FOSTER WHEELER ENVIRONMENTAL CORPORATION

CONTRACT NO. N68711-98-D-5713
CTO NO. 0023

FINAL

PROJECT WORK PLAN

Revision 0
January 21, 2003

NON-TIME-CRITICAL REMOVAL ACTION
INSTALLATION RESTORATION PROGRAM SITE 73
(WATER TOWER AREA)
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1413

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EXECUTIVE SUMMARY

This Executive Summary describes the scope of a Non-Time-Critical Removal Action at Installation Restoration Program (IRP) Site 73, also referred to as the former Water Tower Area at Naval Weapons Station (NAVWPNSTA) Seal Beach, Seal Beach, California. The Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV), directs this removal action 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). The DON has determined upon review of the site's operational history and site-specific soil investigative data that this site contains elevated concentrations of lead in soil, thus requiring a response action. This decision is documented in the Draft Action Memorandum/Removal Action Plan (AM/RAP) (SWDIV, 2002). The DON has initiated a removal action for the impacted soil at IRP Site 73 to reduce any potential threats to human health and the surrounding environment. The planned removal action for the contaminated soils at IRP Site 73 is excavation and off-site disposal. Because the vertical extent of the contaminated soil appears to be limited to the upper few feet below ground surface (bgs) and groundwater is approximately 15 feet bgs (CH2M Hill, 2002), groundwater is not impacted. Therefore, this removal action focuses on soil. It is anticipated that no further action will be required at this site after implementation of the planned removal action.

The extent of IRP Site 73, which underwent investigation, consists of a rectangular area of approximately 6 acres, under and surrounding the station's water tower, located east of Seal Beach Boulevard, south of the Main Gate, and west of Building 206 (Figures 1-1, 1-2, and 1-3). This area is predominantly flat with a few mounded areas in the immediate vicinity of the water tower. The site is a grassy area, landscaped with some scattered trees and shrubs. The site falls within a known archaeological site (Archaeological Site CA-Ora-322/1118) and, in 1997, an archaeological investigation documented by Ogden Environmental and Energy Services Co., Inc., (Ogden) reconfirmed the significance of the site's cultural resources (Ogden, 1997). The extent of the contaminated soils requiring excavation at IRP Site 73 are confined to four distinct areas (A, B, C, and D as shown on Figure 2-1) with the highest lead concentrations. The approximate limits of these four excavation areas are delineated in the Final Engineering Evaluation/Cost Analysis (EE/CA) (Bechtel National, Inc. [BNI], 2002), based on the 300 milligrams per kilogram (mg/kg) lead iso-concentration lines. The largest area (A) is located at the foot of the water tower and is approximately 60 feet wide by 80 feet long. Area B is approximately 20 feet by 50 feet, and is located approximately 210 feet north from the center of the water tower and near the station perimeter fence along Seal Beach Boulevard. Area C is approximately 30 feet by 40 feet, and Area D is the smallest area and is approximately 20 feet by 30 feet.

Potable water is supplied to NAVWPNSTA Seal Beach by the City of Seal Beach. In the past, the potable water was stored in the water tower at IRP Site 73, which contains a 103,000-gallon elevated tank. Since its construction around 1944, the external surface of the water tower has been periodically sandblasted and painted. The most recent sandblasting/painting activities took place around 1994. These activities resulted in the release of sandblasted paint chips to the area under and surrounding the water tower (CH2M Hill, 2002). The aboveground portion of the water tower has been removed as of May 2002. Otherwise, the land use at the site is not anticipated to change.

The soil at IRP Site 73 is primarily silty clay with a higher silt content observed at lower depth (CH2M Hill, 2002). Groundwater is expected to be approximately 15 feet, or more, bgs (CH2M Hill, 2002).

The nature and extent of contamination at IRP Site 73 was determined based on the results of the Phase II Focused Site Inspection (FSI) summarized in the Final EE/CA prepared by BNI (BNI, 2002). Nine metals (arsenic, cadmium, copper, lead, manganese, mercury, nickel, selenium, and zinc) were reported at concentrations above the upper limit background values (ULBVs). Most of the metals concentrations above ULBVs were reported in surface soil samples. Observations of the concentration trends indicated that most of the metals (primarily lead, copper, and cadmium) attenuate with depth and that arsenic may be naturally occurring. Twenty semivolatile organic compounds (SVOCs), including 14 polynuclear aromatic hydrocarbons (PAHs) and three phthalates (common laboratory contaminants), were reported in soil samples. Most of the SVOCs were reported in surface soil samples. The 95 percent upper confidence limit (UCL) of the mean concentration of metals in soil at the site yielded an excess lifetime cancer risk (ELCR) of 2×10^{-9} and a noncancer hazard index (HI) of 0.7. The ELCR associated with SVOCs in soil was 1×10^{-5}, primarily as a result of a PAH, benzo[a]pyrene. The noncancer HI was less than 0.1 for SVOCs at IRP Site 73. These findings indicated a low risk to human health. Based on the human-health risk screening conducted as part of the Phase II FSI, the risk from SVOCs is considered low and the risk from metals is considered minimal.

Based on the ecological risk assessment conducted as part of the Phase II FSI, it was concluded that PAHs do not contribute risk to ecological receptors. However, significant risk to ecological receptors exists from metals in soil. The ecological risk assessment includes consideration of the ecological receptors that live on or otherwise use IRP Site 73 (mourning dove, ground squirrel, and American kestral) and additional ecological receptors (raccoon [mammal, omnivore], American robin [bird, omnivore], and red fox [mammal, carnivore]), plants; soil invertebrates; and soil microbes. Safe ecological Preliminary Remediation Goals (PRGs) for most receptors are exceeded by the maximum concentrations of these metals and by the 95 percent UCL of the mean concentration of lead. Lead has been determined to be the primary contributor to risk at this site. Because of the significant threats to ecological receptors at IRP Site 73, the soil contamination warrants a removal action.

In order to evaluate and recommend an appropriate response action, the DON prepared an EE/CA for IRP Site 73. The Final EE/CA (BNI, 2002) identified the removal action objectives (RAOs) and analyzed several removal action alternatives to address the soil contamination at IRP Site 73.

The RAOs for IRP Site 73 were developed based on CERCLA, the NCP, and applicable or relevant and appropriate requirements (ARARs) identified by the DON in the Final EE/CA (BNI, 2002). The RAOs for IRP Site 73 are designed to reduce further migration of sandblast paint chips in the soil at IRP Site 73, reduce risk to ecological receptors from lead-impacted soil to acceptable levels, and minimize potential impact to cultural resources at IRP Site 73 to the extent practicable. To help meet these RAOs, a site-specific target cleanup goal (TCG) was established for the areas where the removal actions would occur.

Based on the ecological risk assessment and subsequent discussions with the regulatory agencies, the recommended TCG for lead in soil is 317 mg/kg. This value is considered protective of wildlife that may be present at the site, such as small birds and mammals, and protective of soil invertebrates and microbes that represent a source of food for the small birds and mammals.

The removal action recommended for implementation by the DON for the contaminated soils at IRP Site 73 and presented in the Final EE/CA (BNI, 2002) is data recovery followed by mechanical excavation with monitoring by an archaeological monitor and a Native American monitor, and off-site disposal. This alternative consists of excavating, transporting, and disposing of contaminated soil off site and backfilling the excavated areas with clean imported fill. In conjunction with the removal action, an archaeological data recovery will be conducted in accordance with the Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118 approved by the State Historical Preservation Office (SHPO). Because of the potential archaeological significance of the site, an archaeological monitor and a Native American monitor will be present at the site to monitor the excavation. The excavation and off-site disposal alternative would reduce the risk posed by IRP Site 73.

Prior to soil excavation, a geophysical survey will be performed to assist in locating and marking any underground utilities or features and to provide utility clearance. A land survey will also be performed to assist in establishing the existing grade and marking the estimated limits of excavation.

The excavation of the contaminated soils will commence following the removal of the water tower footings. The areas for excavation ~~will be based~~ on the TCG. The vast majority of the contaminated soil is limited to the upper 1.5 feet of soil. The maximum depth of the excavation is expected to be 3 feet.

After excavating, verification samples will be collected from the floor and sidewalls of the excavations to ensure that the removal action satisfies the TCGs. All soil with lead concentrations of 317 mg/kg or higher will be further excavated. The area in question will then be re-sampled, and the process will continue until the TCG is achieved. The in-place volume of soil to be excavated is estimated to be 400 cubic yards or 500 loose cubic yards of soil (assuming a 25 percent swell factor).

Excavated material will be stockpiled on site. The stockpiled soil will be sampled for waste classification purposes. Soil and debris classified as Resource Conservation and Recovery Act (RCRA) hazardous waste will be transported to a CERCLA-approved and appropriately permitted hazardous waste landfill facility for treatment, if necessary, and disposal. Soil and debris classified as non-RCRA California hazardous waste will be transported to a CERCLA-approved and appropriately permitted landfill facility for disposal.

Contaminated soil will be loaded into trucks for transportation to an off-site disposal facility. Loaded trucks will be weighed to ensure compliance with Department of Transportation (DOT) regulations. A hazardous waste manifest will be filled out for each load and provided to the transporter for shipment.

The excavated areas will be backfilled using clean fill (soil that does not contain chemical compounds with concentrations that are above the upper limit background value established for NAVWPNSTA Seal Beach) material obtained locally from an off-site source(s). All imported fill material will be certified as free of any contaminants prior to delivery to the site. The fill material will be placed in the excavation areas in 12-inch compacted lifts. The backfill material will be placed and compacted to 90 percent of the maximum dry density as measured by the Modified Proctor Test (American Society for Testing and Materials [ASTM] D 1557). A minimum of two in-place density tests will be performed for each lift. The final 6 inches of backfill will not be compacted, but will be graded for site restoration.

After the excavation has been backfilled to the original grade, the area will be restored to a condition consistent with its surrounding. Six inches of topsoil will be placed over the backfilled areas, and all disturbed surfaces will be covered with sod.

The results of the removal action will be documented in a Removal Closeout Report and presented to the DON, the responsible regulatory agencies, and the Restoration Advisory Board (RAB).

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ABBREVIATIONS AND ACRONYMS

AM/RAP	Action Memorandum/Removal Action Plan
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
bgs	below ground surface
BNI	Bechtel National, Inc.
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
CQC	Contractor Quality Control
DHS	Department of Health Services
DON	Department of the Navy
DOT	Department of Transportation
DPM	Deputy Program Manager
DTSC	Department of Toxic Substances Control
EE/CA	Engineering Evaluation/Cost Analysis
ELCR	excess lifetime cancer risk
EMI	electromagnetic instrument
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
FSI	Focused Site Inspection
FWENC	Foster Wheeler Environmental Corporation
GPR	ground-penetrating radar
HI	hazard index
HQ	hazard quotient
IR	Installation Restoration
IRP	Installation Restoration Program
LDR	Land Disposal Restriction
mg/kg	milligrams per kilogram
NAVWPNSTA	Naval Weapons Station

ABBREVIATIONS AND ACRONYMS
(Continued)

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NISZ	Newport-Inglewood structural zone
NHPA	National Historic Preservation Act
NTCRA	Non-Time-Critical Removal Action
Ogden	Ogden Environmental and Energy Services Co., Inc.
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
PPE	personal protective equipment
PRG	Preliminary Remediation Goal
QC	Quality Control
RAB	Restoration Advisory Board
RAO	Removal Action Objective
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SBNWR	Seal Beach National Wildlife Refuge
SCAQMD	South Coast Air Quality Management District
SCS	Soil Conservation Service
SHPO	State Historical Preservation Office
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
STLC	Soluble Threshold Limit Concentration
SVOC	semivolatile organic compound
SWDIV	Southwest Division Naval Facilities Engineering Command
TCG	target cleanup goal
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	treatment, storage, and disposal facility
TTLC	Total Threshold Limit Concentration

ABBREVIATIONS AND ACRONYMS
(Continued)

UCL	upper confidence limit
ULBV	upper limit background value
WET	Waste Extraction Test
Work Plan	Project Work Plan

1.0 INTRODUCTION

This Project Work Plan (Work Plan) describes the scope of a Non-Time-Critical Removal Action (NTCRA) at Installation Restoration Program (IRP) Site 73, former Water Tower Area, at Naval Weapons Station (NAVWPNSTA) Seal Beach, Seal Beach, California (Figures 1-1, 1-2, and 1-3). The Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV), directs this removal action 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). The DON has determined upon review of the site's operational history and site-specific soil investigative data that this site contains elevated concentrations of lead in soil requiring a response action. The DON has initiated the removal action for the impacted soil at IRP Site 73 to reduce any potential threats to human health and the surrounding environment. Accordingly, the DON has developed an Action Memorandum/Removal Action Plan (AM/RAP) (SWDIV, 2002), which documents for the Administrative Record, the DON's decision to undertake a NTCRA for soils containing elevated levels of lead at the subject site.

