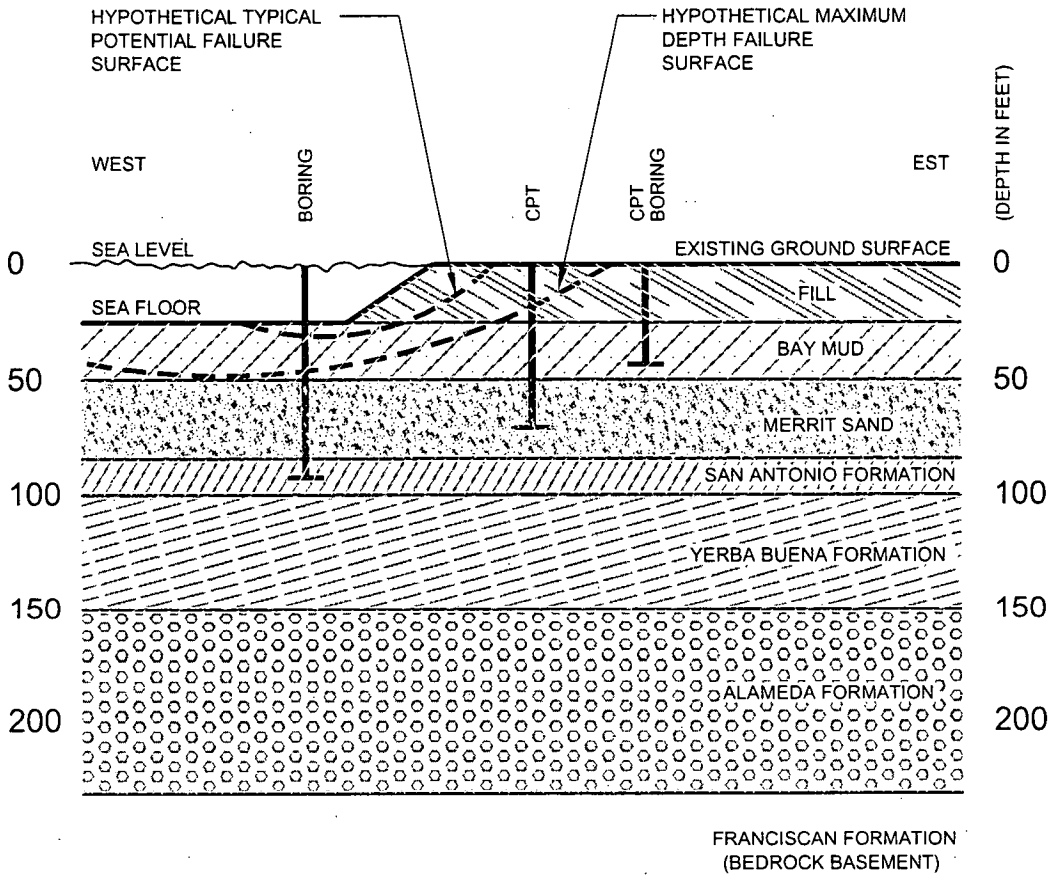

NOTES:

1. ALL DEPTHS ARE APPROXIMATE AND MAY VARY ACROSS THE WIDTH AND LENGTH OF THE SITE.
2. BORING DEPTHS REPRESENT TYPICAL EXPECTED DEPTHS; NOT ALL OFFSHORE BORINGS WILL BE TO 100 FEET AND NOT NOT ALL ONSHORE BORINGS WILL TERMINATE AT 50 FEET DEPTHS.

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Figure 4-3
SCHEMATIC GEOLOGIC CROSS-SECTION SHOWING APPROXIMATE EXPECTED DEPTHS OF BORINGS

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Upland borehole abandonment shall be performed according to the *Water Well Standards: State of California,* Bulletin 74-81, December 1981, p. 68 (Sealing Methods), which details procedures for performing the grout (tremie) pipe method.

Soil Boring Logs

FWENC Geotechnical Engineer will oversee the logging of the borings. No downhole logging will be performed. Each soil boring will be logged using a field boring log form. Soil descriptions will follow Uniform Soil Classification System (USCS) guidelines. Soil boring logs will contain the following general site-specific information requested in the "header" on the log form as specified in ASTM D2488:

- Physical characteristics of soil according to USCS
- Observed soil type
- Stratigraphic boundaries
- Geologic structures/discontinuities (faults, joints, beddings)
- Soil color, soil moisture
  (Munsell Soil Color Charts will be used to define the soil color)
- Odors (if any, and precautionary measures taken)
- Organic vapor analyzer (OVA) readings
- Depth of samples taken
- Information on borehole diameter and weight and drop height of drive hammer

4.5.2 Test Pit Activities

Eight test pits are to be excavated at IR Site 1 to determine the thickness and composition of the landfill cap. A backhoe with an 18- to –24 inch-wide bucket will be used to excavate the test pits and the depth of the pits will be determined by their location on the site. Metal avoidance procedures will be used during test pit excavations. The apparent depth of cover in any of the seven landfill cells in the site is 2 feet while test pits in non-landfill areas will be excavated to a depth of approximately 4 feet below ground surface (bgs) or refusal. Bulk sampling will be performed at various intervals based on soil conditions encountered in test pits. Approximately two samples will be collected per test pit, with locality selected based on materials encountered. Materials that have sloughed down into the test pit will be avoided when collecting a test pit sample. General work procedures to be followed are as follows:

- Check location, elevation, and test pit number on topographic map.
- Take pre-activity photographs of the exploration location to document environmental conditions.
- Establish safety zone.

- Excavate using metal avoidance procedures.
- Excavate test pits perpendicular to slope contours.
- Excavate test pits to a depth of approximately 2-4 feet bgs (depending on location) and no more than 10 feet in length.
- Collect bulk soil samples from the backhoe bucket with a hand trowel and sample bags in each significant soil type observed in the test pit. Samples will be classified in accordance with ASTM D2487 and D2488. If the soil is homogenous, then sample at 2-foot vertical intervals.
- Log excavated soils in accordance with ASTM D-2488.
- Map walls of test pits noting subsurface features including voids, oversized rock, rooting depth, root channels, depth of saturation, and cracks. Mapping will be done from the surface. Field personnel will not enter test pits.
- Photograph test pit walls.
- Make detailed observations of changes in soil moisture and note depth of water seepage into the pit (if any).
- Make detailed observations of any waste that might be encountered.
- Backfill test pits with excavated material, place in thin layers, and tamp with the backhoe bucket.
- Take post-activity photographs of the exploration location and test pit sidewalls to document any changes in environmental conditions as a result of drilling/excavation activities.

Test Pit Logs

FWENC Geotechnical Engineer will oversee the logging of the test pits. No down-hole logging will be performed. Test pits will be logged using a trench log. Soil descriptions will follow USCS guidelines. The procedures for completing the field test pit log forms are described below:

- Fill in information in heading.
- Provide physical characteristics of soil according to USCS.
- Provide observed soil type.
- Provide stratigraphic boundaries.
- Describe soil color, soil moisture
  (Munsell Soil Color Charts will be used to define the soil color).
- Identify odors.
- Photograph test pit walls.
- Provide OVA readings.

- Provide depth of samples taken.
- Test pit logs will contain a sketch of the test pit wall showing depth of root penetration, root channels, voids, moisture front, and cracks. The sketch should also identify soil types, horizons, and cross-reference symbol to soil descriptions.

4.5.3 Exploration Termination Before Reaching Planned Depth

In the event that an obstruction or other cause prevents exploration advancement, the borehole/test pit will be abandoned. Shallow test pits above the water table will be backfilled with soil cuttings to grade. Procedures for borehole abandonment established in the *State of California Water Well Standards*, (1981) Bulletin 74-81, Section 23 will be followed. The exploration equipment will be moved a few feet to drill/excavate a replacement boring/test pit (after making sure the new location is cleared of metal, underground utilities, and is biologically cleared, if needed). The decision to perform a replacement boring/test pit will be based on previous exploration efforts and will be made by the PjM or designee. If the replacement boring/test pit fails to reach the required depth due to obstruction or refusal, the replacement exploration will be backfilled/sealed and the geotechnical engineer will inform the PjM.

4.5.4 Sampling Procedures

Soil samples will be obtained at the intervals specified in the preceding sections. Sampling intervals may be changed under the direction of the geotechnical engineer. If a sample is not recovered, another attempt will be made directly below the unsuccessful sample interval. Soil samples that represent soil that has the proper characteristics and is available in sufficient volume will be submitted for laboratory testing.

Geotechnical Laboratory

Soil samples with potentially high levels of contamination may be collected on Site 1. Laboratories screened to analyze these samples will have been provided a list of contaminants-of-concern based on environmental data already obtained from the site to ensure they are equipped to manipulate samples with high concentrations of contamination.

Drive and Push Samples

A combination of sampling methods and samplers will be used including standard penetration test (SPT) drive sampler, California Ring drive sampler and thin-walled tube push samplers. Sampling will be conducted in general accordance with ASTM D-1586, ASTM D-3550-84 and ASTM D-1587-94 procedures, respectively. Samples will be collected as follows:

- After the boring has been advanced to the desirable sampling depth, excessive cuttings will be removed from the bottom of the borehole. The SPT and Ring drive samplers will be alternated at 5 feet intervals. The sampling assembly will be lowered to the sampling depth. Using a down-hole hammer, a sample will be collected when

the sampler has been advanced approximately 12 to 18 inches. The number of blows, hammer weight, and drop height will be recorded on the soil boring log. HSA drill rigs equipped with automatic hammers will be used that provide control over driving forces and number of blow counts to ensure test results consistent with industry standards. The soil sample will be retrieved and soil description recorded. An OVA headspace reading will be collected from a portion of the sample contained in either the sampling "shoe" or sleeve. If refusal is encountered while sampling, the boring will be advanced a few feet to attempt collecting a sample. The following two criteria can be used to define refusal:

  - A total of 50 blows have been applied
  - There is no observed advancement of the sampler during ten successive blows

- When soft clays are encountered, the drive sample will be followed by a thin-walled push sampler (that is, Shelby tube). These tubes will be pushed approximately 24 inches.

Bulk Samples

Bulk samples will be collected from soil cuttings at each of the upland borings and from sidewalls of the test pits. A minimum of 75 pounds of soil will be collected from the cuttings at each upland boring location (to provide sufficient sample for one Proctor test per two borings). A minimum of 20 pounds will be collected from each major soil type at each test pit location (to provide sufficient sample for one Proctor test per four test pits).

Bulk samples will be placed into moisture-proof bags with a hand trowel. The bags will be twisted and taped closed, and a twist tie identification label will be fixed to the bag. For each bulk sample, a representative split sample of about 1 pound will be placed onto a plastic bag or sample jar. An OVA headspace reading will be collected from the headspace in the small bag or jar.

4.5.5 Sample Documentation and Labeling

Collected soil samples will be documented on a sample-tracking log. Entries will include the following information, as applicable:

- Name of Sampler
- Sample Identification Number(s)
- Date and Time of Collection
- Field Observations

A proper label will be affixed to each soil sample. Sample labels will be securely placed on or affixed to sample containers by the field geologist. Information to be entered on each label in indelible ink includes the following:

- Sample Identification Number
- Description of Sample
- Depth of Sample
- Date and Time of Sample Collection
- Name of Sampler
- Project Identifier (DO Number)

4.5.5.1 Sample Identification

Soil samples will be assigned an alphanumeric identifier to differentiate them from other collected soil samples. Each soil sample identification will contain the following six components:

1. The first component of the identifier is the DO Number (DO0095).
2. The second component of the identifier is the number (sequential) of the sample taken.
3. The third component of the identifier corresponds to the sample location. Samples collected from IR Site 1 will be identified as IR1.
4. The fourth component corresponds to a sampling method; "B" for soil borings and "TP" for test pits followed by a location number.
5. The fifth component of the identifier will distinguish between sample types; "BS" for bulk samples and "DS" for drive samples.
6. The sixth component will be a number that is the depth (D) to the sample measured in feet below the ground surface.

The sample collection depths will be recorded in the field logbook in addition to being entered on the chain-of-custody (COC) form. The COC form contains an entry specifically for recording sample depths. Below are examples of various sample identifications to be used for IR Site 1:

DO0095-001-IR1-B1-BS-D2.5

(DO0095 - number 1 - IR Site 1 - boring location 1 - bulk sample - sample depth 2.5 feet)

DO0095-002-IR1-TP1-DS-D5.0

(DO0095 - number 2 – IR Site 1 - test pit location 1 - drive sample - sample depth 5 feet)

DO0095 – 003-IR1-B2-BS-D10.0

(DO0095 – number 3 – IR Site 1 – boring location 2 – bulk sample – sample depth 10 feet)

4.5.5.2 Sample Containers

Drive samples taken with the California-modified drive sampler will be retained in six 1-inch-high brass storage sleeves and placed in a containment canister that will be sealed with plastic end-caps. Bulk samples (that is, those collected from cuttings by shovel) will be placed in soil sampling bags, twisted closed, and taped shut. A minimum of 75 pounds of soil will be collected for each bulk sample.

4.5.6 Field Documentation

At a minimum, sampling information will be recorded on a COC form and in a field logbook. Both documents will be completed in the field at the time of sample collection. In addition, field activity reports and/or appropriate monitoring datasheets will be completed at the time of the activity or immediately thereafter. All entries will be legibly recorded in indelible ink.

4.5.6.1 Chain-of-Custody

Soil samples are required to be handled and transported using a COC form. The COC provides the means to identify and track the COC of each individual soil sample from the point of collection through data analysis. The following procedures will be carried out:

- A COC record is required for each shipment of samples. Daily shipments are anticipated. The record is to be completed in indelible ink. Changes or corrections to the record consist of line-out deletions (for example, no "white-out" correction fluid) which are initialed and dated by the author of the change or correction.
- The COC record will be completed by a field engineer/geologist who performed and/or witnessed the sample collection activity. After completion of the record down through the initial "Relinquished by:" row, the top two copies will go to the lab and the bottom two copies of COC will be retained for records.
- The person relinquishing the samples to the courier retains a copy of the shipping paper.
- The laboratory representative who accepts the incoming sample shipment at the receiving laboratory will complete the first incomplete "Received by:" row on the COC record to acknowledge receipt of the samples. This signed original will be returned with the analytical reports.
- The laboratory representative who accepts the incoming sample shipment at the receiving laboratory will inspect the samples. If there is any apparent discrepancy or potential anomaly, the samples will not be logged in for testing until the issue is resolved through contact with the originating field geologist or his/her PjM. The laboratory will provide such notification by the most expedient method (for example, telephone and/or facsimile) followed by a written notification. A complete copy of the issue and its resolution will be documented and provided by the laboratory with the test reports.

4.5.6.2 Field Logbooks

A bound, field logbook with consecutively numbered pages will be assigned to this project. All entries will be executed in indelible ink. Corrections will be made by crossing out erroneous data with a single line and dating and initialing the entry. At the end of each workday, the responsible sampler will sign the logbook pages and any unused portions of logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the logbook will contain the following information:

- Project name and location
- Date and time
- Personnel in attendance
- General weather information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, sample depth, type of analysis, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for the field instrumentation
- Problems encountered and corrective actions taken
- Quality control (QC) activities
- Verbal or written instructions
- Any other events that may affect the samples

4.5.6.3 Document Correction

Changes and corrections on any project documentation and data will be made by crossing out the wrong information with a single line, and writing the new information immediately above the crossed-out information, using permanent (indelible) ink and legible handwriting. The original item, although erroneous, must remain legible beneath the cross-out. The person making the correction will initial and date the correction.

4.5.7 Geotechnical Testing

Geotechnical laboratory testing will be performed on selected soil samples as described in Table 4-1. Laboratory testing will consist of moisture/density, particle-size analysis with hydrometer, Atterberg Limits, organic content, Modified Proctor compaction, triaxial permeability, and triaxial shear tests. The Modified Proctor compaction and triaxial permeability tests will be performed if existing cover soils are determined to contribute significantly to the hydraulic performance of the final cover system. This is determined based on the results of the

field tests and laboratory in-situ density/moisture content and index property measurements. These tests, if needed, will be performed on four composite specimens obtained by mixing soil samples generally representative of predominant near-surface soil conditions at the site to provide average hydraulic conductivity properties of the existing cover soils. The saturated hydraulic conductivity tests will be performed on soil samples with densities simulating the estimated "in-place" (average existing) and "after-compaction" (foundation layer for a new cover) conditions.

The scope of laboratory testing and the test methods to be used are shown in Table 4-1.

TABLE 4-1

LABORATORY TESTING AND TEST METHODS

Test	Method	Sample Type and Quantity	Approximate Number	Total Sample Quantity
Atterberg Limits	ASTM D-4318-95a	Grab - 1 pound	4	4 pounds
Compaction Characteristics Using Modified Effort (Modified Proctor) (if needed)	ASTM D-1557-91	Grab - 40 pounds	4	160 pounds
Moisture/Density	ASTM D-2937-00 ASTM D-2216	One-inch high sample sleeve	12	12 sample sleeves
Organic Content	ASTM D-2974-00	Grab -1/2 pound	6	3 pounds
Particle Size with Hydrometer	ASTM D-422-63	Grab - 1 pound	12	12 pounds
Saturated Hydraulic Conductivity (if needed)	ASTM D-5084-90	Grab 20 pounds	4	80 pounds
Unconsolidated, Undrained Triaxial Shear	ASTM D-2850-95	3-inch diameter by 6 inches high	2	4 pounds*
Consolidated, Undrained Triaxial Shear	ASTM D-4767	3-inch diameter by 6 inches high	6	13 pounds*
Water Contents	ASTM D-2216-92	Grab - ½ pound	20	10 pounds

Notes:

* Assumption: soil is a saturated soft organic clay.

Samples (that is, drive and bulk samples) sent to the laboratory will be logged in and stored for testing assignments. Drive samples will be visually classified (ASTM D-2488) and selected drive samples will be prepared for moisture-density determinations (ASTM D-2937) and particle-size analysis ASTM D-422. Once a sufficient number of drive samples have been tested and correlations developed, hydraulic conductivity testing will be initiated. Assignments of saturated triaxial permeability tests will be done by the PjM with the assistance of the Certified Engineering Geologist and Geotechnical Engineer.

Test results will be presented in a "report quality" format from the subcontracted laboratory with summary tables in an electronic format. The laboratory report will be signed and stamped by the laboratory's Geotechnical Engineer and reviewed by FWENC. Electronic deliverables will satisfy Navy Environmental Data Transfer Standards (NEDTS) requirements.

Samples will be picked up on a daily basis from the site, specific location pending. Pickup service will include both drive and bulk samples. Sample retention period will be 60 days following the final reporting date for all drive and bulk samples. In addition, up to 20 selected bulk samples will be retained for a period of 1 year.

4.5.8 Seismic Field Evaluation

As described above in Sections 1.2.3, if adequate information on subsurface soil properties is not available, testing will be conducted to provide supplemental data. Prior to starting the field testing, detailed information will be provided for preparation of sampling and work plans if seismic refraction surveys with SASW analysis and/or CPT are required. Information shall include the number, length, orientation, and layout of each refraction survey array, and location, total depth, and sensor depth for the CPT investigation. CPT soundings will be performed on IR Site 1 every 300 feet apart. Further details of performance of CPT soundings are provided in Appendix B, SOP-2, Cone Penetrometer Testing.

4.6 SUBCONTRACTOR MANAGEMENT

FWENC will engage the services of several specialty subcontractors on this project. FWENC's methods and procedures for management of specialty subcontractors will be used to ensure that activities performed by subcontractors are in full compliance with the scope of work and do not adversely impact the project cost or schedules. The subcontractors for this project will be limited to a land surveyor, a drilling company, a waste transporter, and a marine service (barge/tug boat) company. The subcontractors will provide services related to surveying, field exploratory/ drilling, and offshore activities.

5.0 REGULATORY FRAMEWORK

5.1 REGULATORY APPROACH

The purpose of this section is to identify the potential ARARs and requirements "to be considered" (TBCs) for the investigation and management of OEW waste at IR Site 1, OU-3 of former NAS Alameda. FWENC intends to conduct the project activities in accordance with these ARARs and TBCs.

The surface and subsurface characterization, geotechnical and seismic evaluations at former NAS Alameda is part of a RI/FS being conducted consistent with the CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). In accordance with CERCLA Section 121, actual permits will not be required for on-site work. Rather, substantive compliance with the selected ARARs/TBCs must be achieved. It should be noted that the selection of ARARs/TBCs is an iterative process that will evolve throughout the various phases of the project.

5.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND REQUIREMENTS TO BE CONSIDERED

Pursuant to CERCLA and the NCP, removal actions shall comply with and upon completion attain ARARs to the extent practicable considering the exigencies of the situation. Applicable requirements are defined by the NCP [40 Code of Federal Regulations (CFR), Part 300.5] as those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal or state environmental, and facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are defined (40 CFR, Part 300.5) as those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal or state environmental and facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance found at a CERCLA site, address problems or situations sufficiently similar to those encountered at CERCLA sites and that their use is well-suited to a particular site. A requirement that is relevant and appropriate must be complied with to the same degree as if it were applicable. In addition to ARARs, the lead agency may, as appropriate, identify other advisories, criteria, or guidance TBCs. It is important to note that only those state standards which are identified by the state in a timely manner that are more stringent than the federal requirements may be considered ARARs [40 CFR, Part 300.400(g)(4)].

ARARs may be categorized as chemical-, location-, or action-specific:

- Chemical-specific ARARs set health or risk-based concentration limits or ranges, in various environmental media for specific hazardous substances, pollutants, or contaminants.
- Location-specific ARARs set restrictions on activities within specific locations, such as wetlands and floodplains, and depend on the characteristics of a site and its immediate environs.
- Action-specific ARARs set controls or restrictions on particular kinds of remedial activities that may be selected to accomplish a remedy. These ARARs may specify particular performance levels, actions or technologies to be used to manage hazardous substances, pollutants, or contaminants.