The Work Plan describes the scope of the NTCRA at IRP Site 73 at NAVWPNSTA Seal Beach and provides detailed descriptions of the specific activities involved in the implementation of the planned removal action. It is anticipated that no further action will be required at this site after implementation of the planned removal action.

The scope of the planned removal action consists of three work elements, which must be accomplished to complete removal of the impacted soil at this site. These work elements can be generally identified as:

- Work Element 1: Work Plan Development
- Work Element 2: Removal Action Implementation
- Work Element 3: Site Closeout

This Work Plan completes the requirements under Work Element 1. The Work Plan was prepared based on the recommendations presented in the Final Engineering Evaluation and Cost Analysis (EE/CA) for IRP Site 73 prepared by Bechtel National, Inc. (BNI) (BNI, 2002) and includes a review of background information to understand the nature and extent of contamination present at the site. To assist in any soil removal (excavation) planning, the preliminary limits of the impacted soils are estimated based on the information presented in the Final EE/CA (BNI, 2002). The project management plan, a construction schedule, and an Environmental Protection Plan (EPP) are included as a part of this Work Plan. The Work Plan is supported by additional project-specific documents that will be referenced as appropriate to provide further detail. These additional documents include a Sampling and Analysis Plan (SAP)

for chemical data acquisition (Appendix A), a Project Contractor Quality Control (CQC) Plan (Appendix B), and Memorandum of Agreement between the DON and the California State Historical Preservation Officer (SHPO) regarding IRP Site 73 Soil Removal Project, NAVWPNSTA Seal Beach, Orange County, California (Appendix C), which includes an Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118 as Attachment A.

Following approval of the Work Plan by the DON and the regulatory agencies, Foster Wheeler Environmental Corporation (FWENC) will proceed with Work Element 2. The implementation measures and procedures described in the Work Plan will be followed closely to assure compliance with the applicable design criteria, removal action objectives (RAOs), and regulatory requirements. A number of pre-construction activities, such as notifications and procurement, will be performed as a part of field implementation planning. Subsequently, the field personnel and equipment will be mobilized to the site, and the removal activities will begin. The major activities include removal of the approximately first 3 feet of the water tower footings, excavation, stockpiling, verification and stockpile soil sampling and analyses, waste classification, transportation and off-site disposal of the impacted soil, backfilling and compaction, and site restoration. Work Element 2 activities will be completed upon decontamination and demobilization of all equipment and personnel.

Site closeout activities will be performed under Work Element 3 at completion of the removal action. These activities will include both technical and administrative closeout of the removal action. For technical closeout, a Removal Closeout Report will be prepared to contain the necessary information to demonstrate that the appropriate fieldwork has been completed to meet the RAOs. The Pre-Draft Removal Closeout Report will be submitted to the DON for review and comments. The DON comments will be incorporated into a Draft Removal Closeout Report that will be presented to the regulatory agencies and the Restoration Advisory Board (RAB) for review and comments. The Final Removal Closeout Report will be issued after the regulatory and RAB comments are addressed. The Final Removal Closeout Report will comply with all applicable regulatory guidelines and will be signed by a state of California Registered Civil Engineer.

The Work Plan has been structured to provide details on the major aspects of the planned removal action. The remainder of this Work Plan is divided into eight sections. Section 2.0 provides an assessment of the impacts including discussions on the physical, geologic, and chemical characteristics of the site. The regulatory framework and the target cleanup goal (TCGs) determination for the site contaminants are presented in Section 3.0. Section 4.0 provides a detailed description of the different tasks associated with the removal action implementation. The EPP is included as Section 5.0. The Project Management Plan, including the project schedule, is discussed in Section 6.0. Section 7.0 describes the community relations activities to be implemented during the course of this project. References are included in Section 8.0.

2.0 SITE CONDITIONS

Pertinent information on geology, hydrology, the nature and extent of contamination, and the health risk evaluation are presented in this section.

2.1 SITE DESCRIPTION AND HISTORY

NAVWPNSTA Seal Beach, consists of approximately 5,000 acres of land along the Pacific Coast, within the city of Seal Beach in Orange County, California (Figures 1-1 and 1-2). NAVWPNSTA Seal Beach is bordered on the southwest by Anaheim Bay, on the north by Interstate 405 (San Diego Freeway), on the east by Bolsa Chica Road, on the west by Seal Beach Boulevard, and on the southeast by an Orange County flood control channel. NAVWPNSTA Seal Beach was originally commissioned in 1944. NAVWPNSTA Seal Beach is part of the Commander Navy Region Southwest, and its major claimant is the Commander-In-Chief United States Pacific Fleet. The station provides fleet combatants with ready-for-use ordnance. Because of its geographic location, the station serves as a supply point for the operating forces of the DON and United States Marine Corps in the southern California region.

The extent of IRP Site 73, which underwent investigation, consists of a rectangular area, approximately 6 acres, under and surrounding the station's water tower, located east of Seal Beach Boulevard, south of the Main Gate, and west of Building 206 (Figure 1-3). The site is within the southwestern quarter of Section 12, Township 5 South, Range 12 West of San Bernardino Meridian. The latitude and longitude of IRP Site 73 are 33°44'52" north and 118°05'20" west, respectively (United States Geological Survey, 1965). This area is predominantly flat with a few mounded areas in the immediate vicinity of the water tower. The site is a grassy area, landscaped with some scattered trees and shrubs. The site falls within a known archaeological site (Archaeological Site CA-ORA-322/1118). In 1997, an archaeological investigation, documented by Ogden Environmental and Energy Services Co., Inc. (Ogden), reconfirmed the significance of the site's cultural resources (Ogden, 1997). The extent of contaminated soils requiring excavation at IRP Site 73 are confined to four distinct areas with the highest lead concentrations. These areas are identified as Areas A, B, C, and D and are shown on Figure 2-1. The approximate limits of these four excavation areas are delineated in the Final EE/CA (BNI, 2002), based on the 300 milligrams per kilograms (mg/kg) lead iso-concentration lines. The largest area (A) is located at the foot of the water tower and is approximately 60 feet wide by 80 feet long. Area B is approximately 20 feet by 50 feet, and is located approximately 210 feet north from the center of the water tower and near the station perimeter fence along Seal Beach Boulevard. Area C is approximately 30 feet by 40 feet and Area D is the smallest area and is approximately 20 feet by 30 feet.

Potable water is supplied to NAVWPNSTA Seal Beach by the City of Seal Beach. In the past, the potable water was stored in the water tower at IRP Site 73, which contains a 103,000-gallon elevated tank. Since its construction around 1944, the external surface of the water tower has been periodically sandblasted and painted. The most recent sandblasting/painting activities took place around 1994. These activities resulted in the release of sandblasted paint chips to the area under and surrounding the water tower (CH2M Hill, 2002). The aboveground portion of the water tower has been removed.

2.2 PHYSICAL CHARACTERISTICS

2.2.1 Geologic Setting

Most of NAVWPNSTA Seal Beach lies on flat, alluvial deposits that slope evenly from approximately 20 feet above mean sea level in the northeastern part of the facility to mean sea level in the tidal flats in the southwestern portion of the base.

Bedrock in the vicinity of the base is a thick sequence of Tertiary and Quaternary sedimentary rocks deposited on a basement of pre-Tertiary metamorphic and crystalline rocks. Tertiary rocks range in age from Oligocene to Pliocene and include sandstone, siltstone, shale, and mudstone; they are almost exclusively of marine origin (CH2M Hill, 2002).

NAVWPNSTA Seal Beach is located adjacent to the Pacific Ocean at the seaward edge of the Orange County Coastal Plain, in the northwest corner of Orange County, California. The northwest-trending, Newport-Inglewood structural zone (NISZ) underlies the southwestern half of NAVWPNSTA Seal Beach. NISZ consists of a complex set of faults and folds that extend from Newport Beach, approximately 10 miles southeast of NAVWPNSTA Seal Beach, to Beverly Hills at the base of the Santa Monica Mountains, approximately 30 miles northwest of the station. Uplift along the NISZ has produced a line of low coastal hills and mesas near the southern end, including Landing Hill along the western edge of NAVWPNSTA Seal Beach. Adjacent to Landing Hill on the east is Sunset Gap, a wetlands comprising coastal salt marsh and tidal mudflats (BNI, 2000).

NAVWPNSTA Seal Beach soils typically contain abundant clay and silt and are poorly drained. Six soil types (Alo clay, Beaches, Bolsa silt loam, Bolsa silt clay loam, Myford sandy loam, and tidal flats) have been identified at the station (Soil Conservation Service [SCS], 1978). The soil at IRP Site 73 is primarily silty clay with a higher silt content observed at lower depth (CH2M Hill, 2002). Groundwater is expected to be approximately 15 feet or more below ground surface (bgs) (CH2M Hill, 2002).

2.3 CHEMICAL CHARACTERISTICS

The nature and extent of contamination at IRP Site 73 are based on the results of the Phase II Focused Site Inspection (FSI) (CH2M Hill, 2002) and are summarized in the Final EE/CA (BNI,

2002). The objectives of the Phase II FSI were to determine the extent of metals and semivolatile organic compounds (SVOCs) and to screen for ecological and human health risks. This section presents the chemicals of concern (COCs) identified, based on the Phase II FSI, and provides an estimate of the quantity of impacted soil.

2.3.1 Chemicals of Concern

Nine metals (arsenic, cadmium, copper, lead, manganese, mercury, nickel, selenium, and zinc) were reported at concentrations above the upper limit background values (ULBVs). Most of the metals concentrations above ULBVs were reported in surface soil samples. Observations of the concentration trends indicated that most of the metals (primarily lead, copper, and cadmium) attenuate with depth and that arsenic may be naturally occurring.

Twenty SVOCs, including 14 polynuclear aromatic hydrocarbons (PAHs) and three phthalates (common laboratory contaminants), were reported in soil samples. Most of the SVOCs were reported in surface soil samples.

Based on the human health risk screening, the risk from SVOCs is considered minimal, and the risk from metals is considered acceptable.

Based on the ecological risk screening, it was concluded that PAHs do not contribute to risk to ecological receptors. However, significant risk to terrestrial receptors exists from metals in soil. Safe ecological Preliminary Remediation Goals (PRGs) for most receptors are exceeded by the maximum concentrations of these metals and by the 95 percent upper confidence limit (UCL) of the mean concentration of lead. Lead is the primary contributor to risk at this site.

2.3.2 Concentrations and Extent of the Contaminated Soil

Contamination at IRP Site 73 is associated with several sandblasting and repainting events that occurred at the station's water tower. From these events, lead-bearing paint residue was deposited on the ground. The extent of lead in soil at IRP Site 73, based on analytical results from the Phase II FSI, is shown on Figures 2-1 and 2-2. Figure 2-1 shows the lateral extent of lead in surface soil (based on soil samples collected from 0.5 to 1.0 foot bgs), and Figure 2-2 shows the lateral extent of lead in subsurface soil (based on soil samples collected from 2.0 to 2.5 feet bgs). Combined, these two figures provide an approximation of the vertical extent of lead in soil and illustrate that most of the elevated lead concentrations were reported in surface soil samples. The figures show that lead concentrations exceeding the station-wide ULBV of 35.7 mg/kg and ranging up to 100 mg/kg are widespread throughout the approximately 6-acre investigation area. However, once the concentrations begin to exceed the 100-mg/kg concentration level, the lateral extent is greatly reduced. Another sharp reduction in the lateral extent can be observed for lead concentrations above 400 mg/kg, which are localized in two relatively small areas. One of the localized areas with lead concentrations is very close to the

water tower while the other is adjacent to Seal Beach Boulevard. It was theorized in the Phase II FSI that, in addition to lead contamination from water tower painting/sandblasting activities, lead deposited from atmospheric pollution due to the close proximity of Seal Beach Boulevard to the site may have also contributed to the values exceeding background levels.

The estimated in-place volume of contaminated soil with lead concentrations above the TCG is approximately 400 cubic yards.

2.4 RISK EVALUATION

Human health and ecological risk screening for soils at IRP Site 73 was performed as part of the Phase II FSI (CH2M Hill, 2002). The chemicals of potential concern (COPCs) that were evaluated were metals and SVOCs.

During the human health risk screening, soil analytical data were compared with station-wide ULBVs and residential PRGs. The excess lifetime cancer risk (ELCR) and noncancer hazard quotient (HQ) for each COPC were then estimated. The 95 percent UCL of the mean concentration of metals in soil at the site yielded an ELCR of 2×10^{-9} and a noncancer hazard index (HI) of 0.7. The ELCR associated with SVOCs in soil was 1×10^{-5}, primarily as a result of the PAH, benzo[a]pyrene. The noncancer HI was less than 0.1 for SVOCs at IRP Site 73. These findings indicated a low risk to human health.

An ecological risk assessment was performed for contaminants present in soil at IRP Site 73 (CH2M Hill, 2002). The ecological risk assessment includes consideration of the ecological receptors that live on or otherwise use IRP Site 73 (mourning dove, ground squirrel, and American kestral) and additional ecological receptors (raccoon [mammal, omnivore], American robin [bird, omnivore], and red fox [mammal, carnivore]), plants; soil invertebrates; and soil microbes. Although the red fox was relocated to an off-station location several years ago, it was used in the refined ecological risk assessment to represent mammalian carnivore species. The addition of supplemental ecological receptors provided for a broader evaluation of the ecosystem that may be at the site. The risk assessment indicated that lead in soil presents an unacceptable ecological risk.

Conditions at the site meet the following NCP requirement for a removal action [40 Code of Federal Regulations (CFR), Part 300.415(b)(2)].

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

3.0 REGULATORY FRAMEWORK

The primary objective of the proposed removal action is to protect human health and the environment. RAOs and TCGs were developed to provide objectives used to define and evaluate removal action alternatives. Potential applicable or relevant and appropriate requirements (ARARs) were identified and evaluated to assist in determining RAOs and recommended TCGs.

3.1 REGULATORY PROCESS

This removal action will be conducted pursuant to the CERCLA and the NCP under the delegated authority of the Office of the President of the United States by Executive Order 12580. This order provides the DON with authorization to conduct and finance removal actions. The DON, with state regulatory oversight, is the lead agency for the removal action. The California Department of Toxic Substances Control (DTSC) and Regional Water Quality Control Board (RWQCB), Santa Ana Region, provides state oversight. The DON conducted public participation and received agency concurrence during the development of the Final EE/CA (BNI, 2002) and AM/RAP (SWDIV, 2002).

This removal action is non-time-critical and can be implemented later than 6 months after the determination that a response is necessary. In order to recommend a proper response, and in accordance with Section 300.415(b) of the NCP, the DON has already prepared an Final EE/CA for IRP Site 73. The Final EE/CA (BNI, 2002) has been prepared by BNI and was issued to the regulatory agencies in March 2002. The recommended removal action consists of excavation and off-site disposal of the impacted soils. The regulatory agencies have concurred with the Final EE/CA (BNI, 2002) and the DON issued a Draft Action Memorandum summarizing the results of the Final EE/CA (BNI, 2002) on April 13, 2002. Both the Final EE/CA (BNI, 2002) and Action Memorandum for IRP Site 73 will be part of the Administrative Record file and will be subject to the public comment.

Upon regulatory concurrence of the Action Memorandum and the public notification and comment period of the removal action, the planned removal action will be implemented. The removal action and site restoration activities for IRP Site 73 are expected to be completed within 2 months after approval of the proposed removal action. At completion of the removal action, site closeout will proceed with the preparation of the Removal Action Closeout Report.

3.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The NCP requires on-site CERCLA removal actions to identify and comply with federal and state ARARs to the extent feasible, considering the urgency of the situation. In accordance with the NCP requirements, the ARARs for the planned removal action at IRP Site 73 have been identified and documented in the Final EE/CA (BNI, 2002).

Several chemical-specific, location-specific, and action-specific ARARs were identified that affected the development of RAOs and TCGs for the site. The primary ARARs for this removal action include the federal and state hazardous waste management regulations. Based on the knowledge of the nature and concentrations of contaminants at IRP Site 73, the impacted soil will not be considered a listed hazardous waste and will not be ignitable, corrosive, or reactive. Concentrations of the COCs in some soil samples, however, indicate that the soil may be classified as toxic and, therefore, possibly a Resource Conservation and Recovery Act (RCRA) hazardous waste. A RCRA classification determination must be made using the Toxicity Characteristic Leaching Procedure (TCLP).

California environmental health standards for the management of hazardous waste were approved by the U.S. Environmental Protection Agency (EPA) as a component of the federally authorized California RCRA program. Therefore, soils excavated from IRP Site 73 must be evaluated for hazardous waste characteristics based on the Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC). Soil not classified as a RCRA hazardous waste may be classified as a non-RCRA California hazardous waste. Both the TCLP and California Waste Extraction Test (WET) may be used to classify the soil at this site. Soil not classified as RCRA hazardous or non-RCRA hazardous is classified as non-hazardous.

Excavation activities must be performed in accordance with certain regulatory requirements. Fugitive dust emissions are expected from the soil excavation and stockpiling operations during the removal action. Substantive state requirements of South Coast Air Quality Management District (SCAQMD) Rules 401(b)(1)(A), 403, 404, and 405 for fugitive dust emissions were identified as ARARs.

In addition, the substantive provisions of the following requirements were identified as ARARs for the development of the RAO for IRP Site 73:

- National Historic Preservation Act (NHPA)
- Archaeological and Historic Preservation Act
- Archaeological Resources Protection Act
- California Fish and Game Code Section 3005(a) regarding the taking of birds and mammals

3.3 SOIL TARGET CLEANUP GOALS

Based on CERCLA, the NCP, the risk assessment in the Phase II FSI (CH2M Hill, 2002), and ARARs, the RAOs are as follows:

- Minimize further migration of sandblasted paint chips in the soil at IRP Site 73
- Reduce risk to ecological receptors from lead-impacted soil to acceptable levels

- Minimize potential impact to cultural resources at IRP Site 73 to the extent practicable

Based on the ecological risk assessment and subsequent discussions with the regulatory agencies, the recommended TCG for lead in soil is 317 mg/kg. This value is considered protective of wildlife that may be present at the site, such as small birds and mammals, and protective of soil invertebrates and microbes that represent a source of food for the small birds and mammals.

3.4 PUBLIC INVOLVEMENT

The DON, as lead agency with state agency concurrence, has overall responsibility for public participation activities. As such, this document, the Final EE/CA prepared by BNI (BNI, 2002), as well as other information concerning IRP Site 73 is available to the public via the Information Repository located in the Mary Wilson Branch of Seal Beach Public Library. This branch of the library is located at 707 Electric Avenue, Seal Beach, California. The Administrative Record Index is maintained by SWDIV and is available to the public at the SWDIV offices in San Diego, California.

4.0 PLANNED REMOVAL ACTIVITIES

This section describes the specific activities and procedures involved in preparation for, and field implementation of, the planned removal action at IRP Site 73. The preparatory activities include subcontracting/procurement, permitting, notifying the responsible agencies, and a kickoff meeting with the DON project personnel. As part of the preparatory activities, a geophysical survey also will be performed in the identified area of excavation. Subsequently, the required equipment, personnel, and material will be mobilized to the site, and the removal activities will begin. Upon completion of the removal activities, all excavated soil and the liquid/solid waste generated during the field activities will be disposed of in an appropriate manner. The site surface conditions will then be restored to the extent feasible, and all equipment and personnel will be demobilized from the site.

4.1 SUBCONTRACTING/PROCUREMENT

All field activities will be performed under the direct supervision of FWENC with assistance from several specialty subcontractors. The procurement of appropriate subcontractors and required services and materials will be performed in a manner consistent with the terms of the contract and applicable Federal Acquisition Regulations.

Prior to the field removal activities, a geophysical surveyor and a land surveyor will be retained. The geophysical surveyor will assist in locating and marking any underground utilities or features and to provide utility clearance. The land surveyor will assist in establishing the existing grade and marking the estimated limits of excavation.

Specialty subcontractors will be procured to assist in the specific aspects of the removal activities. These subcontractors include a hazardous waste hauler/transporter, a treatment, storage, and disposal facility (TSDF), and an analytical laboratory. The hazardous waste hauler/transporter will transport the impacted soil from IRP Site 73 at NAVWPNSTA Seal Beach to the identified regulatory-approved TSDF. The analytical laboratory will perform the required chemical analysis on the soil samples during waste characterization and verification sampling. The laboratory also will perform liquid analyses on any wastewater (decontamination water) that may be generated during the removal action. Actual soil removal activities will be performed by FWENC.

Other subcontracting services will be used to provide waste containers, a vacuum truck, and wastewater treatment. Waste containers include 55-gallon drums for storage of decontamination wastewater and roll-off bins for storage of trash/solid waste and used polyethylene liners/personal protective clothing. Vacuum truck services may be used to transport the decontamination water to an off-site CERCLA-approved wastewater treatment facility.

Vendor procurement will involve leasing an office trailer, portable toilets, and health and safety monitoring equipment. Other miscellaneous equipment such as sampling and testing equipment, construction tools, polyethylene liners, sandbags, and so forth, will be procured on an as-needed basis.

A fencing subcontractor will be retained for installing the necessary security fencing and gates around the site.

4.2 PERMITTING AND NOTIFICATIONS

FWENC will obtain all necessary authorizations from NAVWPNSTA Seal Beach for completing the planned removal action at IRP Site 73. Prior to the field activities, FWENC will notify the DON Remedial Project Manager (RPM), Resident Officer in Charge of Construction (ROICC), and the appropriate NAVWPNSTA department personnel about the nature of the anticipated work. Underground Service Alert will also be notified to obtain utility clearance prior to excavation activities.

4.3 PREPARATORY ACTIVITIES

At least 2 weeks prior to the start of the field activities at IRP Site 73, a kickoff meeting will be held between the DON and FWENC. The purpose of this meeting is to develop a mutual understanding of the removal activities and the CQC details, including forms to be used, administration of on-site work, and coordination of the construction management and production. FWENC will prepare minutes of the meeting for submittal to the DON. The following DON representatives will be requested to attend: RPM, ROICC, NAVWPNSTA Installation Restoration (IR) Program Manager, and representatives from NAVWPNSTA Emergency/Fire Department. FWENC representatives will include the Project Manager, Project Superintendent, Project Quality Control (QC) Manager, and Site Health and Safety Specialist (SHSS).

Prior to the field removal activities, a geophysical survey will be performed. The geophysical survey will be conducted using ground-penetrating radar (GPR) and/or an electromagnetic instrument (EMI). The GPR and EM will produce an image of the subsurface conditions identifying discontinuities in the soil column. These discontinuities can be identified as non-native objects such as metallic pipes or debris. The results of the geophysical survey will be compared to the available as-built drawings to determine if any undocumented utilities or other features exist in the survey area. Appropriately colored paints will be used to mark the identified utilities within the vicinity of the proposed excavation areas.

4.4 ARCHAEOLOGICAL DATA RECOVERY AND MONITORING

An archaeological data recovery will be conducted prior to any excavation activities at IRP Site 73. The purpose of data recovery associated with the IRP Site 73 removal action is to mitigate the

"adverse effect" of the undertaking as defined by Section 106 of the NHPA to a "no adverse effect". Data recovery will include fieldwork, laboratory and data analysis, and report preparation.