Activities conducted entirely on-site need only comply with the substantive aspects of ARARs and not the administrative aspects such as permitting [specifically exempted under CERCLA Section 121(e)] or administrative reviews. Administrative procedures are not considered ARARs and, therefore, need not be pursued during the planning or implementation of removal actions.

Although no activities are planned to occur outside of the boundary of the former NAS Alameda, it should be noted that off-site activities are not controlled by ARARs, but rather must comply with all necessary federal, state, and local requirements. Occupational Safety and Health Administration (OSHA) requirements are also not considered ARARs pursuant to the EPA adopted final rule on the NCP. However, the NCP identified certain OSHA requirements which must be complied with during all CERCLA response actions (that is, 29 CFR, Parts 1910 and 1926).

5.3 DISCUSSION OF POTENTIAL ARARS/TBCS

Potential ARARs were identified and evaluated as chemical-specific, location-specific, and action specific and consist of the following:

5.3.1 Chemical-Specific ARARs/TBCs

Ordnance/Explosives Waste (OEW). Under 40 CFR, Part 261.23 (a) (8) recovered OEW is considered RCRA hazardous waste and the requirements specified in the "Action-Specific" section apply.

5.3.2 Location-Specific ARARs/TBCs

IR Site 1 is located in an area that contains a limited diversity of terrestrial natural resources. There are no identified wetlands or historical observances of listed or sensitive species within the boundaries of IR Site 1. The conservation of terrestrial natural resources will not be addressed within this plan due to the large-scale surface disturbance anticipated during proposed future construction at IR Site 1. Site 1 is currently not a wildlife refuge and there are no plans to make it

one. There are no wetlands or listed and sensitive species at Site 1 and it is 2/3 of a mile from the Least Tern nesting area.

The following Federal and State laws and regulations will be considered and complied:

- **Migratory Bird Treaty Act of 1918** [16 United States Code (USC) 703-712; Chapter 128]. This act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. Several species of migratory birds occupy the remediation areas. Specific mitigation measures to be taken to minimize potential impacts to migratory birds are presented in the Environmental Protection Plan (EPP) (Section 6.0).
- **National Wildlife Refuge System Administration Act** [(NWRSA) Title 16, Chapter 5A, subchapter III, §668d]. The NWRSA is applicable because it prohibits the disturbing, injuring, cutting, burning, removing, destroying, or possessing of any real or personal property of the United States, including natural growth in any area of the System, or take or possess any fish, bird, mammal, or other wild vertebrate or invertebrate animals, or part, or nest, or egg thereof within any such area, or enter, use, or otherwise occupy any such area for any purpose, unless such activities are performed by persons authorized to manage such area, or unless such activities are permitted with authorization from refuge managers, or by express provision of the law.
- **California Fish and Game Code** (§ 1600, 1601, 1603, 2014, 2080, 3005 and 5650). These regulations enforcing responsibility and damages for negligently destroying wildlife, the illegal taking of endangered/threatened species, other birds and mammals and the discharge or release of hazardous materials into California waters are all relevant ARARs.

5.3.3 Action-Specific ARARs/TBCs

Department of Defense and Navy Publications

Potential action-specific ARARs/TBCs focus primarily on the management of OEW as a potentially reactive (D003) hazardous waste. Because the remediation project is being conducted on a BRAC site, Department of Defense (DoD) and Navy publications govern the handling, storage, transportation, clearance, and disposal requirements for UXO. They broadly apply and are applicable to all UXO activities on Federal Property as follows:

- ***U. S. Navy Manual NAVSEA OP-5.*** Ammunition and Explosives Ashore Safety Regulations for Handling, Storing, Production, Renovation and Shipping
- ***DoD Instruction 4145.26M.*** *DoD Contractor's Safety Manual for Ammunition and Explosives*
- ***DoD 6055.9-STD.*** DoD Ammunition and Explosives Safety Standards, DoD Explosive Safety Board (DDESB)

- ***Final Management Principles for Implementing Response Actions at Closed, Transferring and Transferred Ranges Action Memorandum.*** United States Army Corps of Engineers

RCRA and California Hazardous Waste Control Act ARARs/TBCs

Hazardous wastes managed in accordance with the substantive requirements of the RCRA and California Hazardous Waste Laws are likely ARARs as follows:

- Generator requirements (40 CFR, Part 262; 22 CCR, Section 66262)
- Transportation requirements (40 CFR, Part 263; 22 CCR, Section 66263)
- On-site OEW storage/hazardous waste stockpile/storage area design and operation requirements (40 CFR, Part 262.250)

U.S. Department of Transportation (DOT) ARARs/TBCs

Department of Transportation (DOT) requirements which are potential ARARs include:

- Classification, packaging, and labeling requirements for the on-site transportation of hazardous materials on any public roadway (49 CFR, Part 171-180)
- Identification, shipping, packaging and container selection for OEW destined for off-site treatment, storage or disposal (49 CFR, Parts 172, 173, and 178)

Other Federal/California ARARs/TBCs

Other federal agencies' requirements that are potential ARARs include:

- **Military Munitions Rule** (MMR) (40 CFR, Parts 260 through 270). Requirements for waste military munitions (WMM), transportation, treatment, and disposal of WMM and response to WMM/explosive emergencies

5.4 REGULATORY AGENCY NOTIFICATION

The following regulatory agencies will be notified at least 60 days prior to the start of any operations on IR Site 1:

- NAS ECM/Caretaker
- EPA
- RWQCB
- DTSC
- The City of Alameda

6.0 ENVIRONMENTAL PROTECTION PLAN

This EPP encompasses IR Site 1, OU-3 former NAS Alameda, Alameda Point, Alameda, California. A brief description of IR Site 1 is presented in Section 2.0 of the Focused RI Work Plan. IR Site 1 is located at the westernmost edge of Alameda Point (see Figure 1-1) and is bordered on the west and the north by the San Francisco Bay and the former NAS Alameda on the east and the north. IR Site 2 is located approximately 1/3 of a mile south of IR Site 1.

6.1 INTRODUCTION

This EPP has been developed to identify and protect sensitive natural resources during OEW investigation, and geotechnical and seismic evaluation operations. This EPP was developed by documenting future commercial reuse projects scheduled at IR Site 1, as well as identifying potentially sensitive resources within the area.

IR Site 1 is located in an area that contains a limited diversity of terrestrial natural resources. There are no identified wetlands or historical observances of listed or sensitive species within the boundaries of IR Site 1.

No mitigation guidelines will be mandated within this plan for IR Site 1 due to proposed future development of the area as a golf course after conclusion of OEW remediation activities. The conservation of terrestrial natural resources will not be addressed within this plan due to the large-scale surface disturbance anticipated during proposed future construction at IR Site 1. Future construction activities are to include the placement of 4 feet of fill as landfill cap cover over areas of refuse, and an additional 4 feet of fill and contouring for golf course development.

The investigation sample areas/drilling sites at IR Site 1 will not be required to be field-verified by a FWENC biologist to minimize potential disturbance to natural resources.

6.2 ENVIRONMENTAL ISSUES AND CONCERNS

IR Site 1 consists of approximately 40 acres of paved runway areas, nonnative grasslands, disturbed areas, and an old jogging trail. Ryegrass, yellow sweet clover and common plantain dominate the nonnative grasslands. The disturbed areas contain uninhabited buildings, building foundations, and the former pistol range. Grasses are the dominant vegetation in this area and feral rabbits the dominant animal species. Black-tailed jackrabbits, Canada geese, and European starlings are the dominant animal species at IR Site 1.

The runway tarmac approximately 1/2 mile southeast of IR Site 1 provides an important nesting habitat for sensitive species such as the California Least Tern (*Sterna antillarum browni)*. This area falls outside the boundaries established for IR Site 1, and will not be impacted by the OEW investigation/investigation activities previously discussed within the Work Plan.

There are no listed or sensitive species identified as inhabiting the area within the boundaries of IR Site 1.

6.3 POTENTIAL IMPACTS OF INVESTIGATION/SURVEY OPERATIONS

The investigation activities proposed by FWENC could potentially impact sensitive biological resources at the Alameda Point. By implementing environmentally sensitive methods, potential impacts to these resources can be minimized. Section 6.4 describes the proposed measures FWENC shall implement during all phases of the investigation/investigation to minimize or mitigate potential impacts.

6.4 IMPACT MINIMIZATION MEASURES

The procedures outlined in this section will be implemented by the FWENC Site Superintendent to minimize environmental effects of the action. Procedures for the OEW investigation, and geotechnical survey and seismic evaluation will be implemented in compliance with all applicable federal and state regulations, including those that protect air, water, land, human health and safety, and cultural and biological resources.

6.4.1 Reasons for Mitigating Actions

Section 7 of the Endangered Species Act (ESA) requires all federal agencies to "utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species...". Conservation is defined as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point where the measures provided pursuant to this Act are no longer necessary." Under terms of Sections 7(b)(4) and 7(o)(2), adverse modification of habitat or taking that is incidental to and not intended as part of the agency action may be approved provided that such taking is in compliance with an incidental take statement. The planned actions have been discussed with the appropriate regulatory authorities.

6.4.2 Worker Education Briefing

Before the start of any activities, all on-site personnel will be briefed on health and safety issues and the need for minimizing impact on sensitive biological resources. Methods for avoiding and minimizing potential impact on the species and communities of concern will be stressed during the on-site training.

6.4.3 Mitigation by Avoidance

Due to future construction disturbance following OEW remediation activities, surveys will not be conducted on IR Site 1 to identify sensitive biological resources, and concerns.

6.4.4 Wildlife Protection

Terrestrial wildlife species most susceptible to project activities include migratory waterfowl and shorebirds, small mammals, and ground-dwelling birds. A biologist will determine if nesting is evident during the periods before or after the nesting season, prior to the inception of any clearing activities. No detonation activity will be conducted in the vicinity of nesting grounds during the nesting season.

If OEW investigation/investigation activities continue into the designated California Least Tern nesting season, mitigation measures will be implemented to reduce disturbance to the nesting populations adjacent to IR Site 1. This shall restrict all vehicle traffic to a minimum of 100 feet from documented nesting sites. Operations personnel on foot shall be restricted to a minimum of 500 feet from nesting sites.

6.4.5 Plant and Plant Community Protection

No plant species found within the botanical ecosystem of IR Site 1 are listed. All vegetation will be mowed to a maximum height of 4 inches to facilitate the surface OEW clearance and intrusive investigation. Topsoil removed during intrusive excavation operations will be replaced in the order it was removed. Excavated areas will not be reseeded due to scheduled construction activities following OEW remediation activities.

Trees will be pruned on a case-by-case basis and only as required to accomplish the tasks as outlined in this Focused RI Work Plan. No tree removal is required to perform the OEW surveys at IR Site 1. Brush clearing may be required and will be dispersed to avoid hot fires and potential soil sterilization should a controlled burn be used in the future.

6.5 MONITORING

Although natural resource mitigation measures will not be implemented during the course of activities at IR Site 1, monitoring personnel will be on-site during the initial ground disturbing activities to oversee and record activities resulting in terrestrial disturbance.

Monitoring reports will be prepared for each site visit.

7.0 WASTE MANAGEMENT PLAN

This Waste Management Plan (WMP) was specifically developed to identify regulatory requirements applicable to the disposal of investigation PPE, decontamination water, and other materials generated during the OEW investigation, and seismic and geotechnical evaluation activities to be conducted at IR Site 1. The WMP details the waste management practices, documentation, and training requirements that are necessary to ensure proper waste handling, transportation, and disposal. In addition, the WMP provides guidance regarding waste minimization practices to be followed during the project to reduce the volume of waste generated, stored, and removed from the site for disposal.

The WMP addresses the following anticipated regulated activities:

- Containerization, storage, and disposal of potentially non-RCRA hazardous and RCRA hazardous wastes generated in accordance with seismic and geotechnical survey activities. These wastes may include debris, PPE, and decontamination water.
- Sampling and analysis of waste materials for subsequent investigation, management, and disposal purposes.
- Assisting the Navy with identification of appropriate transportation companies and disposal facilities for wastes generated from the project activities (if required).
- Preparing materials, completing documentation, labeling, and placarding waste containers for transport to an appropriate offsite disposal facility.

7.1 REGULATORY REQUIREMENTS

Project activities may generate non-hazardous waste, non-RCRA hazardous wastes, and RCRA hazardous wastes. As such, the following federal and state regulations are applicable and must be complied with during implementation of planned project activities:

- California and EPA Regulations for Identification and Management of Hazardous Waste, 22 California Code of Regulations (CCR), Sections 66260 through 66299 and 40 CFR, Parts 260 through 299
- DOT Rules For Hazardous Materials Transport, 49 CFR, Parts 100 through 178
- Bay Area Air Quality Management District Regulations
- Applicable Navy and DoD Environmental Permits, Policies, and Procedures
- Appropriate best management practices (BMP) will be followed to control run-on/run-off and to minimize fugitive dust emissions during project activities

Environmental investigation and remediation of IR Site 1, OU-3 of former NAS Alameda is being conducted under the DoD Installation Restoration Program (IRP). Activities conducted under the IRP are to be performed in accordance with CERCLA and the NCP. Under Executive Order 12580, the Navy is the lead agency responsible for the cleanup effort, but the EPA, the Cal-EPA DTSC, and the RWQCB are involved in IRP oversight. This project is being conducted in support of an RI/FS for IR Site 1. The NCP requires that the substantive requirements of ARARs are followed; and compliance with administrative requirements is waived. Specifically, CERCLA response actions are exempt by law (as codified in Title 40 of the CFR, Part 300.400) from the requirement to obtain federal, state, or local permits related to any activities conducted on-site. In addition to federal requirements, promulgated state regulations are potential ARARs.

7.2 WASTE MINIMIZATION

In order to minimize the volume of waste, the following general rules will be applied:

- Contaminated materials will not be unnecessarily commingled with uncontaminated materials
- When practicable, material and equipment will be decontaminated and reused
- Volume reduction techniques will be utilized, as appropriate

7.3 PROJECT WASTE DESCRIPTIONS

Resultant waste streams associated with the project activities that may be encountered can be categorized as follows:

- Contaminated soil cuttings
- Uncontaminated soil cuttings
- Excavated soil
- OEW scrap
- Debris
- PPE

7.4 WASTE MANAGEMENT ACTIVITIES

This section describes in more detail how waste generated during project activities will be characterized and classified.

7.4.1 Waste Characterization/Classification

IR Site 1 is considered an area of contamination under the CERCLA program as administered by the EPA and the Cal-EPA DTSC. Soil cuttings and excavated materials will be stockpiled adjacent to their point of origin. These materials will eventually be re-graded into the soil surface

upon subsequent land reuse and development. The designation of IR Site 1 as an area of contamination (AOC) allows the placement of material generated during investigations within the same AOC without triggering land disposal restrictions.

Where a clear hazardous waste determination cannot be made, decontamination water generated from daily decontamination activities, PPE, and other debris (unless decontaminated) utilized during project activities, will be sampled and analyzed in accordance with federal and California Hazardous Waste Management Regulations and Solid Waste Management Regulations. A determination will then be made as to whether the materials are a characteristic hazardous waste based on the criteria for ignitibility, reactivity, corrosivity, or toxicity as defined in 22 CCR, Section 66261, Article 3.

7.4.2 Hazardous Waste Management

RCRA Subtitle C and the California Hazardous Waste Management Regulations govern hazardous waste management from the point of generation, through storage and treatment (if necessary), to its ultimate disposal. The Cal-EPA DTSC is authorized by the EPA to oversee management of the hazardous waste program in California. Hazardous waste must comply with the following requirements:

- Any waste generated during project activities that is required to be removed from the site for disposal must be characterized to determine whether it is a hazardous waste. Analytical testing requirements are detailed in Appendix B, SOP-2, Drilling, Geotechnical Sampling, and Testing.
- Hazardous waste must be managed in accordance with 22 CCR, Section 66262, Standards Applicable to Generators of Hazardous Waste.
- Hazardous waste transported off-site must be manifested in accordance with 22 CCR, Section 66262 Article 2, Manifests, and accompanied by land disposal restriction (LDR) certification notices as per 22 CCR, Section 66268.7, Waste Analysis and Recordkeeping.
- Hazardous waste must be stored in accordance with 22 CCR, Section 66265 Article 9, Use and Management of Containers, and/or 22 CCR, Section 66265 Article 10, Tank Systems.
- All containers and tanks of hazardous waste to be stored or disposed will be clearly marked with a completed hazardous waste label, indicating the starting date of accumulation, EPA identification number, EPA waste code, and so forth, and DOT markings.
- Hazardous waste may be stored in tanks or containers on-site for a maximum of 90 days. The 90 days begin on the date that the waste is first generated and containerized (that is, the day the first drop of waste is placed in a container).

- Hazardous waste must be disposed only at a hazardous waste disposal facility permitted for the disposal of the particular type of hazardous waste generated, and approved by FWENC and the Navy.

7.4.3 Waste Containerization and Storage

Container selection will be performed by DOT-trained personnel based on type and quantity of waste to be generated. Containers may include either DOT-specification drums or roll-offs for regulated hazardous material. DOT-specification containers are not required for material that does not meet a DOT hazard class.

Prior to commencing project activities, the FWENC Site Superintendent will, in conjunction with the ECM, select areas for the temporary staging and storage of excavated soil, investigation derived materials, decontamination fluids, and PPE. Where appropriate and feasible, these areas will include secondary containment.

Waste material must be classified according to California and DOT criteria before the labels are applied. Upon classification, each container will be marked and labeled as required. Trained personnel, as required by 49 CFR 172 Subpart H, will conduct all DOT functions.

At the time of generation, all waste containers will be labeled, using indelible ink, with the following information:

- Source and location
- Contents and quantity of material in the container
- Potential health, safety, and environmental hazards
- Accumulation start date (the date the first drop of material was put in the container)

Containers determined to contain hazardous waste will be immediately labeled with a completed commercial "HAZARDOUS WASTE" label, which will include the accumulation start date and other requested information. Containers for which additional characterization is necessary to make a waste determination will be labeled as "Potentially Hazardous Waste – Pending Analysis."

As practicable, hazardous waste stored in containers (that is, 55-gallon drums and roll-off bins) will also be stored on wooden pallets, if possible, and within a pre-designated waste storage area with secondary containment. An inventory of waste containers will be maintained for later submittal to and inspection by, Navy personnel, if required.

Containers of hazardous waste will be inspected and logged weekly while the fieldwork is in progress. Tanks containing hazardous waste will be inspected on a daily basis. Inspections will encompass evaluation for proper labeling, secure closure, the condition of each container/tank, number of containers/tank, and condition of the storage and secondary containment area. Any signs of deterioration, leaking, or significant dents will be noted, and containers will be

immediately over-packed or replaced, if necessary. Inspection results will be provided to the Navy, as requested. Wastestreams generated from site activities will be allowed to accumulate on-site for a period of time not to exceed 14 days from the first date of generation. Accumulated wastestreams will be evaluated on a weekly basis to profile for transportation and disposal by a waste disposal subcontractor.

7.4.4 Wastewater and Waste Fluids

The hazardous waste generator regulations referenced in 22 CCR, Section 66262 and 40 CFR, Part 262 contain applicable requirements for facilities that store hazardous wastes in tanks or containers for over 90 days. Decontamination water will be collected and stored within DOT-approved 55-gallon containers. Although anticipated to be non-hazardous, the containers will be managed and inspected in accordance with the substantive requirements of 22 CCR, Section 66265.173. These regulations require documentation of weekly inspections of the containers and the container storage area. In addition to these requirements, adequate secondary containment (that is, 100 percent of the container(s) volume plus the maximum rainfall from a 25-year, 24-hour storm event) will be implemented as a BMP. The contents of the container(s) will be characterized per the requirements of 22 CCR, Section 66261 to determine appropriate disposal options.

Waste fluids generated from heavy equipment maintenance activities will be collected and removed from the site by the maintenance contractor for recycling. Hazardous wastes containing free liquids have stringent secondary containment requirements. These requirements include:

- A base free of cracks or gaps and sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.
- The base will be sloped or the containment system will be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation. Alternatively, the containers may be elevated on pallets to prevent contact with accumulated liquids.
- The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater.
- Spilled or leaked waste and accumulated precipitation will be removed from the sump or collection area in a timely manner to prevent overflow of the collection system.

7.4.5 OEW Scrap

OEW scrap (shrapnel, fins, expended munitions) will be controlled and accounted for from discovery to disposal. Procedures for the accountability and disposition of OEW are found in Appendix B, SOP-1.

7.4.6 Used PPE and Other Debris

Pieces of metal, metal piping, liners, used PPE, and other debris that is capable of being decontaminated (treated) under the hazardous debris rule in 22 CCR, Section 66268.45, will be decontaminated and segregated in a lined stockpile or roll-off bin for subsequent disposal as non-hazardous waste. Used PPE and debris that cannot be effectively treated (for example, wood, PVC piping, and so forth) will be segregated in containers (drums or roll-off bins) and managed as hazardous waste in accordance with the substantive requirements of the container management regulations codified in 22 CCR, Sections 66264.170 through 66264.178 pending characterization and appropriate disposal.

7.4.7 Waste Accumulation Areas

Hazardous waste storage areas also require:

- A sign with the legend, "Danger Hazardous Waste Area-Unauthorized Personnel Keep Out" (written in English and Spanish), will be posted at each 90-day accumulation area in sufficient numbers to be seen from any approach. The signs will be legible from a distance of at least 25 feet.
- Aisle space will be maintained to allow the unobstructed movements of personnel, fire protection equipment, spill control equipment, and decontamination equipment into any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.
- The following emergency equipment will be located or available to personnel during active waste management activities at each accumulation area:
  - A device, such as a telephone or a hand-held two-way radio, capable of summoning emergency assistance will be available.
  - Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment will be available.

Bulk quantities of fuel, oil, or other hazardous materials will not be stored on-site. Equipment fueling and maintenance activities will be performed by an off-site contractor on an as-needed basis.