Under federal regulations, this type of action is considered to have a potentially adverse affect on the archaeological site. However, data recovery is considered standard and acceptable mitigation for the potential impact to the archaeological site. An Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118 has been developed and is included as Attachment A to the Memorandum of Agreement between the DON and the California SHPO in Appendix C. Following the completion of the data recovery field work, a Final Data Recovery Report will be issued containing the information obtained during the data. Following data recovery, mechanical excavation will be conducted under the surveillance of an archaeological monitor and Native American monitor; observations made during monitoring will be included in the Final Data Recovery Report. The inclusion of data recovery will help contribute to scientific understanding and enhance public appreciation and awareness of the cultural resources at the site.

Data recovery will include the excavation of a scientifically valid sample (approximately 1 percent or as approved by the SHPO of the archaeological site within the area of potential effects). The data recovery excavation will be performed by an archaeologist, using manual methods which meet the federal professional standards. If required by the SHPO a Native American monitor will be present at the site during the data recovery activities. Field work will be conducted in two stages, including a systematic auger testing to determine areas of potential effects with the most archaeological data potential followed by the excavation of approximately eight 1 by 1 meter units. From these units, archaeologists will obtain stone, bone, and shell artifacts, waste shell and animal bones, column samples, soil samples, and radiocarbon samples. Archaeological features and soil profiles will be photographed, sketched, and sampled.

The data recovery will also include wet screening of the sample soils through a 1/8-inch mesh screen. This work will be performed in the field if the facilities are available; otherwise, the soil samples will be transported to the laboratory for wet screening. All screen residue will be saved and labeled for sorting in the laboratory.

In addition, the collected material will be handled and analyzed as specified and described in the Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118 (Attachment A of Appendix C).

Following the completion of the data recovery field activities, a Final Data Recovery Report will be prepared following the format specified in Attachment A of Appendix C and submitted to the SHPO. The Final Data Recovery Report will include the following:

- Description of field and laboratory methods used
- Description of field and laboratory results, including data presented in tables and graphs

- Discussion and interpretations developed from field results and laboratory results and analysis (interpretations will be made from the results and analysis and how these data contribute to questions posed in the research design)

A summary will be provided in the report describing how the work conducted with the data recovery mitigates the "adverse effect" of the undertaking to a "no adverse effect".

After data recovery excavations have been completed and during the soil removal effort, an archaeological monitor and Native American monitor will be present onsite to watch for any significant artifacts or human remains that might be exposed. Artifacts will be collected when encountered without interruption of the soil removal effort. If human remains are encountered, however, all work in the vicinity of the find will be halted and the county coroner will be contacted to determine jurisdiction over the find. If the remains prove to be Native American, the DON will follow stipulations of the Native American Graves protection and Repatriation Act to determine handling and disposition of the remains. Once a decision has been made regarding disposition and the remains have been appropriately removed, work may again proceed.

4.5 MOBILIZATION

Mobilization activities include site preparation, movement of equipment and materials to the site, as well as training and site orientation of field personnel. At least 2 weeks prior to mobilization, the appropriate DON personnel, including the RPM and the NAVWPNSTA IR Program Manager, will be notified about the planned schedule for mobilization and the soil removal activities. A list of the field personnel and their respective certification records and personal data will be delivered to the DON to arrange for authorized entry and badges. In order to obtain station decals for site vehicles, a list of the vehicles, along with the required documentation including insurance records, will be provided to the DON.

Upon receipt of appropriate records and authorizations, the field personnel and temporary facilities will be mobilized to the site. Mobilization of temporary facilities will involve the establishment of a suitable staging area to support the project activities. The support facilities to be installed in the staging area will include an office trailer (if necessary), restroom facilities, equipment decontamination pad, and waste stockpile area. The support facilities will be located in an area determined by the appropriate NAVWPNSTA Seal Beach representative. Once support facilities are transferred to the site, utility connections will be furnished for power, water, and communications. Figure 4-1 shows a proposed layout of the site including laydown area, stockpile area, security fence, and ingress and egress at the site.

Equipment mobilization will be initiated with site preparation activities. In order to minimize storage requirements, equipment and materials will be mobilized to the site on an as-needed basis. A dedicated laydown area will be utilized for short-term storage of equipment and

materials. If needed, a secure storage trailer will be mobilized to the site for short- and long-term storage of materials required for the project.

All construction equipment will be delivered to the site in a clean condition. All equipment will be decontaminated prior to leaving the exclusion zone. Equipment decontamination records will be maintained for each piece of equipment. Decontamination procedures are presented in the Site-Specific Health and Safety Plan (SHSP).

4.6 EQUIPMENT DECONTAMINATION

All equipment that has come into contact with contaminated soil will be brush cleaned before leaving the site. Special attention will be paid to removal of material on and within the bucket and undercarriage of the excavator. Prior to removal from site, all decontaminated equipment will be inspected by the SHSS and the Project Superintendent. These individuals will document in the project record whether decontamination has been performed.

4.7 EXCAVATION

Soil data provided as part of the Phase II FSI (CH2M Hill, 2002) investigations indicate that the extent of contaminated soils requiring excavation at IRP Site 73 are confined to four distinct areas with the highest lead concentrations extending 1 to 2.5 feet deep. The approximate limits of these four excavation areas are delineated in Figures 2-1 and 2-2. The largest area (Area A) is located at the foot of the water tower and is approximately 60 feet wide by 80 feet long. Area B is approximately 20 feet by 50 feet, and is located approximately 210 feet north from the center of the water tower and near the station perimeter fence along Seal Beach Boulevard. Area C is approximately 30 feet by 40 feet and Area D is the smallest area and is approximately 20 feet by 30 feet. The vast majority of the contaminated soil is limited to the upper 1.5 feet of soil. The maximum depth of the excavation is expected to be approximately 3 feet bgs. The in-place volume of soil to be excavated is approximately 400 cubic yards or 500 loose cubic yards of soil (assuming a 25 percent swell factor). Refer to Figure 4-1 for the approximate extent of the excavation. Certain grids will be excavated to a depth of approximately 1.5 feet; other grids will be excavated to a depth of approximately 3 feet. Refer to Figure 4-1 for grid orientation.

Although the water tower has been removed, the tower footings will still be in place. Therefore, as a part of the field activities, the top 3 feet of the tower footings will be removed. Soil surrounding the footings will be removed to expose the footings. The exposed portion of the footings will be broken up using a pneumatic hammer or excavator with a breaker attachment and then removed and disposed.

The excavated soil will be stockpiled on site. Additional excavation may be necessary depending on the verification sampling results. Verification sampling is described in Section 4.8. Following the completion of the excavation and verification sampling, the excavation will be backfilled with clean imported soil (soil that does not contain chemical compounds with concentrations

above the upper limit background volume established for NAVWPNSTA Seal Beach) to original grade, and the site will be re-vegetated with grass.

Adherence to Occupational Safety and Health Administration (OSHA) excavation regulations and permit requirements will be followed. All excavations will be conducted in accordance with the substantive requirements in California Health and Safety Code, California Code of Regulations (CCR) Title 8, Sections 1539 through 1541, and 29 CFR, Parts 1910 and 1926, requirements.

An archaeological monitor and a Native American monitor will be present during all intrusive activities to monitor for cultural resources.

4.7.1 Soil Stockpiling

The excavated soils will be stockpiled on site. The stockpile area will be covered with a 20-mil polyethylene liner and bermed with clean soil or sandbags to prevent surface water runoff from coming into contact with the contaminated stockpiled soil. The stockpiled material will be covered with 6-mil polyethylene liner until final waste classification is made for off-site disposal.

4.7.2 Stockpile Sampling

One composite sample will be collected from approximately each 125 loose cubic yards of excavated soil. This sampling frequency will yield approximately four stockpile samples. The sample locations will be determined using random number generation and samples will be collected as described in the SAP. The samples will be analyzed for Title 22 metals.

Each sample will be collected by a disposable scoop and transferred directly into an 8-ounce pre-cleaned glass sample jar.

Soil will be classified as follows:

- Soil, which is less than or greater than the TCG for lead and does not exceed TTLC, STLC, or TCLP values, will be classified as non-hazardous waste.
- Soil that exceeds TTLC values for any analyte will be designated as non-RCRA California hazardous waste. However, TCLP analysis will be performed to determine if the waste is a RCRA hazardous waste.
- Soil with TTLC values of any analyte greater than or equal to 10 times the respective STLC value, but less than or equal to 20 times the TCLP value, will be designated as a potentially non-RCRA California hazardous waste. The sample will then be subjected to WET analysis. If the concentration of the analyte exceeds the analyte's respective STLC value, the soil will be classified as a non-RCRA California hazardous waste.
- Soil with TTLC values of any analyte greater than or equal to 20 times the respective TCLP value will be designated as a potentially RCRA hazardous waste. The sample

will then be subjected to TCLP analysis. If the concentration of the analyte exceeds the analyte's respective TCLP value, then soil will be classified as a RCRA hazardous waste.

4.8 VERIFICATION SAMPLING

After the excavation is complete, verification sampling will be performed. The floor of the excavations will be divided into a 10-foot-by-10-foot grid pattern. The sidewalls will be divided into 10-foot linear sections. One discrete sample will be collected from each floor grid cell and sidewall section. Refer to Figure 4-1 for soil sample grid patterns. The exact location of the samples will be determined using a random-number generator. Two numbers will be generated for each grid cell or section. The two numbers will then be used to determine the x and the y coordinates for the location of the sample in a grid or section.

Samples will be collected as described in the SAP and analyzed for total lead. All floor grid cells and sidewall sections with sample concentrations of lead greater than the TCG will be further excavated. Following additional excavation, the grid cell(s) and/or sidewalls in question will be resampled, and the process will continue until the TCG is achieved.

4.9 CHEMICAL ANALYSES

All verification samples collected during the removal activities will be analyzed for total lead (EPA Method 6010B). Stockpile samples will be analyzed for Title 22 metals (EPA Method 6010B/7000). Additional hazard classification analyses will be performed on stockpile samples using leaching procedures such as STLC by the California WET method and TCLP by EPA Method 1311.

4.10 WASTE DISPOSAL

This section describes the disposal methods for the waste materials generated at the site including solid waste, wastewater, contaminated soil, and uncontaminated soil and debris.

4.10.1 Solid Waste and Wastewater Disposal

All discarded materials, waste materials, or other objects will be handled in such a manner to control the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on site. All used personal protective equipment (PPE) materials will be temporarily stored in 55-gallon drums and later disposed at a CERCLA-approved and permitted landfill or TSDF. The wastewater generated from personnel and equipment decontamination will be stored in 55-gallon drums. A sample of the wastewater will be collected and analyzed as described in the SAP to determine if it is a hazardous waste, and then appropriately transported to an off-site disposal and/or treatment facility.

4.10.2 Contaminated Soil Transportation and Disposal

Following excavation, stockpiling, and classification, all excavated soil will be disposed of according to the final waste classification. Disposal may be a combination of options determined by the hazardous classifications as follows:

- Soil and debris classified as RCRA hazardous waste will be transported to an appropriately permitted and CERCLA off-site rule-approved hazardous waste landfill for treatment, if necessary, and disposal.
- Soil and debris classified as non-RCRA hazardous waste will be transported to an appropriately permitted and CERCLA off-site rule-approved hazardous waste landfill for disposal.

Contaminated soil will be loaded into trucks for transportation to the appropriate off-site disposal facilities. Loaded trucks will be weighed on a portable truck scale to ensure compliance with Department of Transportation (DOT) regulations. A hazardous waste manifest will be filled out for each load and submitted to the DON to sign as generator. Original copies of the manifest will be provided to the transporter for shipment.

Trucks hauling contaminated waste material for off-site disposal will use Gate Number 9 located on Westminster Avenue to exit NAVWPNSTA Seal Beach. The trucks will travel east on Westminster Avenue to Bolsa Chica Road, then go north on Bolsa Chica Road to enter the 405 Freeway. Trucks hauling contaminated waste material for off-site disposal will not be allowed to travel on Seal Beach Boulevard.

4.10.3 Traffic Control

Traffic controls will be utilized to provide for the efficient completion of the work activities in a safe working environment while minimizing the impact on the normal traffic flow. Traffic controls will be required during removal activities in the excavation and stockpile areas to provide for equipment operation and truck loading. All traffic control activities shall conform to the applicable specifications of the *State of California Manual of Traffic Controls for Construction and Maintenance Work Zones* (California Department of Transportation [Caltrans], 1996) and will be approved by the DON.

4.11 BACKFILL AND COMPACTION

After verification sampling has determined that no further excavation is required, a field survey will be conducted to determine the final extent of the excavated area and the total amount of material excavated. This information will also be used to determine the amount of backfill required to return the area to its original grade.

The excavation area will be backfilled using clean fill (soil that does not contain chemical compounds with concentrations above the upper limit background values established for NAVWPNSTA Seal Beach) material obtained locally from an off-site source. Prior to delivery to the site, the imported fill material will be tested to certify that it is free of any contaminants. The fill material will be placed in the excavation area in 12-inch compacted lifts. The backfill material will be compacted to 90 percent of the maximum dry density as measured by the modified Proctor test (American Society for Testing and Materials [ASTM] D 1557). A minimum of two in-place density tests will be performed for each lift. The final 6 inches of backfill will not be compacted, but will be graded for site restoration and re-vegetated with annual grass.

4.12 SITE RESTORATION

After the excavation has been backfilled to the original grade, the area will be restored to a condition consistent with its surroundings. Six inches of clean topsoil material will be placed over the graded areas and covered with sod containing annual grass species.

4.13 DEMOBILIZATION

Demobilization will consist of decontamination of all equipment, cleaning the project site, inspection, and certification of completion. The activities will include decontamination and removal of all construction equipment and materials as well as collection and disposal of all contaminated material including decontamination water and disposable equipment for which decontamination is inappropriate.

Heavy equipment will be decontaminated using heavy brushes to remove soil and dirt attached to the equipment surfaces. Special attention will be paid to removal of material on and within the bucket and undercarriage of the excavator. Tools and items for which decontamination is difficult or impossible to verify will remain on site until completion of the work for subsequent packing and off-site disposal at an approved disposal facility. Examples of such items are rope and lumber. Decontamination of temporary facilities located within the support zone will be limited to exterior cleaning.

Prior to removal from site, all decontaminated equipment and material will be inspected and accepted by the SHSS and the Project Superintendent. These individuals will certify that decontamination was performed for all equipment and materials. A copy of each decontamination certificate will be provided to the ROICC and vendors, if requested. The original certificate will be maintained in the project file.

Site cleaning work will include repair of any erosion or runoff related damage; grading and landscaping of all areas used for construction; removal of all materials such as excess construction material, wood, debris and other foreign material; and removal of all construction equipment. The site administrative support complex will be disconnected from electrical,

telephone, and water lines. All office and storage trailers will be removed and returned to the rental company.

5.0 ENVIRONMENTAL PROTECTION PLAN

This EPP provides a program to protect existing environmental conditions and to facilitate the tracking of compliance requirements applicable to the IRP Site 73 removal action at NAVWPNSTA Seal Beach. The plan describes the associated environmental compliance procedures and the specific environmental permitting, regulatory, procedural, and training requirements. This plan is also a primary component of FWENC's Compliance Program, which includes on-site environmental compliance inspections.

5.1 EXISTING NATURAL RESOURCES

NAVWPNSTA Seal Beach includes 911 acres of the Seal Beach National Wildlife Refuge (SBNWR). IRP Site 73 is located northwest of the SBNWR. Water resources such as the coastal salt marshes, wetlands, open water, tidal channels, and mudflats that are contained in or are adjacent to the SBNWR are not considered to be resources potentially affected by the proposed remediation of this site. The existing natural resources associated with IRP Site 73 are biological in nature.

5.1.1 Biological Resources

IRP Site 73 is an unpaved site covered with manicured turf and a few trees.

Biological resources at the site are minimal because of significant human activity and limited vegetative habitat due to regular mowing at this site. Terrestrial ecological inhabitants, such as ground squirrels and rabbits, have been observed at IRP Site 73. In addition, the mourning dove, California ground squirrel, and American kestrel are all commonly observed on maintained grassy areas near NAVWPNSTA Seal Beach.

None of these species are state or federally listed as endangered, threatened, or special status.

5.2 REGULATORY REQUIREMENTS

IRP Site 73 is identified under the DON IRP and is being remediated in accordance with CERCLA and relevant requirements of other laws and regulations. The remediation process at NAVWPNSTA Seal Beach is governed by a Federal Facility Site Remediation Agreement to which the DON, DTSC, and RWQCB are parties. Remediation of IRP Site 73 is designated as a NTCRA under CERCLA guidance.

A Final EE/CA (BNI, 2002) has been prepared for this site in accordance with the CERCLA guidelines. Based on the analysis in the Final EE/CA (BNI, 2002), the DON recommends a removal action for IRP Site 73, which includes excavation and off-site disposal. This alternative is recommended because it best meets the NCP criteria of overall protectiveness of human

health; compliance with ARARs; long-term effectiveness; reduction of mobility, toxicity, or volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance. Implementation of the removal action at IRP Site 73 requires that impacted soil above the TCG for lead be excavated, stockpiled and transported off-site to an appropriately permitted TSDF. This section identifies the removal action activities that must be performed in accordance with applicable regulatory requirements. Prior to the start of work, the DTSC and RWQCB will be notified of the intent to begin cleanup. A complete discussion of ARARs and evaluation of potential ARARs is presented in the Final EE/CA (BNI, 2002). The specific environmental/regulatory requirements for implementation of the removal action are presented below.

5.2.1 Specific Environmental/Regulatory Requirements

Hazardous Waste Management

Excavated soils and waste material that are classified as hazardous waste will be temporarily staged on 20-mil polyethylene liners pending off-site disposal. Waste staged on site will be protected from run-on and runoff and will be covered to prevent wind dispersion. Permits are not required by NAVWPNSTA Seal Beach, as the generator, for the transportation or disposal of hazardous waste off site. NAVWPNSTA Seal Beach has an EPA generator identification number that will be used on manifests accompanying each hazardous waste shipment.

Air Emissions

Substantive requirements of SCAQMD Rules 401, 403, 404, and 405 relating to visible emissions, fugitive dust, and particulate matter emissions must be complied with; however, no permits are required. A grading permit is not required, as the federal government is exempt under county ordinance, provided grading is supervised and inspected by a registered professional engineer.

Base Approvals

FWENC will coordinate with the ROICC and the NAVWPNSTA IR Program Manager to obtain necessary station approvals for the excavation of impacted soil at IRP Site 73. Possible approvals may include underground utility clearance and selection of the analytical laboratory and off-site disposal facilities.

5.2.2 Excavation Activities

Excavation activities will be performed in accordance with pertinent regulatory requirements. The applicable regulations along with the methods to assure compliance with these regulations are described below.

Excavation Management Plan

Unstable earth conditions are not expected at this site during the excavation or construction operations period. The maximum vertical extent of contamination is estimated to be 3 feet. For the most part, the excavation will be approximately 1.5 feet deep over the entire site. Excavations of up to 4 feet deep will be cut vertically. If verification sampling shows excavation is necessary to 5 feet or deeper, the excavation (up to 7 feet) will be sloped with a ratio of 1½ horizontal to 1 vertical (1½H:1V). Daily inspections of excavations by a competent person will also be performed to assess the stability of the slopes and excavated areas. Any excavation deeper than 5 feet will require notification of OSHA, and excavation permits will be posted. Adherence to OSHA excavation regulations and permits will be followed. All excavations will be conducted in accordance with CCR Title 8, Sections 1539 through 1541, and 29 CFR, Parts 1910 and 1926, requirements.

Because of the potential archaeological significance of the site, an archaeological data recovery will be conducted during the excavation of the soil in accordance with the Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118 (included as Attachment A in Appendix C) approved by the SHPO. An archaeologist and a Native American monitor will be present at the site to monitor the excavation and examine soil for its archaeological significance. Refer to Attachment A in Appendix C for the protocol of the Archaeological Data Recovery Plan for Archaeological Site CA-Ora-322/1118.

Fugitive Dust

Fugitive dust emissions are expected from soil excavation and waste handling activities. All removal activities must comply with substantive portions of SCAQMD Rules 401 (b)(1)(A), 403, 404, and 405 pertaining to fugitive dust emissions and discharge of arsenic, chromium, and lead or lead compounds. Dust will be controlled during excavation with water application. Environmental ambient air monitoring will be performed during removal activities using upwind and downwind monitoring. The results of air monitoring will be used to determine if additional measures are required to control adverse impacts from airborne contaminants. Measures may include increased PPE levels for workers, reduction or stopping of excavation activities, or dust abatement using water application or covering stockpiles with plastic sheets.

Floodplains and Wetlands

IRP Site 73 is not located within a floodplain nor is the area considered a wetland. Therefore, requirements pertaining to floodplain and wetlands protection are not applicable to this removal action.

Endangered Species and Migratory Birds

The SBNWR is habitat for five bird species listed as endangered by either federal or state agencies. These birds are the California least-tern, light-footed clapper rail, the California brown pelican, the peregrine falcon, and the Belding's savannah sparrow. There are no known reported sightings of these species at IRP Site 73.

The removal action is not expected to affect the wildlife or their habitats. However, the SBNWR Manager will be informed of the construction schedule and dates prior to conducting any removal activities at the site.

Worker Health and Safety

All excavation activities will be performed in accordance with OSHA requirements for worker safety. The SHSP (prepared and provided under a separate cover and as a standalone document) provides requirements and guidelines that will be utilized in the field to protect the health and safety of workers. A SHSS will provide full time oversight of activities during construction to ensure compliance with OSHA and the SHSP.

Waste Characterization

State and federal regulations require waste generators to determine if a waste is hazardous. As indicated in Section 3.0, the impacted soil at IRP Site 73 may potentially be classified as RCRA hazardous or California non-RCRA hazardous waste.

Excavated material will be representatively sampled and analyzed to determine the hazard classification prior to transport off site. Analytical testing will be conducted at a Department of Health Services (DHS)-certified and Naval Facilities Engineering Service Center-evaluated analytical laboratory. The waste profiling (waste classification determination) will be based on the results of the soil sample analyses. Analytical methods used for waste classification may include total metals, TCLP, and WET.

5.2.3 Waste Management and Disposal

There are several waste streams that may result from the excavation of the impacted soil and associated activities. A description of potential waste streams is presented below.

Decontamination Wastewater

Wastewater will be generated from equipment and personnel decontamination. All wastewater generated will be collected and transferred to 55-gallon drums. Upon completion of removal activities, the wastewater will be sampled to determine if it is a hazardous waste. Drums of decontamination water will be labeled with respect to contents and will be staged in a predetermined secured area with secondary containment and spill control equipment. Weekly

inspections of the drum storage area will be conducted and documented to ensure drums are properly labeled, sealed, and in good condition. Following completion of the project, the wastewater will be properly transported to an appropriately permitted facility for treatment or disposal.

Contaminated Soil

Contaminated soil will be excavated from IRP Site 73, temporarily staged on site, and transported off site to a permitted disposal facility. The impacted soil will be excavated in order to achieve the site-specific TCG established for lead. Currently, the following waste streams are anticipated:

- RCRA hazardous soil (as defined by California and EPA regulations)
- Non-RCRA hazardous soil (as defined by California regulations)
- Non-hazardous soil (soil that contains COCs in excess of respective TCGs, but does not contain concentrations exceeding STLC or TTLC and does not contain concentrations in the TCLP extract exceeding the EPA regulatory levels for a RCRA hazardous waste)
- Refuse including grubbing material

The following disposal options will be applied to the waste soil and refuse described above:

- Soil classified as non-hazardous or non-RCRA hazardous and refuse/grubbing material will be transported to a CERCLA off-site rule-approved Class I hazardous waste facility in California or an out-of-state CERCLA-approved and appropriately permitted landfill.
- Soil classified as RCRA hazardous will be transported to a CERCLA-approved and permitted Class I facility for treatment and/or disposal.

Use of any disposal facility is subject to approval under FWENC subcontractor qualification procedures.