7.5 REPORTING SPILLS AND RELEASES

Precautions will be taken to prevent hazardous material spills. Informal daily inspections by site personnel of equipment, structure(s), and containers will be conducted. In addition, personnel using hazardous materials will inspect containers before and after use. In the event of a spill/release, the Site Superintendent will notify the Navy, and spill response will be conducted in accordance with the Base-Wide Health and Safety Plan and federal, state, and local regulations, and in accordance with Navy policies and procedures.

7.6 TRAINING/CERTIFICATION REQUIREMENTS

This section presents the DOT and waste management training and certification requirements for personnel involved in the project. Employees involved in waste management operations will be trained in FWENC's Waste Management and Environmental Compliance policies and procedures to ensure that they are familiar with the program. These policies and procedures meet Department of Justice requirements for a sound environmental management program and satisfy the hazardous waste management training requirements under 22 CCR, Section 66265.16. In addition, personnel who perform or oversee DOT-related activities will be DOT-trained. DOT and waste management training records will be maintained in FWENC's Corporate Department files and will be available, as necessary, to onsite personnel. Copies of all training certificates for FWENC and subcontractor personnel will be kept on-site during the course of all activities.

7.7 DOCUMENTATION AND RECORDS RETENTION

This section presents project requirements relating to documentation and records and their retention.

7.7.1 Documentation

The information contained in this section applies to all waste managed during project activities. Field records will be kept in the project files. Information to be recorded includes, but is not limited to, the following:

- Description of waste generating activities
- Location of waste generation (including depth, if applicable)
- Type of waste
- Date and time of generation
- Name of person recording information
- Name of field manager at time of generation and at time of disposal
- Test results
- Inspection logs
- Waste documentation, including:
  - Waste profile sheets
  - Land Disposal Restriction (LDR) certification
  - Hazardous waste manifest
  - Trip tickets or bills of lading
  - Copies of any state or local permits or approvals

7.7.2 Transportation

Transportation documentation will comply with DOT regulations 49 CFR, Parts 100 through 178 and will be prepared or reviewed by appropriately trained FWENC personnel.

Containers will be marked, labeled, and/or placarded prior to off-site transport. Treatment, storage, and disposal facility (TSDF) waste profile sheets, LDR notifications, waste manifests, and shipping documents will be submitted by FWENC personnel for the appropriate Navy officials to review and sign. Waste transporters used will be registered with the California DTSC and approved by the Navy and approved in accordance with FWENC procedures for TSDF and transporter approvals.

7.7.3 Hazardous Waste Manifests and LDR Certification

All hazardous waste transported from the site will be accompanied by a Hazardous Waste Manifest. Navy personnel will be responsible for reviewing and signing all waste documentation, including waste profiles, manifests, and LDR notifications (manifest packages). Prior to signing the manifest, the designated Navy official will ensure that pre-transport requirements of packaging, labeling, marking, and placarding are met according to 22 CCR, Sections 66262.30 through 66262.33, and 49 CFR, Parts 100 through 177.

The Navy will receive one copy of the manifest; the remaining copies will be given to the transporter. The manifest will be returned to the Navy signatory official to be placed on file. Copies of all manifests for waste generated at the site will also be kept in a central project file.

A LDR form will accompany the shipment of hazardous waste to the TSDF. The TSDF must be notified prior to sending the waste. The following items must accompany the notification and are included in one of the following facility specific forms:

- EPA ID number (provided by the Navy)
- Manifest number
- Waste analysis data
- If the waste is also restricted, corresponding concentration-based or technology-based treatment standards or prohibitions

7.7.4 RCRA Records Retention

The designated Navy manifest signatory official will be responsible for ensuring that all hazardous waste recordkeeping requirements are met according to 22 CCR, Sections 66262.20 through 66262.44, including retention of signed copies of manifests from the designated facility that received the waste. The copy must be maintained for a period of at least 3 years from the date the waste was accepted by the initial transporter. Additionally, biennial and exception reporting must be submitted, as necessary, according to 22 CCR, Sections 66262.41 and

66262.42, respectively. Additional reporting may be required according to 22 CCR, Section 66262.43.

8.0 COMMUNITY RELATIONS ACTIVITY

Community relations' activities will be conducted to inform the public about the ongoing activities and to encourage involvement in the review of relevant documents and discussions regarding the proposed removal action.

8.1 PUBLIC INFORMATION

The OEW characterization, and seismic and geotechnical evaluations are being conducted in accordance with the Community Relations Plan, prepared for former NAS Alameda, to facilitate public involvement in the decision-making process. This Focused RI Work Plan for IR Site 1 and other documentation associated with these activities at IR Site 1 will be contained in the administrative record for this site. The Administrative Record for Alameda Point is located at SWDIV Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, California 92132-5187.

8.2 PUBLIC PARTICIPATION

The Navy established a Restoration Advisory Board (RAB) for this base to encourage local participation in the hazardous waste cleanup program at former NAS Alameda. This board is a citizen-based committee representing local community interests. All meetings are advertised locally in an effort to encourage public attendance and participation. RAB meeting agendas, minutes, and presentation materials are included in the administrative record for public review.

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APPENDIX A

PROJECT CONTRACTOR QUALITY CONTROL PLAN

Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, California 92132-5190

CONTRACT NO. N44255-95-D-6030
DO NO. 0095

APPENDIX A

FINAL

PROJECT CONTRACTOR QUALITY CONTROL PLAN

Revision 1
September 28, 2001

ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1 ALAMEDA POINT ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640
San Diego, CA 92101

Abid Loan, P.E.
Project Manager

Mary Schneider
Program QC Manager

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ABBREVIATIONS AND ACRONYMS

BRAC	Base Realignment and Closure
CAD	Computer-assisted drafting
CL	confidence level
CPR	cardiopulmonary resuscitation
CQC	Contractor Quality Control
CQCR	Contractor Quality Control Report
DCN	Design Change Notice
DERA	Defense Environmental Restoration Account
DFW	Definable Features of Work
DO	Delivery Order
ECM	Environmental Compliance Manager
EFANW	Engineering Field Activities Northwest
EOD	explosive ordnance disposal
FCR	Field Change Request
FWENC	Foster Wheeler Environmental Corporation
GIS	Global Information System
IR	Installation Restoration
IRP	Installation Restoration Program
MSDS	Material Safety Data Sheet
NAS	Naval Air Station
Navy	United States Navy
NCR	Nonconformance Report
NTR	Navy Technical Representative
OEW	Ordnance and explosive waste
O&M	Operations and maintenance
OU	Operable Unit
PD	probability of detection
PjM	Project Manager
PQCM	Project Quality Control Manager
QA	quality assurance
QC	quality control
QCM	Quality Control Program Manager
RAC	Remedial Action Contract
RFI	request for information

ABBREVIATIONS AND ACRONYMS
(Continued)

RI	Remedial Investigation
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
SD	Submittal description
SDS	Spatial Data Standard
SEC	Site Emergency Coordinator
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
SOP	Standard Operating Procedure
SUXOS	Senior UXO Supervisor
SWDIV	Southwest Division Naval Facilities Engineering Command
USACE	U. S. Army Corps of Engineers
UXO	Unexploded ordnance
UXO QC	UXO Quality Control

1.0 INTRODUCTION

This Project Contractor Quality Control (CQC) Plan establishes the procedures and methods to be implemented for the ordnance and explosive waste (OEW) investigation, and geotechnical and seismic evaluations at Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of the former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California. The Project CQC Plan combines the Southwest Division Naval Facilities Engineering Command (SWDIV) and Engineering Field Activities Northwest Remedial Action Contract (EFANW RAC II) No. N44255-95-D-6030, and requirements with the Foster Wheeler Environmental Corporation (FWENC) quality control (QC) system requirements.

1.1 PURPOSE

The purpose of this Project CQC Plan is to establish the specific procedures and methods for field inspections and processing activities performed at IR Site 1. The Project CQC Plan provides an effective QC system to ensure the quality of all work performed by FWENC and its subcontractor personnel.

This site-specific Project CQC Plan for Delivery Order (DO) No. 0095 is an addendum to the Final Contractor Quality Control Program Plan (FWENC, 1999).

The objective of the Remediation Work is to perform an OEW investigation, and geotechnical and seismic evaluations of IR Site 1 and adjacent waters of IR Site 1. The field activities will also include installation of temporary facilities and site controls, erosion control, and soil sampling/analysis and classification.

All records shall be specified, prepared, and maintained to provide documentary evidence of quality. Records will be legible, identifiable, retrievable, and protected against damage, deterioration, or loss. Requirements and responsibilities will be established and documented to ensure control of preparation, maintenance, distribution, retention, and disposition.

This Project CQC Plan complies with the requirements of the following documents:

- *Contractor's Guide* (SWDIV, 1996)
- *Guide Specification Section 1450* (Naval Facilities Engineering Command, 1999)
- *Guide Specification Section 1330* (Naval Facilities Engineering Command, 1999)

1.2 SCOPE

This Project CQC Plan is applicable to all field operations and will be available in the project field office. All work activities will be conducted in accordance with the Focused Remedial Investigation (RI) Work Plan. The Project CQC Plan will be implemented for the following activities:

- Installation of temporary facilities (for example, Site Office trailer, fencing, and staging areas)
- Site surveys (pre-screening for hazardous materials)
- Bathymetric survey
- Clutting vegetation down to a height of 4 inches or less
- Surface OEW investigation
- Geotechnical sample collection
- Bathymetric drilling
- Geotechnical laboratory testing
- Seismic field evaluation
- Transportation and disposal of debris
- Restoration of the site

2.0 ORGANIZATION AND RESPONSIBILITIES

This section describes the organization and authority for project personnel performing construction operations, including subcontractors. The organizational structure, functional responsibilities, personnel qualifications, levels of authority, and lines of communication established within the organization to ensure high-quality work are documented. The organization chart can be found in Figure 2-1.

All personnel assigned to this project will be qualified and experienced. The resumes of key unexploded ordnance (UXO) and QC personnel are available upon request. The responsibilities and authorities of the key project personnel are described in the following paragraphs.

2.1 PROJECT MANAGER

The Project Manager (PjM), Mr. Abid Loan, is responsible for the direction, execution, and successful completion of project tasks to achieve overall project goals. The PjM has responsibility for and the authority to perform the following quality affecting activities related to the project:

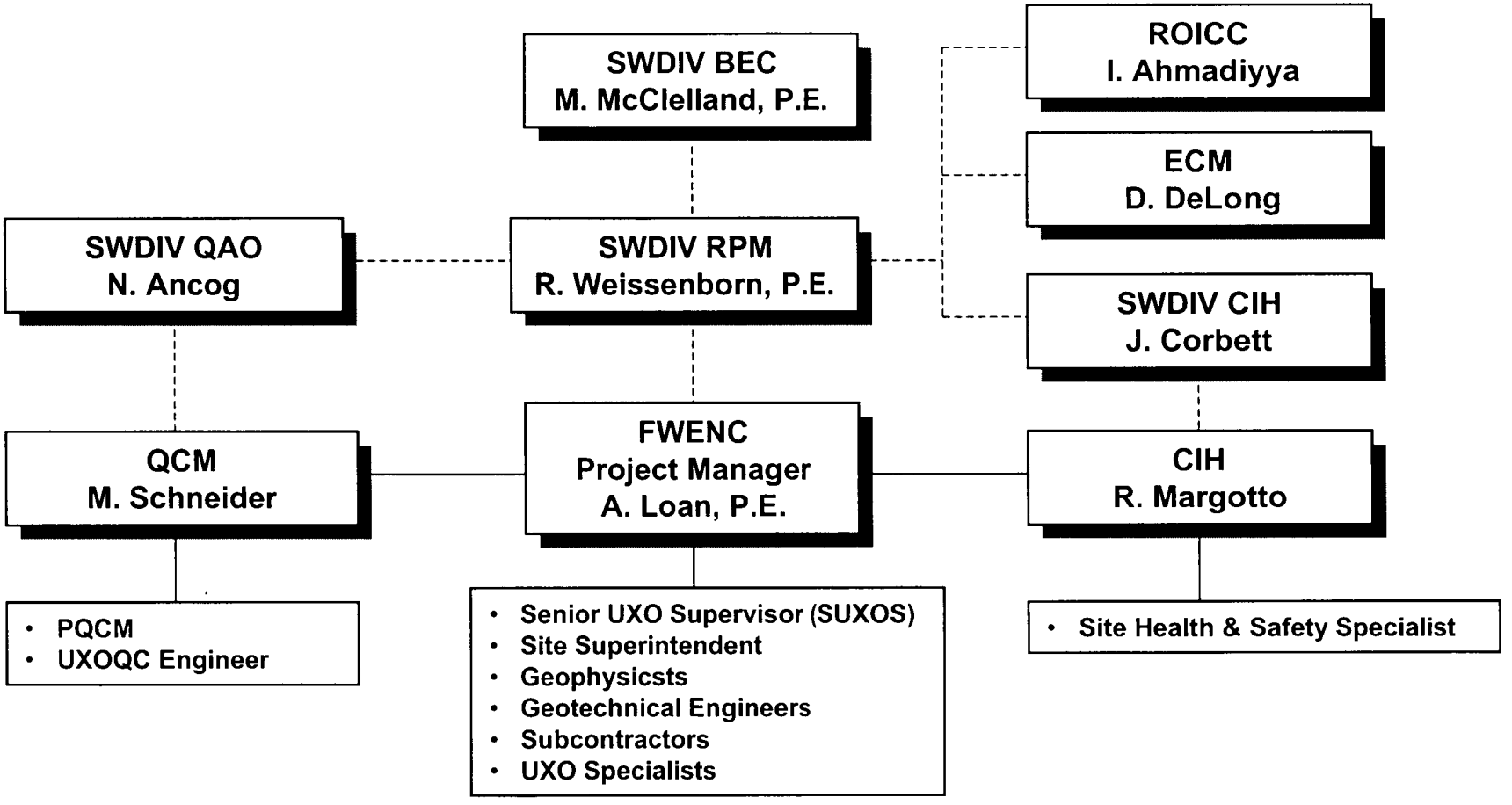
- Coordinate work activities of subcontractors and FWENC personnel, and ensure all personnel adhere to the administrative and technical requirements of the project.
- Monitor and report the progress of work and ensure project deliverables are completed on time and under budget.
- Ensure adherence to the quality requirements of the contract, project scope of work, and the Project CQC Plan.
- Ensure that all work activities are conducted in a safe manner in accordance with the Site-Specific Health and Safety Plan (SHSP), *U.S. Army Corps of Engineers Safety and Health Manual* (COE EM-385-1-1), and all applicable Occupational Safety and Health Administration (OSHA) regulations.
- Serve as the primary contact between Navy personnel and FWENC for actions and information related to the work.
- Ensure that all contract work will meet the requirements of the specifications and applicable codes.
- Coordinate satisfactory resolution and completion of evaluation and acceptance report for Nonconformance Reports (NCRs).

2.2 SITE SUPERINTENDENT

The Site Superintendent (SS) reports to the PjM and is responsible for coordinating, directing, implementing, and supervising site activities. The Senior UXO Supervisor will act as the SS for this project. Specific duties of the SS include:

Figure 2-1

Project Organization Chart



- Implement construction activities in accordance with the Work Plan (WP).
- Direct field leaders, support personnel, and subcontractors.
- Administer site access.
- Maintain work site, vehicles, and equipment.
- Coordinate and maintain logistics of all components of on-site tasks, including all personnel and equipment.
- Prepare daily production reports and estimate future scheduling needs.
- Coordinate, prepare, and complete all required field reports.
- Ensure that all safety requirements are met, enforced, and documented.
- Ensure compliance with applicable regulations, contractual, and health and safety requirements.
- Maintain the current 2-week look-ahead schedule of field activities.
- Recommend changes to improve project efficiency and effectiveness.
- Verify field personnel are trained and qualified to complete assigned tasks.
- Attend QC meetings.
- Coordinate work efforts with the Project Quality Control Manager (PQCM) and Site Health and Safety Specialist (SHSS).
- Provide technical justification for change orders.
- Maintain site security.

2.3 PROJECT QUALITY CONTROL MANAGER

The PQCM is responsible for overall management of project QC and reports to the Program QC Manager. An appointment letter assigning the PQCM for implementation of the QC program is provided in Attachment 1 and will be issued to the Navy Technical Representative (NTR)/Resident Officer in Charge of Construction (ROICC) as well as the Navy Remedial Project Manager (RPM) prior to beginning fieldwork. The PQCM's resume is presented in Attachment 2. The PQCM will be on-site at all times during construction. The PQCM has the authority to stop work on site-related issues affecting the quality of work performed and directing the correction of all nonconforming work. In the event of his absence, a qualified individual will be appointed to serve as her replacement. The requirements for the alternate will be the same as for the designated PQCM.

The duties of the PQCM as they apply to this project include:

- Provide and maintain an effective QC system for all construction activities.
- Monitor QC activities to ensure conformance with authorized policies, procedures, contract specifications, and sound practices.
- Maintain sufficient staff to perform all QC activities to ensure QC for all work phases.

- Prepare the Contractor Quality Control Report (CQCR).
- Perform and coordinate the three phases of inspection (preparatory, initial, and follow-up) and ensure they are implemented for all definable phases of construction.
- Ensure all required tests and inspections are performed and results reported.
- Conduct required QC meetings, including the coordination and mutual understanding, site survey visit, and other scheduled meetings.
- Stop work that is not in compliance with the contract.
- Be responsible for issuance and enforcement of NCR.
- Ensure that all on-site and off-site inspections, testing, and sampling are performed in accordance with the plans, specifications, and applicable codes.
- Provide inspection and conduct or supervise testing and sampling.
- Coordinate and maintain submittal register, photograph log sheet, request for information (RFI), and NCR log.
- Review and maintain records of approved submittals, design change notices (DCNs) for construction activities, and Field Change Requests (FCRs).
- Inspect material delivery handling and storage in accordance with technical specifications.
- Issue compliance notice on material, equipment, work in place, and workmanship.
- Review project plans and procedures for quality issues.
- Identify the need for corrective action and initiating, recommending, and coordinating solutions for project quality problems.
- Perform submittal reviews and approvals/certifications.

2.4 UXO QC REPRESENTATIVE

The UXO QC Representative will be responsible for QC activity related to all OEW and OEW-related work. The duties of UXO Representative include:

- Implement UXO Surface Clearance Team certification procedures prescribed in the CQC Plan as directed by the PQCM.
- Conduct Surface Clearance Effective Tests defined in the CQC Plan as directed by the PQCM.
- Conduct surveillance activity of encountered OEW (if any).
- Conduct other inspection/audit activity as directed by the PQCM.
- Complete reports and other documentation as directed by the PQCM.

2.5 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will also be the Site Superintendent for this project. He will be responsible for implementing, directing, and supervising inspection and certification activities for all UXO and UXO-related activities. The duties of the SUXOS include:

- Ensure all fieldwork activities are performed in accordance with the FWENC Corporate engineering procedures, technical specifications, RI Work Plan, and applicable professional standards.
- Give ordnance safety briefings.
- Provide oversight of fieldwork activities performed by subcontractors.
- Implement specifications requirements.
- Conduct daily field inspections and tests required by the project technical specifications and applicable professional standards.
- Prepare and sign field certifications and documents in accordance with the technical specifications and RI Work Plan.
- Issue and maintain FCRs and DCNs.
- Has overall responsibility and accountability for all UXO handling activities conducted by FWENC personnel and their subcontractors.
- Act as the Site Emergency Coordinator (SEC).

2.6 SITE HEALTH AND SAFETY SPECIALIST

The SHSS ensures that all elements of the approved SHSP are implemented and enforced on-site. The SHSS reports directly to the Program Health and Safety Officer, Roger Margotto, and will assist in implementing and enforcing the SHSP in the field. The SHSS has full authority to issue stop work orders or evacuation orders where work operations or noncompliance(s) may threaten the health and safety of site workers or the public.

Duties and responsibilities for the SHSS include the following:

- Ensure enforcement of the SHSP through daily site inspections.
- Coordinate site health and safety requirements with the Project Superintendent and DO Manager.
- Ensure maintenance of all health and safety monitoring and personal protective equipment, and direct site monitoring activities.
- Report all health and safety monitoring results to the Program Health and Safety Officer.
- Coordinate daily field activities with the Site Superintendent.
- Coordinate site safety and emergency response duties; verify site communications system with site personnel.
- Implement periodic safety equipment and supplies.

- Perform inspection of safety equipment.
- Coordinate with the Program Health and Safety Officer and ROICC.
- Maintain recordkeeping and reporting systems.
- Initiate necessary revisions or changes to the SHSP.
- Maintain site control procedures.
- Maintain current certification for first aid and cardiopulmonary resuscitation (CPR).

2.7 SUBCONTRACTORS AND VENDORS

The subcontractors for this project will be limited to a land surveyor, an equipment operator, a drilling company, waste transporter, and a marine service (barge) company. The subcontractors are required to provide labor, material, and equipment necessary to conduct their respective services as directed by the Superintendent. All subcontractors and vendors will be required to conform to the FWENC's CQC Plan and the requirements specified in all approved procedures, technical specifications, and contract provisions.

The subcontractor's QC inspectors are responsible for field inspection of their processing and operating activities. FWENC will monitor, oversee, and make on-site observations and inspections of work in progress to determine if the subcontractor's work is proceeding in accordance with the CQC Plan.

Subcontractor personnel are responsible for maintaining a daily log of the project activities they perform and for providing information needed to complete the CQCR. All inspection records, including inspection reports, deficiency reports, and reinspections of corrective actions, will be documented by the PQCM.

3.0 SUBMITTALS

This section describes the review and approval process of submittals. In addition, PQCM will institute and maintain a submittal register (Attachment 3) to track submittals from issue to approval. A list of required submittals will be developed at the initiation of the project activities and revised as necessary. The submittal register will be kept current by FWENC at the job site. Copies of the submittal register will be provided to the government at the end of the project.

Submittals will be scheduled, reviewed, certified, and managed in accordance with the Naval Facilities Engineering Command Guide Specification NFGS-01330F.

Required submittals are all Administrative as follows:

- **Administrative Submittals.** Data presented for reviews and approval to ensure that administrative requirements of projects are adequately met, but not to ensure directly that work is in accordance with design concept and in compliance with contract documents.

3.1 SUBMITTAL DESCRIPTIONS

Applicable submittal descriptions (SD) are as follows:

- **SD-01 Pre-construction Submittals**
  - Certificates of insurance
  - Surety bonds
  - List of proposed subcontractors
  - List of proposed products
  - Construction progress schedule
  - Submittal schedule
  - Schedule of values
  - Health and safety plan
  - Work plan
  - Quality control plan
  - Environmental protection plan
- **SD-02 Shop Drawings**
  - Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

- Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the contractor for integrating the product or system into the project.
- Drawings prepared by or for the contractor to show how multiple systems and interdisciplinary work will be coordinated.

- **SD-05 Design Data**
  - Calculations, mix designs, analyses, or other data pertaining to a part of work.

- **SD-06 Test Reports**
  - Report signed by authorized official of testing laboratory that a material, product, or system identical to the material, product, or system to be provided, has been tested in accordance with specified requirements (testing must have been within 3 years of date of contract award for the project).
  - Report which includes findings of a test required to be performed by the contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
  - Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
  - Investigation reports.
  - Daily checklists.
  - Final acceptance test and operational test procedure.

- **SD-07 Certificates**
  - Statements signed by responsible officials of manufacturer of product, system, or material attesting that product, system, or material meets specification requirements. Must be dated after award of project contract and clearly name the project.
  - Document required of Contractor, or of a supplier, installer, or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods, or personnel qualifications.
  - Confined space entry permits.

- **SD-08 Manufacturer's Instructions**
  - Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data Sheets (MSDSs) concerning impedances, hazards, and safety precautions.

- **SD-09 Manufacturer's Field Reports**
  - Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

- **SD-10 Operation and Maintenance Data**
  - Data intended to be incorporated in operations and maintenance manuals.

- **SD-11 Closeout Submittals**
  - Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.
  - As-built drawings.
  - Special warranties.
  - Posted operating instructions.
  - Training plan.

3.2 SUBMITTAL REQUIREMENTS

The following requirements apply to submittals:

- Units of weights and measures will match those used in the construction drawings.
- Each submittal will be complete and in sufficient detail to allow determination of compliance with plans, specifications, and applicable codes.
- Each submittal will be reviewed by the PQCM or an approved reviewer.
- A transmittal form certifying compliance with all contract requirements will accompany each submittal.
- Proposed deviation from the contract requirements will be clearly identified.
- Submittals will include items such as applicable drawings, descriptive literature, test reports, samples, operations and maintenance (O&M) manuals, certifications, and warranties.
- All spatial data, including computer-assisted drafting (CAD) drawings, will conform to the Tri-Service Spatial Data Standard (SDS) and be submitted as AutoCAD version 14 – or Microstation version 5.0, or a later, compatible format.
- Global Information System (GIS) data will conform to the Tri-Service SDS, and be submitted as ARCInfo Export Format or MGE Export format.
- The State Plane Coordinate System, North American Datum 83 and Lambert Zones 1 through 6 will be used.
- The vertical reference elevation is mean sea level, with the relevant control data provided.
- Catalog Cut/Shop Drawing Transmittal and Approval (Attachment 3).

3.3 REVIEW OF SUBMITTALS

Submittals will be reviewed to ensure completeness, accuracy, and contract compliance. All items will be approved by the PQCM. Any submittals requiring modifications or changes will be returned to the originating organization for correction and then resubmitted for review and approval by the PQCM prior to acceptance. Approval of the submittal will be indicated by stamping, signing, or initialing, in addition to dating the submittal form. The PQCM or designee will perform a check to ensure that all materials and equipment have been tested, submitted, and approved during the preparatory phase of the QC inspections; no construction activities will be performed prior to the required approval of applicable submittals.

3.4 SUBMITTAL PROCESS

The PQCM will provide all submittals to the ROICC/NTR and forward them to the required Navy personnel as an "information only" submittal. Each submittal will have a unique document control number. All possible attempts will be made to schedule submittals to allow for approval time noted in the contract and project scope of work. However, certain submittals will require accelerated processing to maintain the construction schedule.

The PQCM will update the submittal register regularly. A transmittal form will accompany each submittal. Each transmittal and submittal register, except sample panel and sample installation, will be identified with the following information permanently adhered to or noted on each separate component.

- Contract number and DO number.
- Project title and location.
- Name, address, and phone number of subcontractor, supplier, manufacturer, and any other second tier contractor associated with submittal.
- Date of submittal.
- Description of item being submitted, including reference to specification section and SD number.
- Approval of submitting organization indicating conformance to the requirements.
- SD number of each component of submittal.
- Product identification and location in project.
- Submittals to be reviewed by the PQCM or an approved reviewer. The submittal will indicate that it either conforms to contract requirements or does not conform to contract requirements.

Format of each submittal type is described in the following sections.

3.4.1 Format of Administrative Submittals

Administrative submittals will be formatted as follows:

- When the submittal includes a document which is to be used in a project or become part of project record, other than as a submittal, do not apply contractor's approval stamp to document, but to a separate sheet accompanying document.
- Operation and Maintenance Manual Data: Submit in accordance with Section 01781.

3.5 REVIEW AND PROCESSING OF SUBMITTALS THAT DO NOT REQUIRE NAVY APPROVAL

Submittals will be reviewed by the PQCM or an approved reviewer. The submittal will indicate that it either conforms to established requirements or does not conform to established requirements. The PQCM will advise submitter of the results of the review. The submittal log will be updated to indicate status.

Conforming submittals will be certified by the PQCM for approval and forwarded to the required Navy personnel as an "information only" submittal.

Non-conforming submittals are returned to the submitter for correction, resolution of comments, and resubmittal.

3.6 REVIEW AND PROCESSING OF SUBMITTALS THAT REQUIRE NAVY APPROVAL

Submittals will be reviewed by the PQCM or approved reviewer. The submittal will indicate that it conforms to established requirements, or does not conform to contract requirements. Reviewed and certified submittals will be forwarded to the contracting officer utilizing the transmittal and approval form (Attachment 3). Each form will indicate item transmitted, date and signature of PQCM and submittal reviewer (when applicable), and QC-certifying statement. The QC-certifying statement is as follows:

> "I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with Contract Number N44255-95-D-6030, is in compliance with the contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval."

Upon completion of review, the ROICC (or ROICC's Representative) may return the transmittal sheet to the PQCM for further action.

The PQCM will advise submitter of the results of the review in writing and include any comments. The submittal log will be updated to indicate status.

Nonconforming submittals may be returned to the submitter for correction, resolution of comments, and resubmittal if required. No work will begin until submittals for that work have been returned as "Approved" or "Approved as Noted".

3.7 REVISED SUBMITTALS

Revised submittals will be logged, reviewed, and processed in a manner identical with the initial submittal. When resubmitting disapproved transmittals or transmittals noted for resubmittal, a copy of previously submitted transmittal including all reviewer comments for use by approving authority will be provided.

The submittal register used for the original submittal will be used for each resubmittal followed by a sequential alpha suffix to indicate resubmission.

4.0 TESTING

The PQCM shall ensure the performance of all tests specified or required by the project specifications and drawings to verify that control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project are included in the Focused RI Work Plan and the Standard Operating Procedures (SOPs). The type, number, and frequency of required tests are specified in the Testing Plan and Log (Attachment 3). The SUXOS is responsible for conducting the required tests. These tests include both operational and acceptance testing as appropriate. For all testing activities, the PQCM shall:

- Verify that testing procedures comply with contract requirements.
- Verify that facilities and testing equipment are available and comply with testing standards.
- Check test instrument calibration data against certified standards.
- Verify that recording forms and the test identification control number system have been prepared.

4.1 DOCUMENTATION

All test results, both passing and failing, will be recorded on the CQCR for the day the results are obtained. Specific paragraph reference, location where tests were taken, and the sequential control number identifying the test will be recorded. The actual test reports may be submitted later to the Navy RPM and ROICC. An information copy of tests performed by off-site facilities will be provided directly to the PjM or designee.

4.2 LABORATORY SERVICES

An independent testing laboratory will provide laboratory services as needed. The laboratory will be selected and qualified in accordance with applicable project requirements and accredited/certified as described below. Name of the laboratory and proof of accreditation will be submitted after procurement has been completed and prior to the field activities.

4.2.1 Accreditation for Non-Environmental Projects

Acceptable accreditation programs for non-environmental projects are the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program, the American Association of State Highway and Transportation Officials Program, and the American Association for Laboratory Accreditation Program.

A copy of the certificate of accreditation, scope of accreditation, and latest directory of the accrediting organization for accredited laboratories will be submitted to the Contracting Officer or designated representative. The scope of the laboratory's accreditation shall include the test methods required by the project. Any deviation from the above requirements must be approved in writing by the ROICC.

4.2.2 Accreditation for Environmental Projects

Laboratories performing Installation Restoration Program (IRP) work funded by the Defense Environmental Restoration Account (DERA) or Base Realignment and Closure (BRAC) must successfully complete the Navy Laboratory Evaluation Program. Unless otherwise specified, sampling and analysis shall be performed using current U.S. Environmental Protection Agency (EPA) procedures and QC. Any deviation from the above requirements must be approved in writing by the SWDIV QA Officer.

On-site chemical analysis by mobile laboratories must be performed by laboratories certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program.

5.0 FIELD INSPECTION PLAN

Project CQC Plan is the means by which FWENC ensures that all field activities, including activities of subcontractors and suppliers, comply with the requirements of the contract. The Definable Features of Work (DFW) is defined as an activity or task which is separate and distinct from other activities, and which requires separate control activities. In general, each work discipline or specification division would be considered a DFW. In addition, sub-activities or tasks within a work discipline or specification division could be considered a DFW if determined that separate and distinct control requirements exist for these activities or tasks.

The definable features of work establish the measures required to verify both the quality of work performed and compliance with specified requirements, and includes inspecting materials and workmanship before, during, and after each definable feature of work. The definable features for this project are:

- Initial screening (hazardous)
- Temporary facilities
- Site preparation
- OEW investigation
- Bathymetric survey
- Geotechnical drilling
- Bathymetric drilling
- Seismic evaluation
- Shipping
- Site restoration
- Demobilization

Detailed descriptions of each definable feature of work are presented in Table 1-1. The controls defined shall be adequate to cover all construction operations and are keyed to the proposed construction sequence. Project CQC includes implementing the following three control phases for all aspects of the work specified:

- Preparatory phase
- Initial phase
- Follow-up phase

5.1 COORDINATION AND MUTUAL UNDERSTANDING MEETING

Prior to start of site work, a Coordination and Mutual Understanding meeting with the ROICC will be held to discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used, administration of on-site and off-site work, and coordination of the Contractor's management, production, and the PQCM duties with the ROICC. At a minimum, the Contractor's personnel required to attend will include the DO Manager, Project Superintendent, and PQCM. Minutes of the meeting will be prepared by the PQCM and signed by both the Contractor and the Contracting Officer. This meeting may be held in conjunction with other meetings (that is, pre-construction meeting).

5.2 QC MEETINGS

After the start of field activities, the PQCM will conduct QC meetings once every week or as required by the ROICC. The meetings will be held at the project site and will be attended by the Project Superintendent. The PQCM will notify the ROICC at least 48 hours in advance of each meeting. One copy of the QC meeting minutes will be sent to all attendees within 2 calendar days of the meeting. The following will be accomplished at each meeting:

- Review the minutes of the previous meeting
- Review the schedule and the status of work
  - Work, inspection, or testing accomplished since last meeting
  - Rework items identified since last meeting
  - Rework items completed since last meeting
- Review the status of submittals
  - Submittals reviewed and approved since last meeting
  - Submittals required in the near future
- Review the work to be accomplished in the next 2 weeks and documentation required. Schedule the three phases of control and testing.
  - Establish completion date for rework items
  - Preparatory phases required
  - Initial phases required
  - Follow-up phases required
  - Testing required
  - Status of off-site work or testing
  - Documentation required
  - Discuss upcoming Activity Hazard Analyses
- Resolve QC and production problems

- Address items that may require revisions to the CQC Plans
  - Changes in QC Organization personnel
  - Changes in procedures

5.3 PREPARATORY PHASE INSPECTION

The PQCM will conduct preparatory phase inspections prior to starting the definable features of work listed in the RI Work Plan and the SOPs. These inspections shall include:

- Review of each paragraph of applicable SOPs.
- Review of the RI Work Plan and drawings.
- Ensure that all materials and/or equipment have been tested, submitted, and approved.
- Ensure that provisions have been made to provide required control inspection and testing.
- Examine the work area to ensure that all required preliminary work has been completed and is in compliance with the approved RI Work Plan requirements.
- Physically examine the required materials and equipment to ensure that they are properly delivered to the site, conform to approved shop drawings or specifications, and are properly stored.
- Review the appropriate activity hazard analysis to ensure safety requirements are met.
- Discuss procedures for constructing the work, including potential repetitive deficiencies.
- Documentconstruction tolerance and workmanship standards for the particular phase of work.
- Ensure that the Project CQC Plan for the work to be performed has been accepted by the Navy.

The PjM, Navy RPM, and ROICC shall be notified at least 2 working days in advance of preparatory phase activity. This phase shall include a meeting conducted by the PQCM and attended by other responsible construction personnel, such as the Construction Superintendent.

The issues discussed during the preparatory phase meetings will be documented on the Inspection Checklist and will be reported on the CQCR with the Preparatory Inspection Checklist included in Attachment 3. The PQCM will direct personnel performing work activities as to the acceptable level of workmanship required.

5.4 INITIAL PHASE INSPECTION

An initial inspection will be performed at the beginning of a definable feature of work and will include:

- A check of preliminary work to ensure that it is in compliance with contract requirements.

- A review of the Inspection Checklist documenting results of the preparatory meeting.
- Verification of full contract compliance, including required control inspection and testing.
- Establishment of the required level of workmanship, and verification to ensure work meets minimum acceptable standards.
- Resolution of all differences.
- A check of safety requirements to include compliance with and upgrading of the SHSP and activity hazard analysis.
- A review of the activity hazard analysis with project personnel.

The PjM, the Navy RPM, and ROICC will be notified at least 2 working days in advance of any initial phase activity. The PQCM will document initial inspections for each item using the Initial Inspection Checklist and attach it to the CQCR. The exact location of the initial phase inspection will be indicated for future reference and comparison with follow-up inspections.

An initial phase inspection will be conducted each time a new crew arrives on-site or any time acceptable, specified quality standards are not being met.

5.5 FOLLOW-UP PHASE INSPECTION

During the completion of a particular work feature, follow-up inspections will be conducted to ensure continued compliance with contract requirements. The frequency of the follow-up inspections will depend on the extent of the work being performed on each particular feature. Each follow-up inspection will be documented on the Follow-Up Inspection Checklist, which will be attached to the CQCR. A final follow-up check will be conducted on any completed work phase prior to the commencement of a subsequent phase. Any deficiencies will be corrected prior to starting additional phases of work or will be identified on a list of items that do not conform to the specified requirements or are incomplete.

5.6 ADDITIONAL PREPARATORY AND INITIAL PHASES

The PQCM may conduct additional preparatory and initial inspections on the same definable features of work under the following circumstances:

1) If the quality of ongoing work is unacceptable as determined by the PjM, or designee, or the Navy RPM, and ROICC
2) If there are changes in the staff, on-site supervision, or work crew
3) If work on a definable feature is resumed after a substantial period of inactivity
4) If other problems develop

5.7 COMPLETION INSPECTION

Completion inspections will be performed as summarized in this section.

5.7.1 Field Quality Control Completion Inspections

The PQCM, or designated FWENC QC inspection personnel, will conduct a detailed inspection prior to the pre-final inspection, when all of the work or an increment of work is deemed to be substantially complete. The PjM, the Navy RPM, and ROICC, and ECM may also participate and will be notified in advance of the inspection date. The work will be inspected for conformance to plans, specifications, quality, workmanship, and completeness. The PQCM will prepare an itemized list of work not properly completed, inferior workmanship, or work that does not conform to plans and specifications. The list will also include outstanding administrative items, such as record (as-built) drawings, O&M manuals, and spare parts. The list will be included in the QC documentation and submitted to the PjM, or designee, the Navy RPM, ROICC, and ECM within 5 working days following the inspection and will specify an estimated date for correction of each deficiency. The completion inspection will be documented on the Completion Inspection Checklist, shown in Attachment 5 and attached to the CQCR.

5.7.1.1 Surface Clearance Effectiveness Test

After team certification in surface clearance operations, surface clearance effectiveness tests will be conducted periodically for each surface clearance team to determine the continued effectiveness of surface clearance operations. Initially, surface clearance effectiveness tests should be performed twice per month for each surface clearance team. The frequency of these tests may be increased or decreased based upon the performance of the individual teams. This determination will be made by the PjM, or SUXOS with concurrence of the Site UXO QC Representative. Unless otherwise specified in the contract, our objective for surface clearance is 85% PD with 90% CL of removal.

Prior to surface clearance operations beginning in a grid that has been selected as a surface clearance effectiveness test grid, QC personnel will seed the grid with a predetermined number of target items. These items will be marked to identify them as QC test items. After the team completes surface clearance operations in the grid, they will separate all QC test items from other items recovered during the surface clearance. QC will be notified that the grid has been completed. QC personnel will determine if the number of QC test items recovered is sufficient to meet the 85% PD with 90% CL criteria. If the team fails achieves the 85% PD with 90% CL, the team will be decertified from conducting surface clearance operations. The cause will be identified and corrective action initiated. After corrective action, the decertified team will be processed through the surface clearance test grid to demonstrate the ability to achieve an 85% PD with 90% CL prior to conducting surface clearance operations.

5.7.1.2 Standard Penetration Testing Quality Control

Prior to fieldwork commencement, the drilling company shall provide supplier specifications for any and all equipment used in drilling. This shall include, but not be limited to, the hammer, samplers, drilling rig, and augers. The Site QC representative shall use the specifications to certify that the equipment is the proper weight and dimension.

During drilling activity, the overseeing geologist/engineer shall confirm the hammer height is 30 inches from the auger head prior to performing the Standard Penetration Testing (SPT). The geologist shall perform a measure check at least twice a day. SPT procedures will be performed in accordance to ASTM Test Method D 1586.

Two Cone Penetrometer Tests (CPTs) shall be advanced near two borings to compare CPT test results (soil stratification and penetration resistance) to boring log information. CPT soundings will be performed in accordance with ASTM Test Method D 3441.

5.7.1.3 Bathymetric Survey Field Quality Control Test

The openwater bathymetric survey will be performed to U.S. Army Corps of Engineers (USACE) Class 1 hydrographic survey standards. A copy of this standard will be available on site during the work activities.

Specific quality control test for vertical and horizontal control relating to the bathymetric survey are discussed as follows:

- **Vertical Control** - Calibration and daily quality control checks of the fathometer will require daily bar checks. Bar checks are performed as an initial calibration and for daily quality control. Bar checks are conducted in the morning each day prior to the start of work and at the end of each day's surveying. The bar check will be performed as follows:

    - An initial speed of sound in water is selected (approximately 4,800 ft/sec).
    - The bar is lowered to a known depth (for this survey the depth will be 5 feet).
    - The draft of the transducer is then set so the fathometer displays the correct depth of 5 feet.
    - Once the draft is set, the bar is lowered to project depth (typically 20 feet for this project) and the speed of sound adjusted so the instrument displayed the correct depth.
    - Once the instrument draft and speed of sound are set, the bar is drawn back towards the water surface in 5-foot increments and the readings checked. if at the 5-foot bar depth the instrument reading is correct, the bar check is completed and the instrument calibrated. If not, the process is repeated with the new initial speed of sound setting at the 5-foot depth.
    - All bar checks are recorded on the paper strip chart as part of the analog printout of the daily survey activities.

- **Horizontal Control** - A DGPS receiver will be used to provide horizontal positioning for the bathymetric surveying. The unit will be capable of receiving either U.S. Coast Guard broadcast or satellite differential corrections. Prior to the start of field activities two tide gauges will be located by survey and the DGPS unit will be checked against these locations. Data collected from these locations and the horizontal accuracy will be inspected to ensure the data would meet the requirements of the survey. In addition to this initial calibration, daily quality control checks are typically performed on one or more of these control points.

5.7.2 Pre-Final Inspection

The PQCM will conduct the pre-final inspection. The Navy RPM, ROICC, ECM, PQCM, FWENC QC personnel, or other project representatives, as applicable, will attend. The PjM, or designee, will schedule the pre-final inspection in response to notification from the PQCM prior to the planned inspection date. The PQCM ensures that all specific items previously identified on the Rework Items List, along with all remaining project work, will be complete and acceptable by the scheduled date for the pre-final inspection. At this inspection, the PjM, or designee, will develop a list of incomplete and/or unacceptable work performed under the contract and will provide this list to PjM.

5.7.3 Final Acceptance Inspection

The PjM will schedule the final acceptance inspection based on notification from the PQCM of readiness. The inspection will include the QC inspection personnel, PQCM, or other primary management personnel, the PjM, the Navy RPM, or ROICC. Notification will be given to the ROICC at least 14 days prior to the planned final acceptance inspection date and must include verification that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

Completion Certification: Upon completion of work under a DO, the Project QC Manager will furnish a certificate to the ROICC attesting that the work has been completed, inspected, and tested, and is in compliance with the contract.

5.8 INSPECTION DOCUMENTATION

The PQCM is responsible for the maintenance of the inspection records. Inspection records will be legible and clearly provide all necessary information to verify that the items or activities inspected conform to the specified requirements or, in the case of nonconforming conditions, provide evidence that the conditions were brought into conformance or otherwise accepted by the ROICC. All inspection records will be made available to the Navy.

6.0 DOCUMENTATION

Preparation, review, approval, and issuance of documents affecting quality will be controlled to the extent necessary to determine that the documents meet specified requirements.