Used Personal Protection Equipment

Construction activities will be performed in Level D or modified Level D. Depending upon air monitoring results, protection level may be upgraded to Level C. Used PPE will be temporarily stored in 55-gallon drums and later disposed of at an appropriate landfill. Management of the drums of PPE will be similar to management of the drums of decontamination wastewater described above.

Miscellaneous Construction Debris

Clean construction debris such as concrete footings, torn polyethylene liner, and miscellaneous debris may be encountered during construction activities. Clean construction debris will be transported to an appropriate licensed landfill for disposal. Debris that has been in contact with contaminated soil and that cannot be effectively decontaminated will be disposed of along with the soil. Use of any disposal facility is subject to approval under FWENC subcontractor qualification procedures.

5.2.4 Waste Minimization

The following waste minimization techniques will be observed during field activities to reduce the volume of waste generated:

- Do not contaminate materials unnecessarily.
- Take only the material (such as chemicals) needed to perform the work activity, additional material can be brought to the work location if it is found to be necessary.
- Materials can be stored in large containers, but the smallest reasonable container will be used to transport the material to the location where it is needed.
- Maintain cleaning and extra sampling supplies outside any potentially contaminated area to keep them clean.
- Maintain or construct prefabricated materials; for example, barriers and support equipment outside potentially contaminated areas.
- Perform mixing of detergents or decontamination solutions outside potentially contaminated areas.
- Do not place media of different hazard classification together.
- Use drop cloths or other absorbent material to contain small spills or leaks.
- Avoid a bellows effect when double-bagging contaminated materials.
- Use containers to minimize the spread of contamination.
- Do not place contaminated materials with clean materials.
- Cover wooden pallets inside the exclusion zone with plastic.
- Decontaminate and re-use material and equipment when practical.
- Use volume reduction techniques when practicable.
- Verify that waste containers are solidly packed to minimize the number of containers.
- Use less hazardous substances whenever possible (that is, bring only the volume of standard solutions needed for testing, use minimal amounts of decontamination water and solvent rinses).

5.2.5 Waste Containerization and Storage

Potential hazardous waste will be stored on 20-mil liners in covered stockpiles (excavated soil) or containers (wastewater and PPE) on site. DOT-trained personnel will perform container selection based on type and quantity of waste to be generated. Containers may include DOT-specification drums or roll-off bins for regulated hazardous material. DOT-specification containers are not required for non-hazardous material that does not meet a DOT hazard class. NAVWPNSTA Seal Beach personnel will maintain an inventory of waste containers for later reporting and inspection.

All containerized hazardous waste will be stored in DOT-approved containers at designated temporary storage area(s). Prior to commencing project activities, the FWENC Site Manager will, in conjunction with the NAVWPNSTA Seal Beach personnel, select areas for the temporary staging and storage of excavated soil, debris, investigation-derived materials, decontamination fluids, and PPE. Where appropriate and feasible, these areas will include secondary containment.

Containerized hazardous waste must be stored in accordance with 22 CCR, Sections 66264.170 through 177 (Use and Management of Containers). Containers of hazardous waste will be inspected and logged weekly and portable tanks inspected daily while the fieldwork is in progress. Inspections will include an evaluation for proper labeling, secure closure, the condition of each container/tank, number of containers/tanks, and condition of the storage area(s). Any signs of deterioration, leaking, or dents will be noted, and containers will be immediately over-packed or the tanks will be drained, if necessary. Standing water will be removed from the containment area as necessary. Inspection results will be provided to NAVWPNSTA Seal Beach. All containers will be checked to ensure labels and markings are in good condition. DOT information for hazardous materials, including proper shipping descriptions and hazard class labels, will be added to containers prior to shipping. Hazardous waste may be stored on site in stockpiles or containers for a maximum of 90 days. Hazardous waste may be stored on site in portable tanks for a maximum of 60 days. The 60 and 90 days begin on the date that the waste is first generated and containerized or stockpiled.

For stockpiled soil, measures will be taken to prevent contact of runoff water or rainwater with the stockpiled material in accordance with the RCRA staging pile regulations of 40 CFR, Part 264.554, and Section 25123.3 of the California Health and Safety Code provision for stockpiling of non-RCRA hazardous soil. Excavated soil will be placed on a 20-mil polyethylene liner. The stockpile area will be bermed with clean soil or sandbags to prevent surface water runoff from coming into contact with the stockpiled soil. In addition, to prevent rain from coming into contact with the stockpiled soil and to minimize wind dispersion of particulate matter, the stockpiles will be covered with a 6-mil liner and secured with sandbags at the end of each workday.

5.2.6 Labeling

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 material was first put in the container)
- Date container sampled
- Parameters used for analysis
- "ANALYSIS PENDING - POTENTIALLY HAZARDOUS"

Upon the determination that the material in the waste container is hazardous, the container will immediately be labeled with a completed commercial EPA "HAZARDOUS WASTE" label. The label will include the accumulation start date and other requested information and managed as defined in 22 CCR, Sections 66262.30 through 66262.34, Pre-Transport Requirements.

5.2.7 Waste Transport

Hazardous material will be transported by a subcontractor approved under FWENC subcontractor qualification procedures. The transporter will have appropriate licenses, including an EPA identification number. Hazardous material including hazardous waste will be properly classified, described, packaged, marked, and labeled for shipment as required by applicable sections of 49 CFR, Sections 171, 172, 173, 178, and 179, and 22 CCR, Sections 66262.10 through 66262.45. Properly DOT-trained personnel will perform DOT functions.

Shipping Description – Material that does not exhibit one of the nine DOT hazard classes (explosive, flammable, poison, combustible, and so forth) is not regulated under DOT rules for the transportation of hazardous material. The Compliance Officer or the DOT Coordinator will

confirm this description prior to shipment. The applicable DOT shipping description, EPA hazardous waste number, and the California waste code will be selected based on the results of the waste characterization.

- **Marking and Labeling** – The shipping name, hazard class, identification number, technical names, EPA markings and waste code numbers, and consignee/consignor designations must be marked on packages for shipment in accordance with 49 CFR, Part 172. This information will be marked on each roll-off bin after consultation with the Compliance Officer or DOT Coordinator.
- **Placarding** – Vehicles will be appropriately placarded in accordance with 49 CFR, Part 172.
- **Manifest** – Hazardous materials shipped off site must be properly manifested. Manifests will be completed by FWENC and require DON signature before the waste leaves the site. Copies of all manifests will be retained in the project files, original copies are sent with the transporter.
- **LDR (Land Disposal Restriction) Certification** – LDR Certification will be prepared and will accompany the manifest if applicable. Copies of all LDR Certifications will be retained in the project files with the signed manifest received from the disposal facility.

5.3 RELEASE PREVENTION, RESPONSE, AND REPORTING

5.3.1 Spill Prevention

Vehicle fueling and management of decontamination waste are the two primary activities that may result in a spill. Spill prevention practices are described below for these two activities.

- **Fueling** – All vehicles will be fueled and serviced prior to moving onto the site. Any on-site fueling of equipment will be conducted within a designated controlled area. No bulk quantities of fuel will be stored on site.
- **Wastewater** – Wastewater will be stored in 55-gallon drums. The drums will be stored within a secondary containment area. Therefore, any spills from the drums or the tank will be contained and will not be released to the surrounding areas.

5.3.2 Spill Response

In the event of a release of hazardous material into the environment, FWENC will initiate action, as specified in the SHSP, to contain or control the release or evacuate the area if the spill is significant or represents an immediate health threat.

Materials Available

Absorbent pads, shovels, and 55-gallon drums will be kept at the site to address the possibility of spills.

5.3.3 Spill/Release Reporting

The steps below outline the chain of communications to be followed if a significant spill of any hazardous substance occurs.

1. Contact FWENC:

Site personnel involved in the spill should immediately contact the FWENC Spill/Release On-Site Coordinator, Project Superintendent, or SHSS who will notify the Project Manager. At least one of these two individuals will be on site during all remedial activities:

SHSS/Project QC Manager:	Carl Jones
On-Site Coordinator and Project Superintendent:	Glenn Nardin

The FWENC SHSS/QC Engineer or the Project Superintendent will contact the NAVWPNSTA IR Program Manager or the ROICC identified below:

NAVWPNSTA IR Program Manager:	Pei-Fen Tamashiro (562) 626-7897
ROICC:	David Crawley (562) 626-7964

2. If a release of a waste or hazardous substance, regardless of quantity, could threaten human health or the environment outside the facility, the Project Manager will verify that the following have been notified by the DON:
   - DHS at (800) 852-7550.
   - National Response Center at (800) 424-8802.
   - Local Emergency Response Coordinator (Fire Department, if necessary).
   - Report releases and submit written follow-up emergency notice under Superfund Act and Reauthorization Amendments, Title II requirements.

3. After taking the above actions, the following persons will be contacted by the Project Manager or the Site Superintendent:

   Craig O'Rourke
   FWENC
   Regional Environmental Manager
   Office: (949) 756-7511

   Jayne Fitzgerald
   FWENC
   Regional Environmental Safety and Quality Manager
   Office: (949) 756-7534

5.4 PROJECT AND PERSONNEL REQUIREMENTS

FWENC personnel training requirements and inspection programs applicable to the removal action at IRP Site 73 are described below. Protocols for inspections by regulatory agencies and third parties are also addressed below.

5.4.1 Personnel Training/Certification Requirements

- Site personnel must have OSHA 40-hour Health and Safety/Emergency Response Hazard Communication and RCRA training.
- Site personnel performing DOT functions (including selecting, packaging, marking, labeling, preparing shipping papers, and loading) must be trained in accordance with the requirements of DOT 49 CFR, Part 172, Subpart H (aka DOT/HM-126F). Subcontractors performing DOT functions must supply proof of training.
- All project personnel (subcontractors and FWENC) will be trained according to FWENC compliance policies and procedures. FWENC personnel records will be verified along with the subcontractors training records prior to project activities.
- All project personnel performing waste management will be certified under FWENC waste management training in accordance with 40 CFR, Part 265.16.

5.4.2 Inspection and Audit Procedures

Site inspections and audits may occur during the remedial activities to assure compliance with the applicable state and federal regulations and the SHSP.

6.0 PROJECT MANAGEMENT

The project management team will be responsible for all technical and administrative aspects of the removal action. Included among the team's responsibilities are the project schedule, staffing, data management, document control, project meetings, and reporting.

6.1 PROJECT SCHEDULE

The proposed schedule for implementation of the removal action is included in this Work Plan as Figure 6-1. The schedule is presented in a critical path method format. The schedule has been prepared using a PC-based cost, scheduling, and control system known as PRIMAVERA®. PRIMAVERA® has many features, including the identification of critical paths and the ability to compare initial base plan to current project schedule.

The schedule includes preparatory, excavation, and restoration activities. Construction activities have been planned to start after approval of the Work Plan and procurement of the necessary equipment, materials, and subcontracting services.

Five main activities will be followed during the course of this project:

- **Stage 1 – Project Startup.** This stage includes preparation of project submittals that include the Work Plan.
- **Stage 2 – Preparatory Activities.** This stage includes notifications, procurement, and archaeological data recovery.
- **Stage 3 – Construction Activities.** This stage includes excavation, stockpiling, characterization, transportation, and off-site disposal of the impacted soils; and verification sampling, backfilling and compaction of the excavated area.
- **Stage 4 – Site Restoration and Decontamination.** This stage includes decontamination of all project equipment; removal of decontamination wastewater, used PPE, and other wastes; followed by final restoration of the site to its original grade and conditions.
- **Stage 5 – Final Report.** This stage includes preparation of a final report to document the results of all removal activities performed at IRP Site 73.

6.2 PROJECT RESPONSIBILITIES

The DON RPM for this project is Mr. Si T. Le. Mr. Le is responsible for project management, budget control, schedule maintenance, and contacting regulatory agencies. Ms. Pei-Fen Tamashiro is the NAVWPNSTA IR Program Manager. Ms. Tamashiro will be responsible for community relations activities and ensuring that the field and remedial activities are in compliance with the applicable rules and regulations. Mr. David Crawley is the ROICC and is responsible for the technical oversight of field activities, coordination of field activities with

different NAVWPNSTA departments and personnel, and QC. Mr. Chris Leadon is the DON Remedial Technical Manager, responsible for the technical oversight and review of the project documents.