6.1 CONTRACTOR QUALITY CONTROL REPORT

The PQCM is responsible for maintenance of current records of QC operation, activities, and tests performed, including the work of subcontractors and suppliers. The records will include factual evidence that required QC activities and tests were performed. A CQCR will be completed to document construction activities covered by the Project CQC Plan and will include:

- Record inspection and /or testing performed
- Identification and location of each DFW and its current phase (preparatory, initial, and follow-up) of completion
- Results of inspections/testing
- Location and description of deficiencies
- Deficiencies corrected as of the date of the report
- Rework items
- Deviations from plans, difficulties, and resolution
- Test and/or control activities performed with results and references to specifications/ plan requirements, including the control phase (preparatory, initial, follow-up) and deficiencies (along with corrective action)
- Material received with statement as to its acceptability and storage
- Submittals reviewed, with contract reference, by whom, and action taken
- Off-site surveillance activities, including actions taken
- Contractor's verification statement
- Site visitors/purpose, deviations from plans, difficulties, and resolution

The records will indicate a description of both conforming and nonconforming features which will be covered with a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The CQCR attached to the Contractor Production Report will be furnished to the Navy ROICC on the first workday following the date covered by the report, except that reports need not be submitted for days during which no work is performed. At a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no-work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work will summarize work for that day only. Reports will be signed and dated by the PQCM and other appropriate personnel, including

subcontractors responsible for completion of activities. The report will include copies of test reports and copies of reports prepared by all subordinate QC personnel. The report will be provided to the ROICC for review by 10:00 a.m. on the working day following the day the work was performed or as agreed by the Navy ROICC.

6.2 CONTRACTOR PRODUCTION REPORT

The Contractor Production Report will be prepared for each day the work is performed and will be attached to the daily CQCR prepared for the same day. The Contractor Production Report will be prepared, signed, and dated by the Project Superintendent and will contain the following information:

- Contractor and subcontractor and their area of responsibility
- Location and description of work performed
- Trades working on the project that day and number of personnel
- Operating equipment, with hours worked, idle, or down for repair
- Work performed that day giving location, description, weather conditions, and by whom work was done
- Any delays encountered
- Site visitors/purpose
- Job safety evaluations stating checked items, results, and instructions, or corrective actions
- A list of instructions given/received and conflicts in plans and/or specifications
- Contractor's verification statement

6.3 CONFERENCE NOTES AND CONFIRMATION NOTES

In addition to other required documentation, the PQCM is responsible for taking notes and preparing the reports of all conferences. Conference notes will be typed and the original report furnished to the Navy within 5 days after the date of the conference for concurrence and subsequent distribution to all attendees. At a minimum, this report will include:

- Date and place the conference was held
- List of attendees, including name, organization, and telephone number
- Written comments presented by attendees attached to each report with the conference action noted: "A" for an approved comment, "D" for a disapproved comment, "W" for a comment that has been withdrawn, and "E" for a comment that has an exception noted
- Comments made during the conference and decisions affecting criteria changes
- Conference notes that augment the written comments

The PjM or his designee is also responsible for providing a record of all discussions, verbal directions, telephone conversations, and so forth, that FWENC personnel or their representatives participate in on matters relating to this contract and work. These records, entitled "Confirmation Notices," will be numbered sequentially and will fully identify participating personnel, subject discussed, and any conclusions reached. The PjM or his designee will forward a reproducible copy of the confirmation notices to the Navy RPM or designee and ROICC within 5 workdays.

6.4 TESTING PLAN AND LOG

As tests are performed, the PQCM will record on the Testing Plan and Log (Attachment 3) the date the test was conducted, the date the test results were forwarded to the ROICC, and remarks and acknowledgement that an accredited testing laboratory was used. The updated Testing Plan and Log will be attached to the last daily CQCR of each month.

6.5 CERTIFICATION OF SURFACE CLEARANCE TEAMS

Each team conducting surface clearance operations will be certified in the Surface QC Test Grid. In order to gain certification in surface clearance operations, each surface clearance team must demonstrate the ability to achieve an 85% PD with a 90% CL of removal of target items. The cumulative binomial probability will be applied in determining 85% PD at a 90% CL.

A test grid will be established and seeded with 34 target items that are representative of the target items being searched for. A mixture of inert UXO items and frag should be used to seed the test grid. In order to achieve 85% PD at a 90% CL, 32 of the 34 target items must be located by the team in the test grid. If less than 32 items are located, the team must continue training until they can achieve the 85% PD at a 90% CL.

When new team members that have not previously been certified in surface clearance operations are added to a team, the entire team must process through the surface clearance test grid and demonstrate the ability to achieve an 85% PD at a 90% CL before conducting field operations.

Establishing the test grid and processing teams through the test grid is a function of quality control and must remain separate and independent from operations.

6.6 REWORK ITEMS LIST

The PQCM will maintain a list of work that does not comply with the contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. A rework item that is corrected the same day it is discovered will not be reported. The Rework Items List will be attached to the last daily CQCR of each month.

7.0 NONCONFORMANCES

The PQCM documents any work or materials not conforming to the technical specifications or project/contract requirements on an NCR. The NCR will detail the nonconforming condition, the recommended corrective action(s), and the disposition of the corrective action(s). Qualified representatives from Engineering, quality assurance (QA), and Construction will review the NCR and either accept or reject the recommended corrective action or disposition. The NCR will remain open until the nonconforming condition has been satisfactorily resolved and verified by PQCM. Upon receipt of notification of detected nonconformance, NCRs for each item will be completed.

7.1 IDENTIFICATION OF NONCONFORMING ITEMS

Items identified as nonconforming will be documented on an NCR that will include the following information:

- Description of nonconforming item or activity indicating root causes of nonconformance to help prevent future occurrences
- Detailed description of nonconformance
- Referenced criteria
- Recommended disposition and corrective action to prevent recurrence (as applicable)
- Affected organization
- Anticipated completion date

Deficient conditions have been divided into three categories:

- In-process deficiencies
- Installed deficiencies
- Conditions that require Stop Work

7.1.1 In-Process Deficiencies

In-process deficiencies are those conditions discovered during the course of QC inspections that are intended to be corrected or brought into conformance with requirements. The PQCM will notify the SS of the problem or deficiency. Items not solved or corrected will be noted as in-process deficiencies and will be noted briefly on the daily CQCR and detailed on a NCR and added to the Rework Items List. Items on the punch list that cannot be corrected will be considered as installed deficiencies.

7.1.2 Installed Deficiencies

Installed deficiencies are those conditions discovered during the course of QC inspection of completed work that do not meet established acceptance criteria or requirements, and are not intended to or cannot be brought into conformance. These conditions will be noted on a Rework Items List in addition to a NCR for evaluation and disposition. The PQCM will issue the NCR summarizing discrepancies within 24 hours of discovery.

In the event an NCR is not resolved within 7 calendar days after issuance, a notice of non-response will be issued to the PjM. Each report will be consecutively numbered, logged, and updated by the PQCM. Resolution of installed deficient conditions will be approved by the PQCM. Copies of completed reports will be sent to the ROICC.

7.1.3 Condition Requiring Stop Work

If corrective actions are insufficient, resolution cannot be reached, or a notice of non-response issued, or results of prior work are indeterminate, work may be stopped by PQCM. An immediate Stop Work Order can be issued by anyone for health and safety issues. The PQCM, DO Manager, or ROICC can issue a Stop Work Order in writing to the Project Superintendent who will direct site activities to stop.

The conditions of the Stop Work Order will be noted in the CQCR and described in detail on a NCR in addition to the Rework Items List to allow evaluation of the problem(s) and proper corrective action(s). Work will not continue until the Stop Work Order has been resolved by the PjM and documented.

7.1.4 NCR Log

The PQCM will maintain an NCR log (Attachment 3) which provides the NCR number, a brief description of the nonconforming condition, date of issue, point of contact to resolve, date of anticipated corrective action and date closed.

7.2 NONCONFORMING ITEMS

The nonconforming items will be controlled to prevent inadvertent use of material or workmanship quality. All items noted as nonconforming will be clearly identified and segregated from acceptable items when practical.

7.3 DISPOSITION

The disposition of NCRs will include the necessary actions required to bring the nonconforming condition to an acceptable condition and may include reworking, replacing, retesting, or reinspecting. Implementation of the disposition may be done in accordance with the original procedural requirements, a specific instruction, or a FCR.

7.3.1 Field Change Requests and Design Change Notices

The Field Engineer initiates FCRs to document a change to the approved plans, specifications, and drawings that occur in the field.

Changes will be qualified as follows:

- **Major Change**—one that affects the intent of the original design, including equipment, component, system, or structure that relates to function, operation, or safety of the designed product and/or personnel safety.
- **Minor Change**—one that does not affect the intent of the original design or product, including equipment, component, system, or structure that relates to function, operation, or safety.

Where the FCR is marked "Minor Change," the Field Engineer may execute the change and, in parallel, obtain concurrence from the PjM that the change was indeed "minor."

Where the FCR is marked "Major Change," disposition must be sought before execution. An appropriately executed DCN will be issued for approval by the PjM and ROICC. A DCN will not be issued for a "minor change" FCR. An example of a DCN is provided in Attachment 3.

7.4 CORRECTIVE ACTIONS

Upon detection of a nonconforming condition, the PQCM will immediately take corrective action. In addition to resolving identified nonconforming conditions, corrective action records will also address the initial cause of adverse conditions and establish methods and controls to prevent recurrence of the same or similar types of nonconformance. The PQCM will monitor the corrective actions to verify that they were properly implemented and accepted and that the NCR was closed out.

8.0 QUALITY MANAGEMENT

In addition to the required QC field inspections, the FWENC Quality Program requires a Quality Management overview of the site QA/QC Program implementation. The PQCM will perform regular internal quality control checks on the site implementation of the QA/QC Program. Reports of any deficiencies will be reported to the PjM for corrective action.

Inspection will be performed and checked for the following:

- Possession and use of approved procedures, standards, and project specifications.
- Conformance with appropriate procedures, standards, and instructions.
- Thoroughness of performance.
- Identification and completeness of documentation generated during performance.
- Recommended changes to continually improve project efficiency and effectiveness.
- Personnel ensured that they have been provided with instructions necessary to perform quality-related activities. A Training Program will be structured to emphasize correct performance of work and provide for the following:
  - Achievement of initial proficiency.
  - Maintenance of proficiency.
  - Adaptation to changes in technology, methods, or job responsibilities.

9.0 REFERENCES

Foster Wheeler Environmental Corporation (FWENC). 1999. *Field Contractor Quality Control Program Plan.* April 26.

Naval Facilities Engineering Command. 1999. *Guide Specification, NFGS-01450H.* September.

Naval Facilities Engineering Command. 1999. *Guide Specification, NFGS-01330F.* September.

Southwest Division Naval Facilities Engineering Command (SWDIV). 1996. *Contractor's Guide.* February.

TABLES

TABLE 1-1

DEFINABLE FEATURES OF WORK

CONTRACT NUMBER: N44255-95-D-6030 **PROJECT TITLE AND LOCATION:** IR Site 1 Characterization, Alameda Point **CONTRACTOR:** FWENC

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Initial Screening (hazardous)	Operation shall be carried out in accordance with approved RI Work Plan, Health and Safety Plan, and procedures including SOPs.		• Notification to NAS Alameda Environmental Compliance Manager (ECM). • Segregation and staging.		Ongoing inspections of staging area.	
Temporary Facilities	Equipment and Material meets specification requirements.		• Proper installation.		Area restored.	
Site Preparation	Operation to be carried out in accordance with approved procedures.		• Preparation of work zones (vegetation removed, exclusion zone established and marked). • Temporary fencing and barricade installation. • Corners surveyed, grid network established. • Proper equipment mobilization on as needed basis.		Ongoing inspection of material and equipment. Area restored.	
OEW Characterization and Removal	Operation to be carried out in accordance with approved work plan and procedures including SOPs. Certification of Surface Clearance Team(s).		• Above Ground Sweep. • Surface Clearance Effectiveness Tests. • Marking (when OEW is located). • Disposition options (OEW status determination). • Notification to ECM. • Final disposition.		Ongoing inspection and proper staging and disposal.	
Geotechnical Drilling Bathymetric Survey Bathymetric Drilling	Operation to be carried out in accordance with approved procedures.		• Soil Classification. • Bay floor sweep. • Soil Classification.		Ongoing inspection.	
Seismic Evaluation	Operation to be carried out in accordance with approved procedures.		• Establish boreholes/test pit locations for offshore and upland areas. • Obtain samples. • Sample evaluation. • Data processing. • Bathymetric survey.		Ongoing inspection.	

TABLE 1-1

DEFINABLE FEATURES OF WORK

CONTRACT NUMBER: N44255-95-D-6030 **PROJECT TITLE AND LOCATION:** IR Site 1 Characterization, Alameda Point **CONTRACTOR:** FWENC

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Site Restoration	Operation to be carried out in accordance with approved procedures.		• The backfilled area will be graded to a condition consistent with the surrounding areas. • Site cleanup shall include repair of any erosion or run-off related damage. • Restoration activities will be coordinated with the ROICC. • Remaining wastes generated during construction activities will be transported off site and disposed in accordance with the Focused RI Work Plan.		Ongoing inspection of site restoration activities.	
Shipping	Operation to be carried out in accordance with approved procedures.		• Proper packaging and labeling (when required). • Checking seals and certifications.		Ongoing inspection of project control activities.	
Demobilization	Operation to be carried out in accordance with approved procedures.		• Demobilization consists of decontamination of all equipment, cleaning the project site, inspection and certification of completion. • All demobilization activities shall be conducted in accordance with approved Focused RI Work Plan.		Ongoing inspection of demobilization activities and joint Navy/FWENC final inspection shall be conducted.	

Notes:

ECM – Environmental Compliance Manager
FWENC – Foster Wheeler Environmental Corporation
NAS - Naval Air Station
ROICC - Resident Officer in Charge of Construction
OEW - Ordnance and explosive waste
SOP - Standard Operating Procedure

ATTACHMENT 1

DELEGATION OF AUTHORITY LETTER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

June 1, 2001

Mr. Melvin N. Young
Foster Wheeler Environmental Corporation
1230 Columbia Street, Suite 640
San Diego, CA 92101

Subject: **Project Quality Control Manager**

Reference: Contract No. N44255-95-D-6030,
Naval Facilities Engineering Command, EFA Northwest
Environmental Remediation Contract, Delivery Order (DO) No. 0095,
Former Naval Air Station Alameda, California

Dear Mr. Young,

In accordance with the terms of Foster Wheeler Environmental Corporation's (Foster Wheeler Environmental) Contract No. N44255-95-D-6030, this letter notifies you of your appointment as the Project Quality Control Manager for DO No. 0095 at the Formal Naval Air Station Alameda, California.

As the designated Project Quality Control Manager, you will be responsible to manage the site-specific quality control requirements in accordance with project contractor quality control plan. You will be responsible for conducting quality control meetings, perform the three phases of control, and perform submittal review. You will be required to be present during all quality control testing to ensure that any testing is conducted in accordance with required specification. In addition, you will be required to prepare the necessary quality control certification and documentation.

You have the authority and responsibility for suspending work when conditions adverse to quality are identified and for directing the correction of all non-conforming work.

This letter is effective immediately until modified by the Program Quality Control Manager with concurrence of the Foster Wheeler Environmental DO Manager, the SWDIV Remedial Project Manager, and the Resident Officer in Charge of Construction.

Sincerely,

Foster Wheeler Environmental Corporation

Mary Schneider
Program Quality Control Manager

cc: Abid Loan, Project Manager

1230 COLUMBIA STREET, SUITE 640, SAN DIEGO, CA 92101
TEL: 619-234-8696 FAX: 619-234-8591

ATTACHMENT 2

RESUME

MELVIN N. YOUNG

Senior UXO Supervisor

EXPERIENCE SUMMARY

Mr. Young is a Senior UXO Supervisor who supervises field activities and teams doing geo-physical and GPS data collection, UXO surface clearance, brush cutting and removal operations, and demolition operations. He works with Geo-science and GIS personnel to produce accurate maps that depict transect points and grid layouts which field teams use while performing their daily activities.

EDUCATION

Completed Basic EOD School, December 1980

TRAINING

HAZWOPER, California Blasters License

FOSTER WHEELER ENVIRONMENTAL CORPORATION EXPERIENCE

UXO Supervisor, March 2001 – Current
Foster Wheeler Environmental, Fort McClellan, AL
Supervises field activities and teams doing geo-physical and GPS data collection, UXO surface clearance, brush cutting and removal operations, and demolition operations. He works with Geo-science and GIS personnel to produce accurate maps that depict transect points and grid layouts which field teams will use while performing their daily activities.

UXO Supervisor, May 2000 – October 2000
Foster Wheeler Environmental, Adak, AK
UXO lead for a four-man geophysical survey team. All team members were responsible for operating and maintaining EM61 and Leica GPS systems. Geophysical data was collected by walking transect lines all over the island.

PREVIOUS EXPERIENCE

UXO Supervisor/Senior UXO Supervisor, July 1998 - May 2000
USA Environmental, Inc., Ft. Ord, CA
Land reclamation project for the Corps of Engineers. Supervised and conducted surface and sub-surface clearance operations for unexploded ordnance. Supervised as SUXO and as Team Leader the following operations: ordnance disposal (demo ops), backhoe, mechanical brush cutting and UXO sweep teams. Ordnance encountered: artillery projectiles, mortars, grenades, flares, small arms, sub-munitions, and land mines.

UXO Supervisor, November 1995 – July 1998
CMS Environmental, Inc., Ft. Ord, CA
Land reclamation project for the Corps of Engineers. Conducted surface and subsurface clearance operations for unexploded ordnance. Supervised operations of the demolition, backhoe, mechanical brush cutting and UXO sweep teams. Ordnance encountered: artillery projectiles, mortars, grenades, flares, small arms, sub-munitions, and land mines.

UXO Specialist, August 1995 – October 1995
CMS Environmental, Inc., Leach Lake
Worked on the demolition team disposing of all unexploded ordnance found. Disposed of 10,500 ordnance items in twelve working days.

UXO Supervisor/EOD Advisor, February 1993 – September 1994
Kuwait Ministry of Defense, Kuwait
Supervised and liaison between six international ordnance and Military groups. Responsible for the collection, storage, and disposal of all ordnance remaining after the Gulf War. Ordnance encounter: bombs, sub-munitions, rockets, missiles, artillery, and small arms.

UXO Supervisor, September 1991 – November 1992
Environmental Chemical Corporation (ECC)
Clearance operations at U.S. Army base at Doha, Kuwait. Land reclamation projects in the deserts of Kuwait, and acted as an EOD advisor for the Kuwait Ministry of Defense, supervised 4 people in the locating, handling and packaging of depleted uranium rounds including cleanup operations of unexploded ordnance. Ordnance encountered: artillery sub-munitions, rockets, grenades, and small arms.

EOD/UXO Advisor, August 1988 – September 1991
Law Enforcement
Responded to calls that required the identification/disposal of military ordnance and any other types of explosive devices. Trained and advised law enforcement personnel on proper bomb disposal and bomb threat procedures. Licensed California blaster for disposal of Ordnance.

EOD Supervisor, October 1986 – January 1988
Instructor of EOD Training
Det #1 assigned to Indian Head, MD. Taught improvised nuclear devices to EOD Supervisors, covert operatives, and FBI. Worked with other government personnel in research and developing new techniques and equipment for field applications. Evaluated joint exercises to establish training goals for units and personnel.

EOD Supervisor, October 1983 – October 1986
49th EOD, Ft. Ord, CA
Coordinated and participated in range clearance operations at Ft. Ord, Camp Roberts, and Ft. Hunter Ligget. Performed EOD procedures of armored vehicles and self-propelled artillery. Supervised 10 EOD personnel. Ordnance encountered: bombs, rockets, artillery, land mines, small arms, grenades and loose explosives.

EOD Supervisor, April 1982 – October 1983
54th EODCC, Presidio of San Francisco, San Francisco, CA
Assisted in the writing, organizing, and conducting ARTEP evaluations of 13 detachments that fall under the responsibility of the control group. Monitoring unit training at Redstone Arsenal acted as an inspector during unit's administration inspections. Assisted in the coordination personnel required for Secret Service missions.

EOD School and EOD Specialist, March 1980 – April 1982
143rd EOD Detachment, SEAD, Romulus, NY
Provided EOD support to local law enforcement agencies, Secret Service, and FBI. Conducted range clearance operations at Ft. Drum, NY. Ordnance encountered: Artillery, rockets, grenades, small arms.

RELATED COMPANY INFORMATION

Office Location: Fort McClellan, AL
FWENC Hire Date: 3/9/00
Years with Other Firms:
Daytime Telephone: 256-820-7904
E-mail Address: myoung@fwenc.com

ATTACHMENT 3

QUALITY CONTROL FORMS

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

REPORT NO

PHASE | CONTRACT NO N44255-95-D-6030, DO No. 0095 | CONTRACT TITLE

PREPARATORY

WAS PREPARATORY PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

INITIAL

WAS INITIAL PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

Schedule Activity No.	Description

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

Schedule Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.

Schedule Activity No.	Description

AUTHORIZED QC MANAGER AT SITE DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

Schedule Activity No.	Description

GOVERNMENT QUALITY ASSURANCE MANAGER DATE

Submittal Status Register
DO 0095

Due	Document	Version	Forecast	Actual	DCN	Comment
3/30/01	Draft Base-Wide Health and Safety Plan	Draft	3/30/01	4/2/01	01-0096	
3/30/01	Draft Site-Specific Health and Safety Plan, Ordnance Explosive, Geotechnical, and Seismic Characterization	Draft	3/30/01	4/2/01	01-0097	
3/30/01	**Pre-Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site1**	Pre Draft	4/13/01	4/13/01	01-0098	Submittal date extended to 4/13/01 per RPM concurrence
3/30/01	**Pre-Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 2**	Pre Draft	4/13/01	4/13/01	01-0119	Submittal date extended to 4/13/01 per RPM concurrence
5.2/01	**Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, June 1, 2001**	Draft		6/1/01	01-0223	

Submittal Status Register
DO 0095

Due	Document	Version	Forecast	Actual	DCN	Comment
6/1/01	Response to Comments, Preliminary Draft Focused Remedial Action Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, June 1, 2001	Final		6/1/01	01-0226	
8/17/01	Draft-Final Focused Remedial Investigation Work Plan, Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, August 17, 2001	Draft-Final	8/17/01		01-0299	
8/17/01	Response to Comments, Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, August 17, 2001	Final	8/17/01		01-0313	
8/24/01	Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Waste Characterization, Removal Action and Geotechnical and Seismic Evaluations at Installation Restoration Site 2, August 24, 2001	Draft	8/24/01		01-0316	

Submittal Status Register
DO 0095

Due	Document	Version	Forecast	Actual	DCN	Comment
8/24/01	Response to Comments, Pre-Draft Focused Remedial Investigation Work Plan, Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 24, August 29, 2001	Final	8/24/01			
5/11/01	Base-Wide Health and Safety Plan	Final				
5/11/01	Site-Specific Health and Safety Plan	Final				
6/15/01	RI Work Plan Site 1	Draft-Final				
6/15/01	RI Work Plan Site 2	Draft-Final				
6/29/01	RI Work Plan Site 1	Final				
6/29/01	RI Work Plan Site 2	Final				
10/03/01	Report of Findings IR Site 2	Pre-Draft				
10/09/01	FS Attachment IR Site 2	Pre-Draft				
10/11/01	FS Attachment IR Site 1	Pre-Draft				
10/22/01	Report of Findings IR Site 1	Pre-Draft				

Submittal Status Register
DO 0095

Due	Document	Version	Forecast	Actual	DCN	Comment
10/23/01	Report of Findings IR Site 2	Draft				
10/31/01	AM IR Site 1 or 2	Final				
11/12/01	FS Attachment IR Site 1	Draft				
11/20/01	Report of Findings IR Site 1	Draft				
12/11/01	FS Attachment IR Site 2	Draft				
12/19/01	Removal Action Work Plan IR Site 1 or 2	Draft				
2/7/02	Report of Findings IR Site 2	Final				
2/12/02	FS Attachment IR Site 1	Draft-Final				
2/21/02	Report of Findings IR Site 1	Draft-Final				
3/14/02	FS Attachment IR Site 1	Final				
3/11/02	FS Attachment IR Site 2	Draft-Final				
3/25/02	Report of Findings IR Site 1	Final				
4/10.02	FS Attachment IR Site 2	Final				
5/30/02	Removal Action Closeout Report IR Site 1 or 2	Pre-Draft				

Submittal Status Register
DO 0095

Due	Document	Version	Forecast	Actual	DCN	Comment
7/12/02	Removal Action Closeout Report IR Site 1 or 2	Draft				
9/9/02	Removal Action Closeout Report IR Site 1 or 2	Draft-Final				
10/23/02	Removal Action Closeout Report IR Site 1 or 2	Final				

TESTING PLAN AND LOG

CONTRACT NUMBER	PROJECT TITLE AND LOCATION	CONTRACTOR
N44255-95-D-6030, DO No. 0095	Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA	Foster Wheeler Environmental Corporation

SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		FREQUENCY	DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE				
		Atterberg Limits - ASTM D-4318-95a										
		Compaction Characteristics Using Modified Effort (Modified Proctor) – ASTM D-1557-91										
		Moisture/Density – ASTM D-2937-00										
		Organic Content – ASTM D-2974-00										
		Particle Size with Hydrometer – ASTM D-422-63										
		Saturated Hydraulic Conductivity – ASTM D-5084-90										
		Unconsolidated, Undrained Triaxial Shear – ASTM D-2850-95										
		Water Contents – ASTM D-2216-92										

CATALOG CUT/SHOP DRAWING TRANSMITTAL AND APPROVAL
SOUTHWESTNAVFACENGCOM 4355 / 2 (10-89)

See instructions on reverse
No carbon paper is required to complete this form
No transmittal letter required

SUBMITTAL NO.

CQC CLAUSE ☐ IS APPLICABLE ☐ IS NOT APPLICABLE

REFERENCES TO USE WHEN CQC CLAUSE IS APPLICABLE	PART I – FOR CONTRACTOR USE	REFERENCES TO USE WHEN CQC CLAUSE IS NOT APPLICABLE
(A) ROICC/REICC	FROM (*Contractor*): Foster Wheeler Environmental Corporation, 1230 Columbia Street, Suite 640, San Diego, CA 92101 — TO (A)	(A) DESIGNER
	CONTRACT NO. — CONTRACT TITLE	
(B) *(Check one)* ☐ RECORD ☐ APPROVAL	THE FOLLOWING ITEM IS SUBMITTED FOR (B) PER SPECIFICATION SECTION NUMBER	(B) APPROVAL
	CERTIFICATION (This form shall not be used to forward proposed substitutions): IT IS HEREBY CERTIFIED THAT THE ☐ EQUIPMENT ☐ MATERIAL SHOWN AND MARKED IN THIS SUBMITTAL IS THAT PROPOSED TO BE INCORPORATED INTO CONTRACT N68711-98-D-5713, CTO 0011 IS IN COMPLIANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS AND CAN BE INSTALLED IN THE ALLOCATED SPACES.	
(C) AUTHORIZED CONTRACTOR QUALITY CONTROL REPRESENTATIVE	CERTIFIED BY (C) — DATE	(C) PERSON DESIGNATED BY CONTRACTOR AS HAVING AUTHORITY TO SIGN CERTIFICATION
	PART II – FOR DESIGNER USE	
	FROM (*Designer*) — TO (ROICC/REICC)	
(D) CURSORY REVIEW REQUIRED ON RECORD COMES – REPLY TO ROICC ONLY IF APPROPRIATE. DETAILED REVIEW REQUIRED ON SUBMITTALS FOR GOVERNMENT APPROVAL. STAMP AND MARK EACH COPY AS APPROPRIATE.	THIS SUBMITTAL HAS BEEN REVIEWED (D). THE FOLLOWING RECOMMENDATION IS MADE:	(D) DETAILED REVIEW REQUIRED. STAMP AND MARK EACH COPY AS APPROPRIATE
	SIGNATURE — DATE	
	PART III – FOR ROICC/REICC USE	
(E) DESIGNER *(Copy to ROICC)*	FROM (*ROICC/REICC*) — TO (E)	(E) CONTRACTOR *(Copy to ROICC)*
	ENCLOSURES ARE RETURNED WITH THE FOLLOWING COMMENTS:	
	SIGNATURE — DATE	

INSTRUCTIONS

Enter submittal number.
Check applicable CQC clause.

CONSTRUCTION CONTRACTOR – PART I

From: *Construction contractor's name and address.*
To: *Designer's name and address or ROICC/REICC as applicable.*

Enter contract number.

Enter title of contract and location.

Describe item being transmitted. A separate form must be used for each set of catalog cuts or shop drawings. Include name of manufacturer, catalog sheets, drawing no., name of item, and number of copies forwarded.

Check submittal for record or approval purposes.

Type date and name.

Sign original and one.

Distribution (as applicable to CQC clause):

Send to designer: *original and four transmittal forms with the seven copies of catalog cuts or shop drawings. When factory inspection is required, send eight copies.*

Send to ROICC/REICC: *one carbon copy of form.*

Send to ROICC/REICC (CQC): *Original and three copies of catalog cuts or shop design.*

Retain one copy for your files.

DESIGNER (A&E CONTRACTOR, SOUTHWESTNAVFACENGCOM) OR OICC RESPONSIBLE FOR DESIGN – PART II

From: *Designer's name and address.*
To: *ROICC/REICC and address.*

Enter recommended action (i.e., approval recommended or disapproved, with appropriate comments).

Type date and name.

Sign original and one.

Distribution:

Send to ROICC/REICC: *original and three copies with six (or seven when factor inspection is required) copies of catalog cuts or shop drawings.*

Retain one copy of form and one copy of cuts or drawings for your files.

ROICC OR REICC – PART III

From: *ROICC or REICC and address.*
To: *Construction contractor's name and address.*

Enter action taken (i.e., approved subject to, etc.).

Type date and name.

Sign original and one.

Distribution:

Send to construction contractor: *original with three copies of cuts or drawings*

Send to OICC one carbon copy of form with one copy of cut or drawings.

Retain two copies of form and two copies of cuts or drawings: *one for field use and one for ROICC/REICC file.*

NOTE: When factory inspection is required, forward one approved copy of cuts or drawings to the OICC, Construction Division. Cover transmittal should state the information is forwarded for factory inspection.

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

CONTRACT NO	TITLE AND LOCATION	REPORT NO
N44255-95-D-6030	DO No. 0095, Alameda Point, Alameda, CA	

CONTRACTOR	SUPERINTENDENT
FOSTER WHEELER ENVIRONMENTAL CORPORATION	

AM WEATHER	PM WEATHER	MAX TEMP (F)	MIN TEMP (F)

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? (If YES attach copy of the meeting minutes)	☐ YES	☐ NO
WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO

TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
TOTAL WORK HOURS FROM START OF CONSTRUCTION	

LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED ☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Owner	Description of Construction Equipment Used Today (incl Make and Model)	Arrival	Off Rent Date	Actual Demob Date	Hours Idle	Hours Used	Reason for Idle

REMARKS

CONTRACTOR/SUPERINTENDENT _____ DATE _____

PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

CONTRACT NO	DEFINABLE FEATURE OF WORK	SPEC SECTION	DATE
		SCHEDULE ACT NO.	INDEX #

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING?

CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)

COMMENTS:

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN?

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS.

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.

CLARIFY ANY DIFFERENCES.

PRELIMINARY WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NOT, WHAT ACTION IS TAKEN?

TESTING

IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.

WHEN REQUIRED?

WHERE REQUIRED?

REVIEW TESTING PLAN.

HAS TEST FACILITIES BEEN APPROVED?

SAFETY

ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐

REVIEW APPLICABLE PORTION OF EM 385-1-1.

MEETING COMMENTS

NAVY/ROICC COMMENTS DURING MEETING.

OTHER ITEMS OR REMARKS

OTHER ITEMS OR REMARKS:

QC MANAGER DATE

INITIAL PHASE CHECKLIST

SPEC SECTION	DATE

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO	INDEX #
N44255-95-D-6030, DO No 0095			

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

PROCEDURE COMPLIANCE

IDENTIFIY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS.

COMMENTS:

PRELIMINARY WORK

ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN?

WORKMANSHIP

ESTABLISH LEVEL OF WORKMANSHIP.

WHERE IS WORK LOCATED?

IS SAMPLE PANEL REQUIRED? YES ☐ NO ☐

WILL THE INIITAL WORK BE CONSIDERED AS A SAMPLE? YES ☐ NO ☐

(IF YES, MAINTAIN IN PRESENT CONDITION AS LONG AS POSSIBLE AND DESCRIBE LOCATION OF SAMPLE)

RESOLUTION

RESOLVE ANY DIFFERENCES.

COMMENTS:

CHECK SAFETY

REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS

COMMENTS:

OTHER

OTHER ITEMS OR REMARKS

QC MANAGER DATE

FOLLOW-UP PHASE CHECKLIST

Date	
Report No.	

Contract No.: N44255-95-D-6030, DO No. 0095	Contract Title: Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA

Project Name/Number

Item/Activity Inspected

Drawing Reference	Rev.	Drawing Reference	Rev.

Inspection Attribute	Specification Reference	Acceptance Criteria	Inspection Result	Accept/Reject

Requests For Information Issued/Subject	Reference No.

FCRs Issued/Subject	Reference No.

Nonconformances Issued/Subject	Reference No.

Reinspection Required	Yes	No	

Comments

QC MANAGER DATE

MATERIALS INSPECTION CHECKLIST

Date

Report No.

Contract No.: N44255-95-D-6030, DO No. 0095

Contract Title: Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA

Contract Specifications:

Material	Qty	Condition	Testing	Comments

Storage Conditions:

Submittals:

MATERIALS INSPECTION CHECKLIST

	Date
	Report No.

Contract No.: N44255-95-D-6030, DO No. 0095	Contract Title: Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA

Contract Specifications:

Material/Equipment Certifications:

Preparatory Site Conditions:

Contract Variance:

Comments:

Attendees:

QC Representative	Date
QCSM	Date

COMPLETION INSPECTION CHECKLIST

Date

Report No.

Contract No.: N44255-95-D-6030, DO No. 0095

Contract Title: Ordnance and Explosives Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA

Contract Specifications:

Major Definable Features of Work:

A. Open Punchlist Items From Follow-Up Phase Checklist:

	Item	Date of Completion
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

B. New Punchlist Items Noted:

	Item	Date of Completion
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

C. ROICC NOTIFIED? ☐ Yes ☐ No

On behalf of Foster Wheeler Environmental Corporation, I certify this activity is completely in accordance with the Contract Documents, based upon the information available to me.

Project Quality Control Manager

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-
To	Location	Date

RE: Drawing No. _____ Title _____

Specification Section _____ Title _____

Other _____

Description (items involved, submit sketch, if applicable):

Reason for Change

Recommended Disposition (submit sketch, if applicable):

☐ Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☐ Yes ☐ No

Estimate of contract cost or time charge (if any) _____

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date

Disposition

☐ Not approved (give reason).

☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.

☐ Considered major change – Design Change Notice Form to be completed.

FWENC Project Engineer (signature) (if engineering related) ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (signature) (if health and safety related) ☐ Comments (attached) ☐ No Comments	Date	Project Scientist(signature) (if science related ☐ Comments (attached) ☐ No Comments	Date
Distribution:	Date	QC Program Manager (signature) (if science related ☐ Comments (attached) ☐ No Comments	Date
PJM: Abid Loan _____			
SUXOS: Lance Humphrey _____			
QCM: Mary Schneider _____			
Site Superintendent: TBD _____			
Navy RPM: Rick Weissenborn _____			
ROICC: Shirley Ng _____			
Subcontractor: _____ _____			

DESIGN CHANGE NOTICE FORM

Contract No.	DO No.	Design Change Notice Form No.
N44255-95-D-6030	0095	DCNF-
To	Location	Date

RE: Drawing No. _____ Title _____

Specification Section _____ Title _____

Other _____

Description of Change

☐ Engineering "HOLD" placed on all activities in area defined herein pending receipt of formally revised document(s) and/or DCNF.

☐ Released for construction on basis of modifications prescribed by this DCNF.

Reason for Change

☐ Field Change Request (FCRF-_____)

☐ Required Modifications to Drawings or Specifications

☐ Other _____

Exhibits Attached

☐ Copies of marked-up area of drawing(s)

☐ Field Change Request (FCRF-_____)

☐ Other (describe) _____

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date

Comments

FWENC Project Engineer (signature) (if engineering related) ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (Signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (Signature) (if health and safety related) ☐ Comments (attached) ☐ No Comments	Date	Project Scientist (Signature) (if science related) ☐ Comments (attached) ☐ No Comments	Date

Distribution:

		Date
PJM:	Abid Loan	
SUXOS:	Lance Humphrey	
QCM:	Mary Schneider	
Site Superintendent:	TBD	
Navy RPM:	Rick Weissenborn	
ROICC:	Shirley Ng	
Subcontractor:	_____	

QC Program Manager (signature) (if science related) ☐ Comments (attached) ☐ No Comments — Date

NONCONFORMANCE REPORT

Contract No.	DO No.	Nonconformance Report No.
N44255-95-D-6030	0095	
To	Location	Date

RE: Drawing No. _____ Title _____

Specification Section _____ Title _____

Other _____

Supplier or Contractor _____

Description of Component, Part or System _____

Description of Nonconformance (items involved, specifications, code or standard to which items do not comply, submit sketch, if applicable):

Name and signature of person reporting nonconformance	Title/Company	Date

Recommended Disposition (submit sketch, if applicable):

Name and signature of person reporting nonconformance	Title/Company	Date

Evaluation of Disposition by Foster Wheeler Environmental Corporation. Reason of disposition:

Corrective Action ☐ Required ☐ Not Required

Engineering (signature) Date	Quality Assurance (signature) Date
☐ Accepted ☐ Rejected ☐ Accepted w/comments	☐ Accepted ☐ Rejected ☐ Accepted w/comments
Construction (signature) Date	Other (signature) Date
☐ Accepted ☐ Rejected ☐ Accepted w/comments	☐ Accepted ☐ Rejected ☐ Accepted w/comments

Distribution:

		Date
PJM:	Abid Loan	
SUXOS:	Lance Humphrey	
QCM:	Mary Schneider	
Site Superintendent:	TBD	
Navy RPM:	Rick Weissenborn	
ROICC:	Shirley Ng	
Subcontractor:	_____	

Verification of Disposition ☐ Required ☐ Not Required

By :

Signature _____

Title _____

Date _____

NONCONFORMANCE LOG

Contract No.	DO No.	Project Title and Location	Contractor
N44255-95-D-6030	0095	Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA	Foster Wheeler Environmental Corporation

NCR No.	Hold Tag No.	Description of Conditions/Item Affected	Location	Validation	Disposition/ Approval	Re-inspection	Closure	Hold Tag Removal	Remarks

REWORK ITEMS LIST

Contract No.	DO No.	Project Title and Location	Contractor
N44255-95-D-6030	0095	Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA	Foster Wheeler Environmental Corporation

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

PHOTOGRAPH LOG SHEET

Date Submitted

Roll No.

Contract No.: N44255-95-D-6030, DO No. 0095

Contract Title: Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA

Photographer:

Frame	Date	Time	Location/Grid No.	Description/Work No.	Notes
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ATTACHMENT 3 – QUALITY CONTROL FORMS

REQUEST FOR ENGINEERING INFORMATION FORM

FINAL
FOCUSED REMEDIAL INVESTIGATION
WORK PLAN
REVISION 1

THE ABOVE IDENTIFIED FORM IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY NAVFAC SOUTHWEST TO LOCATE THIS FORM. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

REQUEST FOR INFORMATION (RFI)

Contract No.	DO No.	RFI No.
N44255-95-D-6030	0095	
Project Title and Location Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1, Alameda Point, Alameda, CA	Issue Date	Closure Date

Work Area _____

Subcontractor _____

Applicable Plans, Drawings, Specifications _____

Information Requested _____

Project Quality Control Manager Signature _____ Date _____

ROICC Requested _____

ROICC Signature _____ Date _____

Distribution:

		Date
PJM:	Abid Loan	
SUXOS:	Lance Humphrey	
QCM:	Mary Schneider	
Site Superintendent:	TBD	
Navy RPM:	Rick Weissenborn	
ROICC:	Shirley Ng	
Subcontractor:	_____	

APPENDIX B

STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURE

ORDNANCE AND EXPOSIVES/UNEXPLODED ORDNANCE DISPOSAL DISPOSITION

(SOP-1)

Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

CONTRACT NO. N44255-95-D-6030
DO NO. 0095

DRAFT FINAL

STANDARD OPERATING PROCEDURE
ORDNANCE AND EXPLOSIVES WASTE/ UNEXPLODED ORDNANCE DISPOSAL DISPOSITION
(SOP-1)
Revision 0
August 20, 2001

ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1 ALAMEDA POINT ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

1230 Columbia Street, Suite 640
San Diego, CA 92101

Lance Humphrey
Senior UXO Supervisor

Dave Keller
UXO Operations Manager

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ABBREVIATIONS AND ACRONYMS

AFB	Air Force Base
AO	Abandoned Ordnance
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
DoD	Department of Defense
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
ECM	Environmental Compliance Manager
EMER	explosives or munitions emergency response
EO	Expended ordnance
EOD	explosive ordnance disposal
EODB	Explosive ordnance disposal basic
EOR	Explosive Ordnance Reconnaissance
EPA	U.S. Environmental Protection Agency
FWENC	Foster Wheeler Environmental Corporation
GIS	Global Information System
HERO	Hazardous of Electromagnetic Radiation to Ordnance
IR	Installation Restoration
NAS	Naval Air Station
NAVSEA	Naval Sea Systems Command
OD	Open detonation
OEW	ordnance and explosives waste
OU	Operable Unit
PjM	Project Manager
PPE	Personal protective equipment
QC	quality control
QCR	Quality Control Representative
RI	Remedial Investigation
RPM	Remedial Project Manager
RPT	Report
RWQCB	Regional Water Quality Control Board

ABBREVIATIONS AND ACRONYMS
(Continued)

SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
SOP	Standard Operating Procedure
SUXOS	Senior UXO Supervisor
USAF	United States Air Force
UXO	unexploded ordnance

DEFINITIONS

Exclusion Zone—Areas where contamination (hazards) is known or likely to be present, or areas that, because of activity, have the potential to cause harm to personnel. Once ordnance and explosives waste (OEW) are detected, the exclusion zone will be expanded to 1,250 feet for non-fragmenting explosive materials, 2,500 feet for fragmenting explosive materials, or 4,000 feet for bombs and projectiles with 5-inch and greater caliber. The exclusion zone shall be large enough to protect other personnel from the blast and fragmentation hazards of accidental detonation. The minimum exclusion zone for unexploded ordnance (UXO) operations will be 300 feet.

Expended Ordnance (EO)—Ordnance that has functioned as designed, leaving the shell or container behind. This shell or container may or may not contain explosive/pyrotechnic/toxic residue. This material would not be considered inert and could not be salvaged as scrap without appropriate visual inspection, sampling, and/or treatment.

Explosive Ordnance Disposal (EOD) Personnel—Active-duty military personnel who have completed the training course at the U.S. Naval Explosive Ordnance Disposal (EOD) School, Indian Head, Maryland, and are currently assigned to a military EOD unit.

Foster Wheeler Environmental Command Center—A designated location staffed by personnel to relay and control all communications/activities of field personnel and other units.

Inert Ordnance—Ordnance that never contained explosives, or ordnance that has had all explosive components removed and has been certified as safe.

Intrusive Investigation—Excavating for suspected UXO items or for plotted anomalies. Excavation will be by hand or will be done using heavy equipment as deemed appropriate.

Non-Intrusive Investigation—Locating/investigating UXO on the surface of the ground where excavation is not required.

Non-Ordnance and Explosive Metal Debris—Metal debris recovered during operations which is not ordnance related, such as metal rebar, angle iron, sheet metal and bar stock, and so forth.

Open Detonation (OD)—A method of disposal for explosive ordnance where a donor explosive charge is detonated in contact with the ordnance to achieve a high-order detonation of the energetic materials contained within the ordnance.