FWENC's Deputy Program Manager (DPM), Dr. Jamshid Sadeghipour, PE, will be responsible for general project administration and will ensure the quality of all project activities and deliverables. FWENC's Project Manager, Mr. Hamlet Hamparsumian, will be responsible for general project administration. Mr. Hamparsumian oversees budget, schedule, document preparation, and will ensure the quality of all project activities and deliverables. The Project Superintendent, Mr. Glenn Nardin, will manage fieldwork and provide oversight to the subcontractors. Mr. Nardin will coordinate the field activities with the senior technical staff. Mr. Nardin will also coordinate these activities with the SHSS, and coordinate efforts among all subcontractors. Mr. Carl Jones will act as the Project QC Manager and SHSS. As CQC Engineer, Mr. Jones will coordinate with the QC Program Manager, Ms. Mary Schneider, to ensure that all field activities are in compliance with the project specifications.

The following is a list of key project personnel contacts:

Agency	Contact	Project Title
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Si T. Le (619) 532-1235	DON RPM
Naval Weapons Station Seal Beach 800 Seal Beach Boulevard Building 110 Seal Beach, CA 90740-5000	Pei-Fen Tamashiro (562) 626-7897	NAVWPNSTA IR Program Manager
ROICC Los Angeles Naval Weapons Station Seal Beach Building 230 Seal Beach, CA 90740-5000	David Crawley (562) 626-7964	ROICC
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Chris Leadon (619) 532-3878	Remedial Technical Manager
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Ann Garrett (619) 532-4261	Contracting Officer
California Environmental Protection Agency Department of Toxic Substances Control Office of Military Facilities 5796 Corporate Way Cypress, CA 90630	Katherine K. Leibel (714) 484-5446	DTSC-RPM

Agency	Contact	Project Title
California Regional Water Quality Control Board, Santa Ana Region 3737 Main Street, Suite 500 Riverside, CA 92501-3348	Patricia Hannon (909) 782-4498	RWQCB-RPM
FWENC 1940 East Deere Avenue, Suite 100 Santa Ana, CA 92705	Jamshid Sadeghipour (949) 756-7519	DPM
FWENC 1940 East Deere Avenue, Suite 200 Santa Ana, CA 92705	Hamlet Hamparsumian (949) 756-7520	Project Manager
FWENC 1940 East Deere Avenue, Suite 100 Santa Ana, CA 92705	Mary Schneider (949) 756-7586	QC Program Manager
FWENC 1940 East Deere Avenue, Suite 100 Santa Ana, CA 92705	Glenn Nardin (714) 822-4691	Superintendent
FWENC 1940 East Deere Avenue, Suite 100 Santa Ana, CA 92705	Carl Jones (949) 756-7538	Project QC Manager/SHSS

6.3 DATA MANAGEMENT

The following is a summary of the data management tools that will be employed for the duration of this project:

- PRIMAVERA® and Harper Shuman accounting software will be utilized for all schedule and project cost tracking.
- Home and field office staff for technical data management will utilize Microsoft Excel® spreadsheets. Microsoft Word® will be employed for word processing.

6.4 DOCUMENT CONTROL

FWENC's internal document control procedures will be followed for the duration of the project. Additional guidance provided by the DON will be utilized for document control, particularly for matters relating to regulatory compliance. Management of internal and external correspondence will be administered at the home office in San Diego, California. Document control will include assigning an alphanumeric coding to each submittal. Complete project files will be maintained in a secure, dry area at the field office.

6.5 MEETINGS AND REPORTS

Project status meetings will be held weekly (or at less frequent intervals if desired by the DON) at the field office during the field construction activities. The Project Manager, Project Superintendent, Project QC Manager, and other selected individuals will be required to attend these meetings with the ROICC and the NAVWPNSTA IR Program Manager. The agenda of the project status meetings will include the following:

- Review and approval of minutes of previous meeting
- Review of work progress
- Field observations, problems, and conflicts
- Problems which impede construction schedule and proposed corrective actions
- Review of off-site delivery schedules
- Corrective measures and procedures to regain projected schedule
- Revisions to construction schedule
- Forecast of progress for next succeeding work period
- Coordination of schedules
- Review of submittal schedules, if any
- Review of quality/health and safety programs
- Pending changes and substitutions
- Review of proposed changes for effects of construction, completion date, and other aspects of the project
- Other project-related business

Minutes of the meetings will be prepared by FWENC and submitted to the DON. Daily reports will be prepared by the Project Superintendent and the Project QC Manager and submitted to the ROICC. Weekly reports will be prepared by the Project Manager and submitted to the RPM, NAVWPNSTA IR Program Manager, and the ROICC. The weekly reports will include works completed by the end of each week and work that is planned for the following week. The weekly reports will be submitted on Tuesday following each week.

7.0 COMMUNITY RELATIONS ACTIVITY

Several 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.

7.1 PUBLIC INFORMATION

The remediation process is being conducted in accordance with the Community Relations Plan prepared by NAVWPNSTA Seal Beach, to facilitate public involvement in the decision-making process. The Work Plan for IRP Site 73 and other documentation associated with remediation activities at NAVWPNSTA Seal Beach are contained in the Administrative Record for this site. The Administrative Record is located at SWDIV, 1220 Pacific Highway, San Diego, California.

In addition, there are two public information repositories where the public can review any of the documents associated with the Administrative Record. The repositories are:

Seal Beach Public Library Mary Wilson Branch - Front Desk 707 Electric Avenue Seal Beach, CA 90740 (562) 431-3584	NAVWPNSTA Seal Beach 800 Seal Beach Boulevard Building 26 Seal Beach, CA 90740 (562) 626-6069

The library is open during the following hours:

Monday and Tuesday	12 noon - 8:00 p.m.
Wednesday and Thursday	10:00 a.m. - 6:00 p.m.
Saturday	10:00 a.m. - 5:00 p.m.
Friday and Sunday	Closed

7.2 PUBLIC PARTICIPATION

To encourage local participation in the hazardous waste cleanup program at NAVWPNSTA Seal Beach, the DON established a RAB. This board is a citizen-based committee representing local community interests. RAB meeting agendas, minutes, and presentation materials are included in the Administrative Record for public review.

To encourage public participation in the NAVWPNSTA Seal Beach hazardous waste cleanup program, the RAB held several meetings during the investigation and preparation of the Final EE/CA (BNI, 2002) and Draft AM/RAP (SWDIV, 2002). All meetings were advertised locally in an effort to encourage public attendance and participation. In addition, the DON has prepared a master mailing list of the local community members, and whenever significant cleanup

activities or decisions are planned, the community members are notified by mail for information purposes and involvement.

The Draft EE/CA (BNI, 2001) for IRP Site 73 was issued to the RAB on November 21, 2001, for a 2-month review period. A public notice was posted in the *Orange County Register* and the *Seal Beach Sun* on November 29, 2001, inviting public comments on the Draft EE/CA (BNI, 2001). The public comment period ended December 29, 2001. The purpose of this public notice was to invite the interested community members to review the subject Draft EE/CA (BNI, 2001) and provide their comments or questions. The recommended action in the Final EE/CA (BNI, 2002) was used to develop AM/RAP, the decision document for the selected removal action at IRP Site 73. The AM/RAP was also subjected to the RAB and regulatory review. The Draft AM/RAP (SWDIV, 2002) was submitted to the agencies and the RAB for review on April 26, 2002.

8.0 REFERENCES

Bechtel National, Inc. (BNI). 2001. *Draft Engineering Evaluation/Cost Analysis for Non-Time-Critical Removal Action at Installation Restoration Program Site 73, Naval Weapons Station, Seal Beach, California.* November.

_____. 2002. *Final Engineering Evaluation/Cost Analysis for Non-Time-Critical Removal Action at Installation Restoration Program Site 73, Naval Weapons Station, Seal Beach, California.* 29 March.

California Department of Transportation (CalTrans). 1996. *State of California Manual of Traffic Controls for Construction and Maintenance Work Zones.*

CH2M Hill. 2002. *Draft Final Focused Site Inspection Phase II Report, Naval Weapons Station, Seal Beach, California.* Volumes 1 and 2. 28 January.

Ogden Environmental and Energy Services Co., Inc. (Ogden) 1997. *Historic Properties Overview and Evaluations on the Naval Weapons Station, Seal Beach.* Prepared for SWDIV. March.

Soil Conservation Service (SCS). 1978. *Soil Survey of Orange County and Western Part of Riverside County, California.* U.S. Department of Agriculture.

Southwest Division Naval Facilities Engineering Command (SWDIV). 2002. *Draft Action Memorandum/Removal Action Plan for Non-Time-Critical Removal Action at Installation Restoration Program Site 73 – Water Tower Area.* April.

United States Geological Survey. 1965 (Photo revised 1981). Seal Beach, California, Quadrangle, 7.5-Minute Series.

FIGURES

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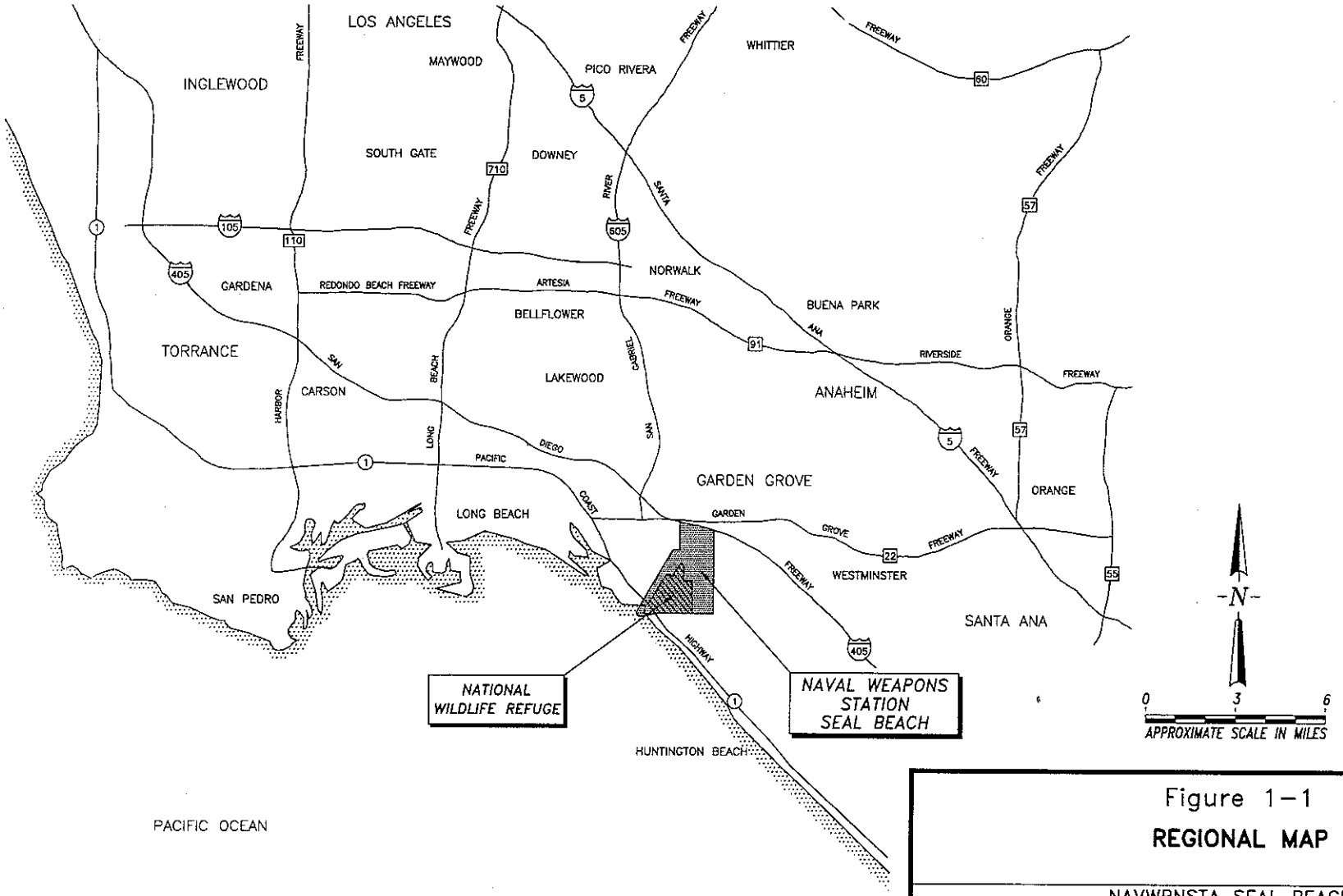