Ordnance and Explosives Waste (OEW)—Bombs, guided and ballistic missiles, artillery, mortars, rocket ammunition, small arms ammunition, antipersonnel and antitank mines, demolition charges, pyrotechnics, grenades, sea mines, torpedoes, depth charges, containerized and non-containerized high explosives and propellants, depleted uranium rounds, military chemical agents, and all similar components related to munitions that were designed to cause damage to personnel or material through explosive force, incendiary action, or toxic effects. Non-containerized high explosives, propellants, or soils contaminated with explosive constituents are considered explosives if the concentration of explosive material is ten percent or higher.

DEFINITIONS
(Continued)

Ordnance and Explosive Metal Debris—Ordnance materials which have not been in direct contact with the energetic materials of the ordnance, such as bomb fins, grenade spoons, shipping containers, and so forth.

Ordnance and Explosive Waste—Ordnance materials which have been in direct contact with the energetic materials of the ordnance, such as expended rocket motors, shell casings, warhead fragments, powder containers, and so forth.

Practice Ordnance—Munitions that demonstrate characteristics similar to their high explosive counterparts and that may or may not contain pyrotechnic, explosive, or chemical (that is, titanium tetrachloride) spotting charges.

Unexploded Ordnance (UXO)—Military munitions that have been primed, fused, armed, or otherwise prepared for action that have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material, and that remain unexploded either by malfunction, design, or any other cause. For the purpose of this project, the definition of UXO is limited to items larger than 50-caliber.

UXO Personnel—Any individual who has graduated from a Department of Defense (DoD)-approved UXO specialist course. Examples are the U.S. Naval Explosive Ordnance Disposal School, Indian Head, Maryland, the International UXO Training Program, or Texas A&M University.

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish procedures for the disposition of recovered ordnance and explosives waste (OEW) in support of characterization activities at Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California, by Foster Wheeler Environmental Corporation (FWENC). The primary consideration of this SOP is the protection of human health and the environment.

2.0 SCOPE

The vegetation on IR Site 1 will be cut to a height of 4 inches (or less) prior to the beginning of the surface OEW investigation. FWENC unexploded ordnance (UXO) personnel will proceed ahead of the mowing equipment to prevent encountering OEW. Following the locating, marking, and mapping of the corner points of the site using existing Global Information System (GIS) data, a local Cartesian Coordinate grid system will be established to enable the UXO specialists conducting the surface investigation to identify relative positions of OEW, if any are located. The coordinate axes will have an origin on the southwestern corner of the site and will be spaced 100 feet apart, creating a network of 100 x 100-foot grids. The Y-axis will run north-to-south, the X-axis east-to-west, and the points where grid lines intersect will be marked with surveyors flags. UXO Specialists will prosecute the site in a line abreast, spaced sufficiently near one another to ensure complete visual coverage as the sweep line navigates systematically through the grid. If any OEW is encountered, its location will be referenced by an abscissa/ordinate intersection point using the appropriate alphanumeric label of the grid's placement within the coordinate system.

3.0 PERSONNEL REQUIREMENTS

The key operational, on-site FWENC personnel involved in the performance of explosive demolition operations include the Site Superintendent/Senior UXO Supervisor (SUXOS), Site Health and Safety and Specialist/Quality Control Representative (SHSS/QCR), UXO Supervisor, and UXO Specialists.

Site Superintendent

FWENC's Site Superintendent is ultimately responsible for the on-site health and safety of FWENC personnel working on this project. The Site Superintendent, with the support of FWENC's SHSS, is responsible for implementation of the Remedial Investigation (RI) Work Plan, Site-Specific Health and Safety Plan (SHSP), and all on-site activities on a daily basis. Other responsibilities include, but are not limited to: (1) project planning, (2) scheduling, (3) site documentation, (4) regulatory compliance, (5) personnel assignments, (6) customer and subcontractor relations, (7) enforcing health and safety rules and SHSP requirements, and (8) conducting routine safety inspections and incident investigations. The Site Superintendent reports directly to the Project Manager (PjM).

Senior UXO Supervisor

For this project, The SUXOS will act as the Site Superintendent. He assists in the development of site-specific work plans, identifies personnel and equipment requirements, and directly supervises all daily activities of the field team. The SUXOS is responsible for the successful performance of the field team, the early detection and identification of potential problem areas, and instituting corrective measures. The SUXOS is also responsible for execution of instructions received from the FWENC PjM and the Navy's Remedial Project Manager (RPM), documentation of site conditions, photographing UXO recovery, preparation of all project reports, and identifying any effort required to accomplish the Scope of Work. The SUXOS is responsible for all aspects of explosive safety.

Site Health and Safety Specialist/Quality Control Representative

The SHSS/QCR is UXO-qualified and is responsible for the implementation of the SHSP, on-site training requirements, and recommending changes to level of PPE to the certified industrial hygienist (CIH) as site conditions warrant. The SHSS/QCR has Stop Work authority for safety conditions. The SHSS/QCR evaluates and analyzes any potential safety problems, implements safety-related corrective actions, and maintains a daily safety log. The SHSS/QCR is also responsible for the implementation of the *Project Contractor Quality Control Plan* (FWENC, 2001).

UXO Supervisor

The UXO Supervisor is responsible for the field work assigned to his team. He reports directly to the Senior UXO Supervisor.

UXO Specialist

The UXO Specialist performs on-site duties including locating UXO, equipment operation, UXO safety, excavation, and escort duties as required. The UXO Specialist reports to the SUXOS.

All personnel involved in demolition operations will become familiar with and follow the procedures outlined in this SOP and applicable references.

3.1 TRAINING REQUIREMENTS

All personnel assigned to the site investigation will attend a site-specific orientation. The purpose of this orientation will be to review site-specific and emergency response procedures. Orientation attendance sheets with attached training schedule will be used to document completion of each orientation session. The topics to be covered during the orientation are provided as follows:

- Introduction
- Operation overview
- SHSP review
- Review Work Plan
- Review Site Health and Safety Plans
- Review SOP
- Safety precautions
- Equipment training
- QA/QC training
- Emergency procedures
- Review of emergency response equipment
- Talk/walk through of emergency procedures
- Emergency drill

All personnel assigned to the project are responsible for reading and understanding the Work Plan. After reading the work plan, the Site Supervisor/SUXOS will sign and date the Field Supervisor Review Sheet found in Attachment 1 and all other site personnel will sign and date the Field Team Review sheet found in Attachment 2. These sheets will be filed in project files.

4.0 OPERATIONAL CONSIDERATIONS

4.1 NOTIFICATION, SCHEDULING, AND COORDINATION

Coordination of all personnel involved in the IR Site 1 investigation will be vital to the safe conduct of site activities. The OEW investigative effort by FWENC will ensure that IR Site 1 on Alameda Point will be safe for the intended use of the land. Coordination activities will begin with a series of meetings with all involved parties and agencies to identify shared and individual responsibilities. The community will be informed of the project schedule and the expected impacts. The coordination, notification, and verification activities are outlined below:

- **Coordination Meeting**—Before OEW investigative operations are scheduled to begin, a coordination meeting will be conducted to address specific elements of planning and will involve representatives from the following organizations:
  - NAS Caretaker/Environmental Compliance Manager (ECM)
  - U.S. Environmental Protection Agency (EPA)
  - Regional Water Quality Control Board (RWQCB)
  - Department of Toxic Substances Control (DTSC)
  - The City of Alameda
  - FWENC
- **Topics** will include:
  - Explosive handling and transportation
  - Required support services, fire, medical, security, and so forth
  - Notifications
  - Community impact
  - Daily hours of operation
  - Exclusion zone procedures
  - Emergency procedures
- **Notifications**—The FWENC SUXOS will notify the appropriate personnel prior to scheduled investigative activities as far in advance as possible to facilitate timely coordination arrangements for establishing the exclusion zone and closing required roads. The SUXOS will ensure that the following activities/agencies are informed of the planned field activities:
  - Concentra Medical Center (510) 465-9585
  - Alameda Fire Department (510) 522-2423
  - Alameda Police Department (510) 748-4508
  - NAS Alameda (ECM) (510) 772-8832

- **Daily Verification**—Prior to beginning each day's activities, the FWENC Command Center will verify daily that the following activities have been performed:
  - Emergency response activities have been notified and are available
  - Exclusion zones have been set and evacuated as required

4.2 EQUIPMENT/MATERIAL REQUIREMENTS

The SUXOS will inspect health and safety equipment prior to commencing operations. Two equipment checklists will be used to ensure a proper load-out is accomplished before departing for investigative operations. A Daily Equipment Checklist is provided in Attachment 3, and a Daily Health and Safety Equipment Checklist is provided in Attachment 4. It is anticipated that all tasks will be performed in Level D personal protective equipment (PPE). The following publications are required to be on-site:

- Approved RI Work Plan with this SOP
- Explosive ordnance disposal basic (EODB) 60A-1-1-4, *Protection of Personnel and Property*
- EODB 60A-1-1-31, *General Information on Explosive Ordnance Disposal (EOD) Disposal Procedures*
- Naval Sea Systems Command (NAVSEA) OP 5 Volume 1

4.3 UXO/OEW IDENTIFICATION

The SUXOS will perform Explosive Ordnance Reconnaissance (EOR) procedures and assessment of all suspect UXO/OEW to determine conditions and potential hazards. If the UXO/OEW encountered is unsafe to move/transport, it will be detonated in place, if possible. The Senior UXO Supervisor will notify the Alameda Environmental Compliance Manager and the United States Air Force (USAF) EOD Detachment located on Travis Air Force Base (AFB) to dispose of all unsafe to move/transport items encountered during the field investigation. If the UXO/OEW is safe to move/transport, it will be transported to the magazine area for consolidation and shipment by FWENC UXO personnel.

4.4 EXPLOSIVES OR MUNITIONS EMERGENCY RESPONSE

If it is determined that encountered OEW is unsafe to move or transport, and that it poses an immediate threat to human health, public safety, property or the environment, the USAF EOD Detachment from Travis AFB will be called to conduct an explosives or munitions emergency response (EMER) to control, mitigate, or eliminate the threat. [40 Code of Federal Regulations (CFR) 260.10] The following procedures will be used to coordinate the response:

- The SUXOS will establish an exclusion zone of appropriate distance for the type and size of OEW encountered

- The site will be clearly marked with stakes and surveyor's tape
- Gates to the site will be closed and barriers placed in front of them
- The SUXOS will contact the following personnel/agencies:
  - Concentra Medical Center (510) 465-9585
  - Alameda Fire Department (510) 522-2423
  - Alameda Police Department (510) 748-4508
  - Alameda Point ECM (Doug Delong) (510) 772-8832
  - Travis AFB Command Post (707) 424-5517
  - Travis AFB EOD Detachment (707) 424-2040/3146
  - RPM (Rick Weissenborn) (619) 532-0952
  - Project Manager (Abid Loan) (949) 756 7514
  - Associate Project Manager (Lance Humphrey) (619) 471-3519
  - DTSC (Daniel Murphy) (510) 540-3772

FWENC UXO Technicians will assist the Alameda ECM and the USAF EOD Detachment as required.

4.5 HANDLING, TRANSPORTATION, AND STORAGE

All UXO/OEW declared safe to move will be consolidated in the grid found and transported to on-site storage magazines in adherence to all applicable federal and state regulations, licensing, standards, and protocols. It should be noted that safe-to-move does not always mean safe-to-transport. The Senior UXO Supervisor will make this determination.

4.5.1 Explosive Transport Vehicle

The Explosive Transport Vehicle will be a pick-up truck (for example, Ford F-150) equipped with sand bags and wood boxes to prevent explosive items from coming into contact with spark producing materials. The vehicle shall be inspected prior to transporting any explosive ordnance items to ensure the following:

- Brakes are set and the wheels chocked while loading and unloading
- The vehicle's engine is turned off during any loading or unloading process
- Four appropriate Department of Transportation (DOT) warning placards are temporarily attached to the vehicle prior to any transport of explosive items
- A cellular telephone and a two-way radio that are compatible with any escort vehicle that may be assigned during transport of explosives will be available
- Emergency warning triangles, barricade tape, first aid kit, wheel chocks, general purpose tool kit, and tow chain are readily available

- Two multipurpose, dry-chemical fire extinguishers or two class IA-10BC fire extinguishers are in the vehicle
- Sufficient sand bags are in place to chock the container in the vehicle bed
- A fire resistant bed cover/tarpaulin is available to cover the explosive item after it has been secured within the truck bed

4.5.2 Inspection and Certification

Each explosive item scheduled for transport to the magazine area shall be inspected, certified, and documented by the Senior UXO Supervisor as safe to transport.

4.5.3 Packaging

Explosive items will be placed within a wooden container. A typical container would be a rectangular box with rope-type grab handles. The container will be overpacked to a zero head space with #2 granulated all-purpose sand to prevent a single item from moving within the confines of the container. The sand is added to all sides, front and bottom to act as a shock stabilizer, heat insulator and friction eliminator. A minimum of 3 inches of sand will surround each item secured within the container. The container will then be hand-loaded into the truck bed. Sand bags will be placed around the sides to chock the wooden container in place and additional sand bags will be placed on top of the container to prevent movement of the container during transport.

4.5.4 UXO/OEW Storage

Recovered UXO/OEW that has been deemed safe to move and safe to transport will be transported to the magazine (M353 or M354) area for consolidation and temporary storage. The magazine will be certified for the storage of Class/Division 1.1 materials and it will be used for the storage of mixed compatibility materials. Physical separation within the magazine will be used for non-compatible items (that is, physical barriers will be constructed using sandbags to isolate the different compatibility groups recovered) and the material will be stowed on pallets. At no time will the rated explosive capacity of the magazine be exceeded. The magazines will be locked with Sargent & Greenleaf Model 833 High Security Padlocks that meet MIL-P-43607G specifications for High Security Key Locking Padlocks. The SUXOS will maintain custody of the keys. The fenced compound that encloses the magazines will also be padlocked and the two access gates that provide access to the magazine compound will be locked as well. Access to the area is restricted to Base Caretaker Personnel.

4.5.5 Inventory

An inventory of the recovered UXO/OEW will be maintained inside the storage magazines and at the on-site office trailer using the Ordnance Accountability Inventory found in Attachment 6. The inventory will be updated each time a recovered item is placed in a magazine or is removed from a magazine. The period of temporary storage for encountered OEW will be less than 60 days.

4.6 PACKAGING

Upon the completion of investigative activities on Site 1, if any OEW has been encountered, it will be packaged and manifested in accordance with applicable federal and state requirements, and shipped to NAVSEA Crane, Indiana for final disposition. The following documentation is required for shipment:

- Section 1 of the Hazardous Waste Profile Sheet completed (with documentation used to establish composition of the waste)
- Land Disposal Restriction Certification completed
- Documentation establishing DOT Hazard classification, proper shipping name and packaging requirements

Accredited and pre-approved subcontractors will be used for the packaging and shipping of the OEW. Amplifying information concerning the shipment of waste military munitions will be maintained by the SUXOS in project files maintained in the site trailer.

4.7 COMMUNICATIONS

Communications equipment consisting of cellular telephones and hand-held radios will be available for emergency communications with fire and medical support activities.

4.8 FIRE FIGHTING

- Do not fight any fires that involve explosives
- Notify the Alameda Fire Department prior to conducting demolition operations and contact them immediately upon the discovery of a fire
- Ensure that the fire fighting equipment listed on Attachment 4 (Daily Health and Safety Checklist) is loaded into the vehicles prior to departing for site activities.

4.9 EMERGENCY MEDICAL SUPPORT

The ambulances from Concentra Medical Center or fire trucks from the Alameda Fire Department (located on the former NAS Alameda) will be the first responders for emergency medical support. They can be contacted by dialing 911. A complete first-aid kit will be

maintained on-site and at least two UXO Technicians will be trained in CPR and first aid procedures.

4.10 FIRE SUPPORT

The Alameda Fire Department located on NAS Alameda will be notified (510-522-2423) prior to disposal operations. No attempt will be made to extinguish a fire involving explosives until the explosives have been consumed.

4.11 PERSONAL PROTECTIVE EQUIPMENT

All demolition operations will be conducted in Level "D" PPE with safety glasses.

4.12 RECORDKEEPING

If any OEW is encountered during the surface investigation, the first section of the UXO Acquisition and Accountability Log form found in Attachment 6 will be completed detailing the type and location of the OEW. The OEW will be photographed and attached to the form. When disposition of the OEW is accomplished, the form will be completed, either for transfer or destruction.

4.13 TWO-MAN RULE

The two-man rule is a concept of fail-safe, where two knowledgeable individuals perform potentially hazardous operations in which each is the safety backup and watch person for the other. The two-man rule shall apply whenever OEW is handled or transported.

4.14 OEW SCRAP

OEW scrap (shrapnel, fins, expended munitions) will be controlled and accounted for from discovery to disposal. Items identified as OEW scrap will be inspected, removed from the site, containerized and kept in the OEW scrap storage area between Magazines M353 and 354 until it is shipped to an approved processing facility (recycler). All OEW scrap will be documented on the UXO Acquisition and Accountability Log (Attachment 5) and on the Ordnance Accountability Inventory (Attachment 6) when it is transferred to the storage area.

4.15 ENGINEERING CONTROLS

Engineering controls (tamping, wetting the soil, tarpaulin-tenting, etc.) will be used to limit/control the spread of dust and soil-borne contaminants (if present) during emergency Blow in Place operations. FWENC UXO and USAF EOD personnel will determine the type of controls that will be used based on the situation encountered.

4.16 CONTINGENCY PLAN FOR LARGE OEW

Should large OEW be encountered that is unsafe to move, the exclusion zone (EZ) will be expanded and evacuated prior to conducting Blow-In-Place (BIP) procedures. The SUXO will adjust the EZ as the situation dictates, but the size and type of OEW will generally determine the size of the EZ. For fragmenting explosive materials, the EZ will be established at 2,500 feet. For bombs and projectiles greater than 5 inches in caliber, the EZ will be expanded to 4,000 feet.

If an evacuation of an exclusion zone of 2,500 to 4,000 feet is required, the Alameda Fire and Police Departments will be notified and their assistance requested in conducting the evacuation. The following agencies/personnel will be notified if an evacuation is required:

- Concentra Medical Center (510) 465-9585
- Alameda Fire Department (510) 748-4601(Police/Fire Dispatch)
- Alameda Police Department (510) 748-4508
- Alameda Point ECM (Doug Delong) (510) 772-8832
- Travis AFB Command Post (707) 424-5517
- Travis AFB EOD Detachment (707) 424-2040/3146
- RPM (Rick Weissenborn) (619) 532-0952
- EPA (Anna Marie-Cook) (415) 744-2367
- DTSC (Daniel Murphy) (510) 540-3772
- Project Manager (Abid Loan) (949) 756 7514
- Associate Project Manager (Lance Humphrey) (619) 471-3519

The Alameda Police/Fire Dispatch Office will coordinate all evacuation efforts and will contact other fire and police agencies as required. FWENC UXO personnel will assist the responding military EOD unit and the law enforcement agencies in preparing for the BIP operation and evacuating the exclusion zone. The FWENC SUXOS and EOD Commander will brief Police and Department officials on the planned BIP procedures and activities will not commence until the Alameda Police Department Watch Commander has verified the evacuation of the exclusion zone and given the EOD unit permission to proceed with the operation.

Engineering controls will be used to control fragmentation, if possible. The FWENC SUXOS and the EOD Commander will determine the type of control(s) used and FWENC UXO Technicians will assist EOD personnel in the emplacement of those controls.

5.0 QUALITY CONTROL

Quality control (QC) is performed to ensure that encountered OEW was transported and stored in accordance with applicable regulations and directives. The SUXOS and SSHS/QCR will ensure that procedures are implemented as listed below:

- Certify UXO team conducting surface investigation operations in accordance with procedures described in the CQC plan
- Conduct Surface Clearance Effectiveness Tests during investigative operations as prescribed in the CQC plan
- Perform follow-up QC for on-site packaging, transportation and storage
- Complete data entry on the UXO Acquisition and Accountability Log (Attachment 5)
- Complete data entry on the Ordnance Accountability Inventory (Attachment 6)

6.0 GENERAL SAFETY PRECAUTIONS

This section provides the following general safety precautions for explosive disposal operations:

- Know and observe federal, state, and local laws, and regulations which apply to the transportation, storage, and usage of explosives.
- Do not permit metal, except approved metal truck bodies, to contact explosive containers.
- Do not transport metal, flammables, or corrosive substances with explosives.
- Do not allow smoking, or the presence of unauthorized or unnecessary persons, in vehicles containing explosives.
- Do not store explosives, fuse, or fuse lighters in a wet or damp place, or near oil, gasoline, cleaning solution or solvents, or near radiators, steam pipes, exhaust pipes, stoves, or other sources of heat.
- Do not store any sparking metal or sparking metal tools in an explosive magazine.
- Do not permit smoking, matches, or any source of fire or flame in or near an explosive magazine.
- Do not allow leaves, grass, brush, or debris to accumulate within 50 feet of an explosive magazine.
- Do not permit the discharge of firearms in the vicinity of an explosive magazine.
- Do not place OEW where they may be exposed to flame, excessive heat, sparks or impact.
- Do not expose OEW or devices containing OEW, to the direct rays of the sun. Such exposure increases sensitivity and deterioration.
- Ensure that OEW are returned to their proper containers and the containers are closed after use.
- Do not carry OEW, or explosive components in pockets or elsewhere on the body.
- Do not insert anything but fuse or detonating cord into the open end of a blasting cap.
- Carefully load and unload OEW from vehicles. Never throw or drop OEW from the vehicle.
- Do not drive vehicles containing OEW through cities, towns, or villages, or park them near such places as restaurants, garages, and filling stations, unless absolutely necessary.
- Store OEW only in a magazine that is clean, dry, well-ventilated, reasonably cool, properly located, substantially constructed, bullet and fire resistant, and securely locked.

- Ensure the Exclusion Area is clear of any unauthorized personnel before beginning investigative activities.
- Do not handle, use, or remain near OEW during the approach or progress of an electrical storm.
- Do not transmit on a radio within the Hazardous of Electromagnetic Radiation to Ordnance (HERO) distance of that radio. Do not turn the cellular telephone within 10 feet of any OEW.

The two-man rule shall apply whenever OEW is handled or transported and during disposal operations on or off the range.

7.0 REFERENCES

Foster Wheeler Environmental Corporation (FWENC). 2001. *Draft Final Project Contractor Quality Control Plan, Visual Surface Characterization and Geotechnical and Seismic Evaluations at Installation Restoration Site 1. Alameda Point, Alameda, California.* San Diego, California.

Navy Explosive Ordnance Disposal (NAVEOD). 1990. *Explosive Ordnance Disposal Procedures, Protection of Personnel and Property.* (Publication 60A-1-1-4, Revision 2). Indian Head, Maryland: Naval Explosive Ordnance Disposal Technology Division.

NAVEOD. 1994. *Explosive Ordnance Disposal Procedures, General Information on EOD Disposal Procedures.* (Publication 60A-1-1-31). Indian Head, Maryland: Naval Explosive Ordnance Disposal Technology Division.

Naval Sea Systems Command (NAVSEA). 1995. *Demolition Materials.* (NAVSEA SW060-AA-MMA-010, Third Revision). Washington D.C.: Naval Sea Systems Command.

_____. 1997. *Ammunition and Explosives Ashore; Safety Regulations for Handling, Storing, Production, Renovation and Shipping.* (NAVSEA OP5, Volume 1. Indian Head, Maryland: Naval Ordnance Center.

ATTACHMENT 1

FIELD SUPERVISOR REVIEW SHEET

ATTACHMENT 1

FIELD SUPERVISOR REVIEW SHEET

I have read the Project Work Plan and the Standard Operating Procedure 1 (SOP-1) for OEW/UXO Disposal Disposition. I understand it. To the best of my knowledge the processes described in the Work Plan and this SOP-1 can be done in a safe, healthful, and environmentally sound manner. I have made sure all persons assigned to this process are qualified, have read and understand the requirements of the Work Plan and SOP-1, and have signed the worker's statement for this process. If necessary, I will conduct an annual review of the Work Plan and SOP-1. If deviations from this SOP-1 are necessary, I will ensure that project activities are stopped until the SOP-1 is revised and approved. If unexpected safety, health, or environmental hazards are found, I will ensure that project activities are stopped until the hazards have been eliminated.

SUPERVISOR'S NAME	SIGNATURE/DATE

ATTACHMENT 2

FIELD TEAM REVIEW SHEET

ATTACHMENT 2

FIELD TEAM REVIEW SHEET

Each field team member shall sign this section after site-specific training is completed and before being permitted to work on-site.

I have read the Project Work Plan and Standard Operating Procedure 1 (SOP-1) for OEW/UXO Disposal Disposition and I have received the hazard control briefing. I understand them. I will follow the Work Plan and SOP-1 unless I identify a hazard not addressed in it or encounter an operation I do not understand. If that occurs, I will stop site activities and notify my immediate supervisor of the problem.

WORKER'S NAME	SIGNATURE/ DATE	SUPERVISOR'S NAME	SIGNATURE/ DATE

ATTACHMENT 3

DAILY
EQUIPMENT CHECKLIST

ATTACHMENT 3

DAILY EQUIPMENT CHECKLIST

Date: _____ **Disposal Supervisor:** _____

Equipment	Quantity	Comments
Explosive vehicle	3	
Personnel vehicle	1	
Camcorder/digital camera	1	
Air horn	4	
Bravo Flag (Red)	2	
Hand-held radios	2	
Ruler, 24-inch	1	
Schonstedt locator	1	
Shovel, round point, long handle	3	
Shovel, round point, short handle	1	
Tape, duct	6	
Tape, measuring, 50- or 100-meter	3	
Tape, plastic	6	
Toolbox, general hand tools	1	
Knife	1	

ATTACHMENT 4

DAILY HEALTH AND SAFETY EQUIPMENT CHECKLIST

ATTACHMENT 4

DAILY HEALTH AND SAFETY EQUIPMENT CHECKLIST
(As Required)

Date: _____ **Disposal Supervisor:** _____

Equipment	Quantity	Comments
Air horn, emergency	1	
Booties, rubber slip-on (1 pair per person)	1	
Burn gel	2	
Burn kit	1	
Compress, 18 x 36 inches	2	
Compress, 8 x 10 inches	2	
CPR kit	1	
Decontamination sprayer	2	
Emergency eye wash	1	
Eye wash, 15-minute	1	
Fire blanket	1	
Fire extinguisher, 10-pound	1	
First aid kit, 10-person	1	
Gauze pads, 3 x 3 inches	12	
Gloves, latex	12	
Gloves, leather	12	
Gloves, nitrile	5	
Goggles	5	
Hard hat	5	
Radios, hand held	3	
Rain suit	5	
Safety vest	5	
Stretcher	1	
Tape	6	
Triangular bandages	6	
Voltage detector	1	
Water, 5-gallon bottle (emergency shower)	2	
Water, drinking 1 liter per person	6	

ATTACHMENT 5

UXO ACQUISITION AND ACCOUNTABILITY LOG

ATTACHMENT 5

UXO ACQUISITION AND ACCOUNTABILITY LOG

Delivery Order No.: _____ **Report No.:** _____

UXO TEAM: _____ **Date:** _____

ACQUISITION DATA

Grid Number	
Ordnance length (inches)	
Ordnance diameter (inches)	
Weight (lbs/oz)	
Ordnance type (bomb, rocket, projectile, hand grenade, mortar, rifle grenade, pyrotechnics, small arms, and so forth)	
Photo roll number/disk number	
Photo exposure number/digital file number	
Video marker – Start	
Video marker – Stop	
Ordnance description	

UXO DISPOSITION

SAFE HOLDING AREA	DATE	INITIAL	TRANSFERRED TO	DATE	SIGNATURE

DESTROYED BY	DATE	SIGNATURE

Comments: _____

_____

_____

Senior UXO Supervisor _____

ATTACHMENT 6

ORDNANCE ACCOUNTABILITY INVENTORY

ATTACHMENT 6

ORDNANCE ACCOUNTABILITY INVENTORY

Date: _____							
RPT #	**Item**	**Category***	**Found**	**Location**	**Initial Disposition**	**Photo #**	**Final Disposition /Date**

Notes:

* UXO – Unexploded Ordnance - Ordnance fused, armed, or otherwise prepared for action and which has been fired or placed in such manner that constitutes a hazard.
AO – Abandoned ordnance – Ordnance which were disposed of by abandonment. The ordnance may or may not have been fused or armed, but was not employed as designed.
Inert – An item that has the same physical features of an ordnance item, but does not and never did contain energetic material.
OEW Scrap – Ordnance material that contained or was in contact with energetic material which has been expended.
RPT – Report

STANDARD OPERATING PROCEDURE

DRILLING, GEOTECHNICAL SAMPLING, AND TESTING

(SOP-2)

Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

CONTRACT NO. N44255-95-D-6030
DO NO. 0095

FINAL

STANDARD OPERATING PROCEDURE
DRILLING, GEOTECHNICAL SAMPLING, AND TESTING
(SOP-2)
Revision 1
September 28, 2001

ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1 ALAMEDA POINT ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

1230 Columbia Street, Suite 640
San Diego, CA 92101

Tajma Vaughns-Rachal
Geotechnical Engineer

Abid Loan
Project Manager

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ABBREVIATIONS AND ACRONYMS

AHA	Activity Hazard Analysis
ASTM	American Society for Testing and Materials
DGPS	Digital Global Positioning System
DOT	Department of Transportation
EMM	Earth Moving Machinery
FWENC	Foster Wheeler Environmental Corporation
HSA	hollow-stem auger
IR	Installation Restoration
NAS	Naval Air Station
OU	Operable Unit
oz	Ounce
SOP	Standard Operating Procedure
SPT	Standard Penetration Test
UXO	Unexploded Ordnance

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish procedures for drilling operations, geotechnical sampling activities, and testing methods in support of characterization activities at Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California by Foster Wheeler Environmental Corporation (FWENC).

Specific objectives of this SOP are:

- Drilling of boreholes using a hollow-stem auger (HSA)
- Sampling of soil from boreholes and test pits
- Geotechnical testing of soil samples

2.0 SCOPE

Field investigations will be conducted to collect geotechnical data, which will involve drilling ten soil borings and excavating eight test pits at IR Site 1. Representative disturbed and undisturbed soil samples will be retrieved for geotechnical analyses. Geotechnical testing will be performed on selected soil samples and will consist of moisture/density, particle-size analysis with hydrometer, Atterberg limits, organic content, modified proctor compaction, triaxial permeability, saturated hydraulic conductivity (if necessary), and triaxial shear tests. Metal avoidance procedures will be used to prevent damage to equipment.

3.0 DRILLING/GEOTECHNICAL SAMPLING

The general requirements and procedures are designed to provide consistent and representative guidance while performing drilling and geotechnical sampling activities. This section describes equipment requirements and specific procedures for both upland and offshore borehole drilling.

3.1 GEOTECHNICAL EQUIPMENT REQUIREMENTS

1. Field logbook, sample logbook, boring log forms, sample tags/labels, and chain-of-custody forms
2. Indelible ink pens and markers
3. Bubble wrap, newspaper or other packing material
4. Bulk, moisture proof sample bags (weight contained: 75 pounds)
5. Bulk, moisture proof sample bags (weight contained: 20 pounds)
6. Ziploc bags
7. Camera
8. Barge for off-shore borings
9. Drill rig equipped for standard penetration test (SPT), Shelby tube sampling and piston sample
10. Magnetometer (for upland drilling sites)
11. Split-spoon samplers
12. Sample containers (Shelby tubes and plastic sample jars)
13. Sampling equipment to include sample
14. Assorted geology supplies (hand lens, grain-size card, Munsell color chart, for example)

3.2 TYPICAL PROCEDURES FOR OFFSHORE DRILLING/GEOTECHNICAL SAMPLING

1. Conduct site health and safety meeting with Activity Hazard Analysis (AHA).
2. Calibrate field instrumentation.
3. Mobilize drill rig on to barge for offshore drilling.
4. Mobilize equipment and supplies to drilling location.
5. Anchor barge (vessel) at drilling location.
6. Record necessary data in field logbook including site coordinates using digital global positioning system (DGPS).
7. Drill to first sampling depth, as determined by the on-site geologist.

8. If split-spoon sampling is to be performed at this depth, place decontaminated split-spoon sampler on center rods.

9. Drive split-spoon sampler as specified in the American Society for Testing and Materials (ASTM) Method D1586. Drive the length of the entire sampler or to refusal (as defined in ASTM D1586). Record blow counts on boring log form. Fine-grained samples for shear strength testing should be collected by thin-walled tubes in accordance with ASTM Test Method D 1587.

10. Open the split-spoon sampler and record the length of sample recovered. Take photographs of representative samples and of unique samples.

11. Describe sample in accordance with ASTM D2488-93 on the boring log form. If the sediment type changes within the length of sample, describe each type and record the lengths of each sample type.

12. Place each type of sediment into 8-ounce (oz) plastic jars or plastic resealable bags.

13. For Shelby tube samples, drill to the sampling depth, and push the Shelby tube the length of the entire sampler to refusal. Retrieve tube, measure length of soil recovered, record soil types in the end of the tube, cap the ends, and label ends with up arrow and appropriate depths.

14. Decontaminate all equipment used during offshore drilling activities with a saltwater rinse.

15. Document activities in the field logbook.

3.3 TYPICAL PROCEDURES FOR UPLAND DRILLING/GEOTECHNICAL SAMPLING

1. Conduct site health and safety meeting with AHA.

2. Calibrate field instrumentation,

3. Take pre-activity photographs for documentation.

4. Unexploded ordnance (UXO) Technicians will clear the work site of metal debris. After finding a location the magnetometer indicates is free of detectable metal, the drill hole will be started with a hand-held auger. At a depth of 2 feet, the magnetometer probe will be inserted into the borehole and checked for metal. This procedure will be repeated until the depth of the hand-held auger is reached, about 4 feet.

5. Mobilize equipment and supplies to drilling location.

6. Position the drill rig over the borehole and auger down to maximum depth of 8 feet.

7. Pull the drill string and relocate the drilling rig at least 20 feet away from the borehole. The magnetometer probe will be lowered into the hole to check for metal. If clear of metal, reposition the drilling rig over the hole and commence drilling.

(This procedure will be repeated every 4 feet until a depth of 20 feet is reached, or to the first sampling depth (less than 20 feet), as determined by the on-site geotechnical engineer/geologist. After reaching 20 feet, drill to sampling depth, as determined by the

on-site geologist. If boring location is not clear of metal, drilling shall cease and a new boring location will be sited and discussed.)

8. Record necessary data in field logbook, including weather and type of equipment used.
9. If split-spoon sampling is to be performed at this depth, place decontaminated split-spoon sampler on center rods.
10. Drive split-spoon sampler as specified in the ASTM Method D1586. Drive the length of the entire sampler or to refusal (as defined in ASTM D1586). Record blow counts on boring log form.
11. Open the split-spoon sampler and record the length of sample recovered. Take photographs of representative and unique samples.
12. Describe sample in accordance with ASTM D2488-93 on the boring log form. If the soil type changes within the length of sample, describe each type and record the lengths of each sample type.
13. Place each type of soil into 8 oz plastic jars or plastic resealable bags.
14. For Shelby tube samples, drill to the sampling depth, and push the Shelby tube the length of the entire sampler to refusal. Retrieve tube, measure length of soil recovered, record soil types in the end of the tube, cap the ends, and label ends with up arrow and appropriate depths.
15. For bulk samples, place each soil type into moisture proof bags.
16. Split sample of about one pound and place in a plastic Ziploc bag or 8 oz sample jar.
17. Twist and tape the bags closed.
18. Affix a sample identification label.
19. Decontaminate all equipment used during terrestrial drilling activities with a water rinse. If equipment is in contact with hazardous waste or refuse, use a combination of Alconox, deionized water, and a water rinse.
20. Repeat steps 4-19 to a maximum depth of 50 feet, or greater, when applicable.
21. Document activities in the field logbook.
22. Take post-activity photographs of the exploration location to document any changes in environmental conditions as a result of drilling/excavation activities.

3.4 TYPICAL PROCEDURES FOR UPLAND TEST PIT DRILLING AND GEOTECHNICAL SAMPLING

1. Conduct site health and safety meeting with AHA.
2. Take pre-activity photographs for documentation.
3. Mobilize Earth Moving Machinery (EMM) and supplies to the test pit location,.

4. UXO Technicians will clear the worksite of metal debris. After finding a location the magnetometer indicates is free of detectable metal, the soil will be removed in 1-foot lifts. UXO technicians will check the pit with the magnetometer after each lift. Metal detected within 1 foot of the surface will be hand-excavated to determine if it could cause damage to the EMM.
5. Record necessary data in field logbook, including weather and type of equipment used.
6. Use a hand trowel to sample soil from the backhoe bucket. Do not enter the test pit.
7. Place each soil type into moisture proof bags.
8. Split sample of about one pound and place in a plastic Ziploc bag or 8 oz sample jar.
9. Twist and tape the bags closed.
10. Affix a sample identification label.
11. Describe sample in accordance with ASTM D2488-93 on the boring log form. If the soil type changes within the bucket, describe each type and record on the test pit form.
12. Describe test pit walls on test pit form. Take photographs of test pit walls and record wall direction(s).
13. Decontaminate all equipment used during terrestrial drilling activities with a water rinse. If equipment is in contact with hazardous waste or refuse, use a combination of Alconox, deionized water, and a water rinse.
14. Repeat steps 4-13 to a maximum depth of 4 feet.
15. Document activities in the field logbook.
16. Take post-activity photographs of the exploration location to document any changes in environmental conditions as a result of drilling/excavation activities.

4.0 SHIPPING AND HANDLING OF SAMPLES

The general requirements and procedures are designed to provide consistent and representative guidance while shipping and handling geotechnical samples. This section describes equipment requirements and specific procedures for shipping and handling samples.

4.1 REQUIRED EQUIPMENT FOR SHIPPING AND HANDLING OF MATERIALS

1. Field logbook, sample logbook, sample tag, and labels
2. Chain-of-custody forms
3. Indelible ink pens and markers
4. Bubble wrap, newspaper or other packing material
5. Bulk, moisture proof sample bags (weight contained: 75 pounds)
6. Bulk, moisture proof sample bags (weight contained: 20 pounds)
7. Ziploc bags

4.2 TYPICAL PROCEDURES FOR SHIPPING AND HANDLING OF SAMPLES

1. Place each sample in a plastic Ziploc bag and align the label so it can be easily read.
2. Wrap each sample with bubble wrap, newspaper, or other packing material.
3. Notify laboratory of the approximate time and date of sample arrival.
4. Ship samples in a sturdy, watertight container.

5.0 GEOTECHNICAL TESTING

The general requirements and methods are designed to provide consistent and representative guidance while adhering to required geotechnical testing activities. This section describes specific methodology required for geotechnical testing.

5.1 GEOTECHNICAL TESTING

The laboratory shall follow the following ASTM Standards for geotechnical testing:

1. D422-63 Test Method for Particle-Size Analysis of Soils with Hydrometer
2. D1557-91 Compaction Characteristics Using Modified Effort (Modified Proctor)
3. D2937-00 Moisture/Density
4. D2974-00 Organic Content
5. D5084-90 Saturated Hydraulic Conductivity
6. D4767 Consolidated Undrained Triaxial Shear
7. D2850-95 Unconsolidated, Undrained Triaxial Shear
8. D2216-92 Water Contents
9. D4318-95a Atterberg Limits

STANDARD OPERATING PROCEDURE

CONE PENETROMETER TESTING

(SOP-3)

Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

CONTRACT NO. N44255-95-D-6030
DO NO. 0095

DRAFT FINAL

STANDARD OPERATING PROCEDURE
CONE PENETROMETER TESTING
(SOP-3)
Revision 0
August 20, 2001

ORDNANCE AND EXPLOSIVES WASTE CHARACTERIZATION, AND GEOTECHNICAL AND SEISMIC EVALUATIONS AT INSTALLATION RESTORATION SITE 1 ALAMEDA POINT ALAMEDA, CALIFORNIA

DCN: FWSD-RACII-01-0299

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

1230 Columbia Street, Suite 640
San Diego, CA 92101

Tajma Vaughns-Rachal
Geotechnical Engineer

Abid Loan
Project Manager

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ABBREVIATIONS AND ACRONYMS

CPT	Cone Penetrometer Test
ft/min	feet per minute
FWENC	Foster Wheeler Environmental Corporation
IR	Installation Restoration
mm/s	millimeters per second
NAS	Naval Air Station
OU	Operable Unit
SOP	Standard Operating Procedure
UXO	Unexploded Ordnance

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish procedures for Cone Penetrometer Test (CPT) and installations in support of characterization activities at Installation Restoration (IR) Site 1, Operable Unit 3 (OU-3) of former Naval Air Station (NAS) Alameda, Alameda Point, Alameda, California by Foster Wheeler Environmental Corporation (FWENC).

2.0 SCOPE

Soil types and strengths shall be measured by 14 Cone Penetrometer Tests if soil conditions warrant a Phase 2 evaluation to support further seismic characterization. It is anticipated that CPT soundings will be obtained to an initial depth of 50 feet. Metal avoidance procedures will be used to prevent damage to equipment.

3.0 CONE PENETROMETER TESTING

The general requirements and procedures are designed to provide consistent and representative guidance while performing cone penetrometer soundings. This section describes equipment requirements and specific procedures for cone penetrometer testing.

3.1 EQUIPMENT REQUIREMENTS

1. Field logbook and boring log forms
2. Indelible ink pens and markers
3. Camera
4. Push rods
5. Inner rods
6. Cone penetrometer
7. Measuring equipment (hydraulic or electric load cell or proving ring)
8. Thrust machine
9. Metal detector (magnetometer)
10. Assorted geology supplies (hand lens, grain-size card, scales, for example)

3.2 TYPICAL PROCEDURES

1. Conduct site activity/health and safety briefing.
2. Calibrate field instrumentation.
3. Unexploded Ordnance (UXO) Technicians will clear the work site of metal debris. After finding a location that magnetometer indicates is free of detectable metal, the drill hole will be started using a hand-held auger. At a depth of 2 feet, the magnetometer probe will be inserted into the borehole and checked for metal. This procedure will be repeated until the depth of the hand-held auger is reached, about 4 feet.
4. If clear, the thrust machine will be mobilized to the drill hole.
5. Position the cone penetrometer over the borehole and auger down to maximum depth of 8 feet. Pull the drill string and relocate the drilling rig at least 20 feet away from the borehole. The magnetometer probe will be lowered into the hole to check for metal. If clear of metal, reposition the drilling rig over the hole and commence drilling.

(This procedure will be repeated every 4 feet until a depth of 20 feet is reached, or to the first sampling depth (less than 20 feet), as determined by the on-site geotechnical engineer/geologist. If boring location is not clear of metal, drilling shall cease and new boring location will be sited and discussed.)

6. Set up the thrust machine for a thrust direction as near vertical as practical.
7. Maintain a rate of depth penetration of 2 to 4 feet per minute (ft/min) [10 to 20 millimeters per second (mm/s)] +/- 25%.
8. Advance penetrometer tip to the required test depth by applying sufficient thrust on the push rods.
9. Apply sufficient thrust on the inner rods to extend the penetrometer tip.
10. Obtain the cone resistance at a specific point during the downward movement of the inner rods relative to the stationary push rods.
11. Record only those thrust readings that occur at a well-defined point during the downward movement of the top of the inner rods relative to the inner rods (this is the point just before the cone engages the friction sleeve).
12. Repeat steps 3-11 to a maximum depth of 50 feet.
13. Decontaminate all equipment with a water rinse. If equipment is in contact with hazardous waste or refuse, use a combination of Alconox, deionized water, and alcohol rinses.
14. Document activities in the field logbook.