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Figure 1-1

REGIONAL MAP

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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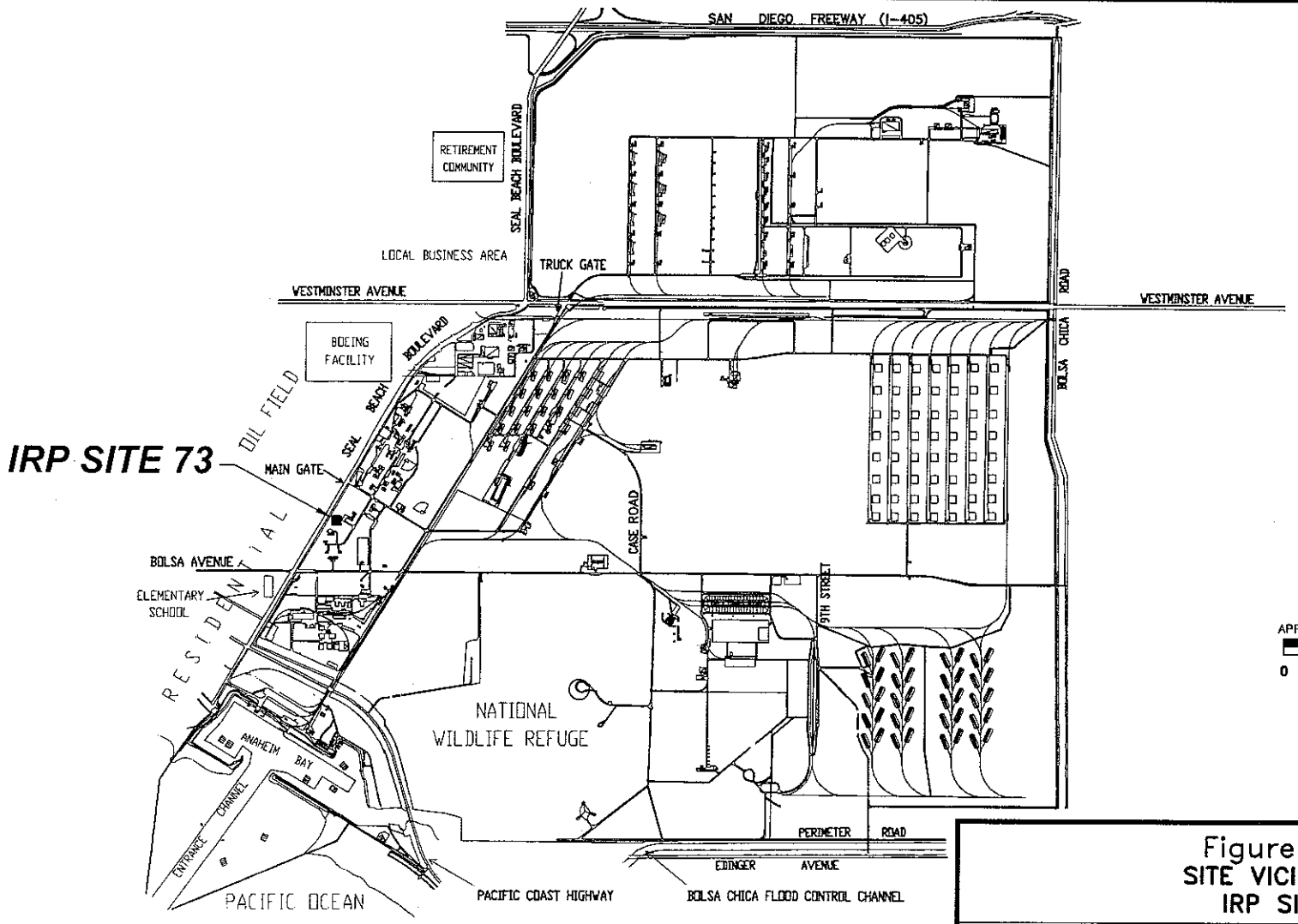

REFERENCE: BNI, 2002.

Figure 1-2
SITE VICINITY MAP
IRP SITE 73

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

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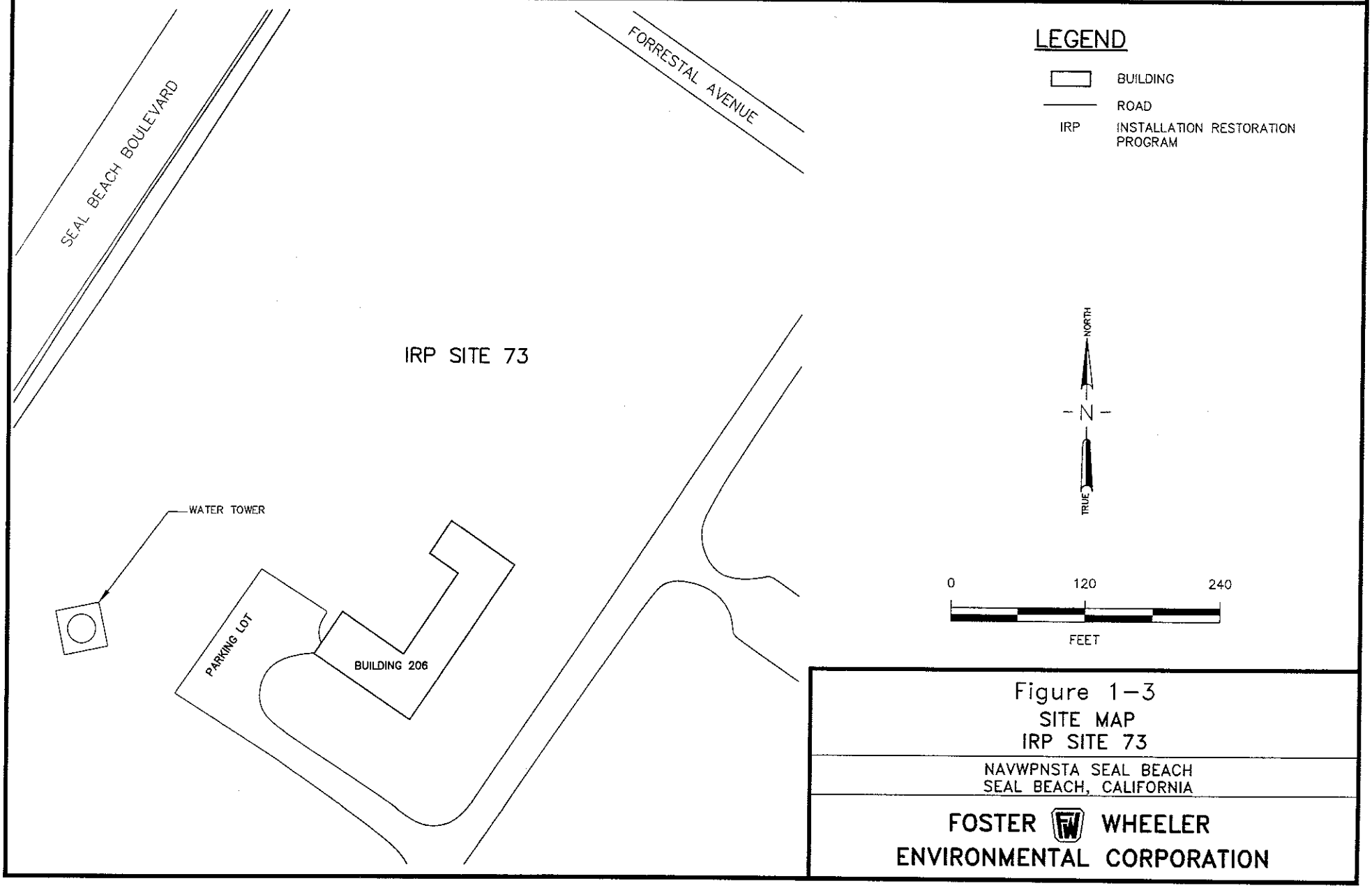
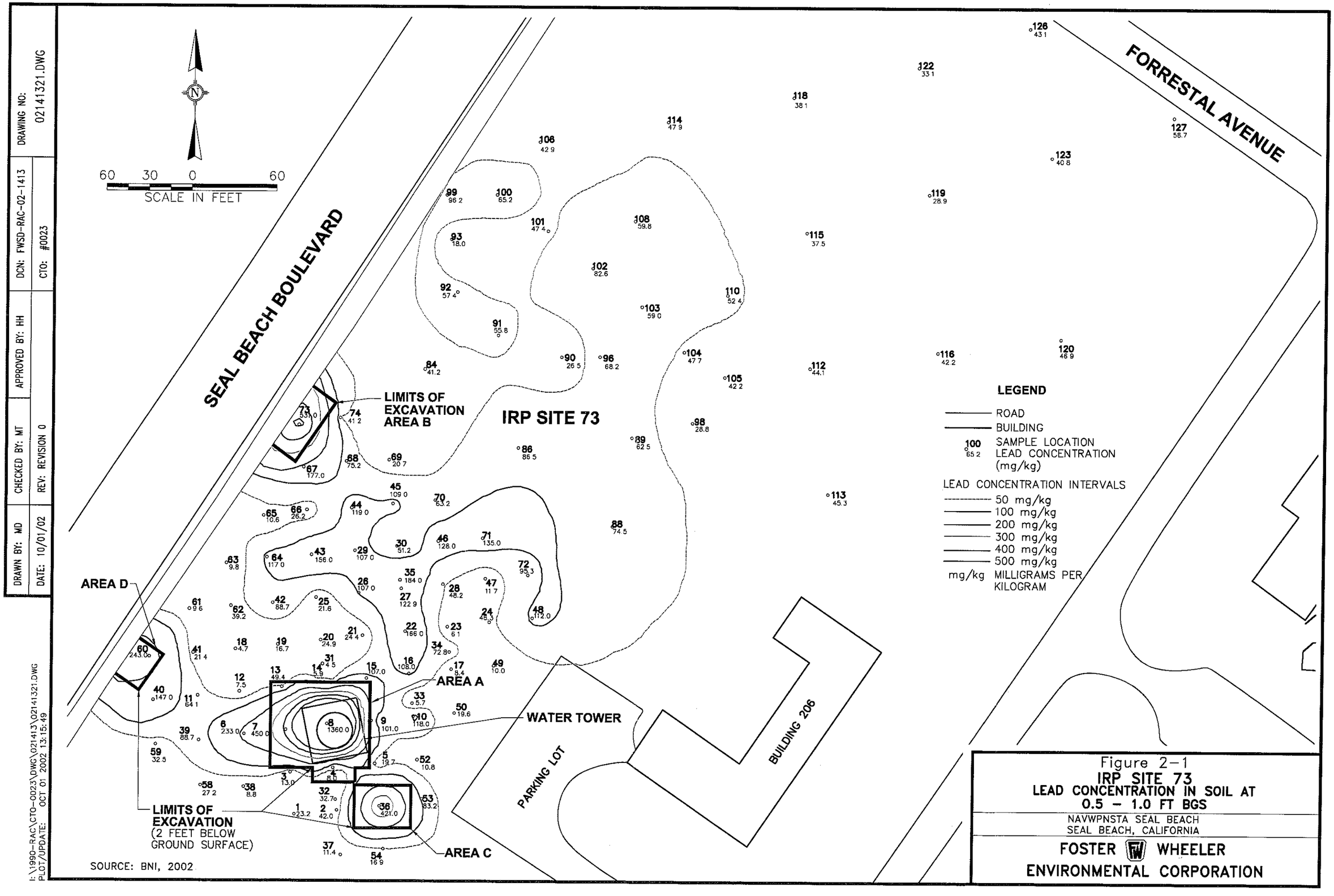


Figure 1-3
SITE MAP
IRP SITE 73

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION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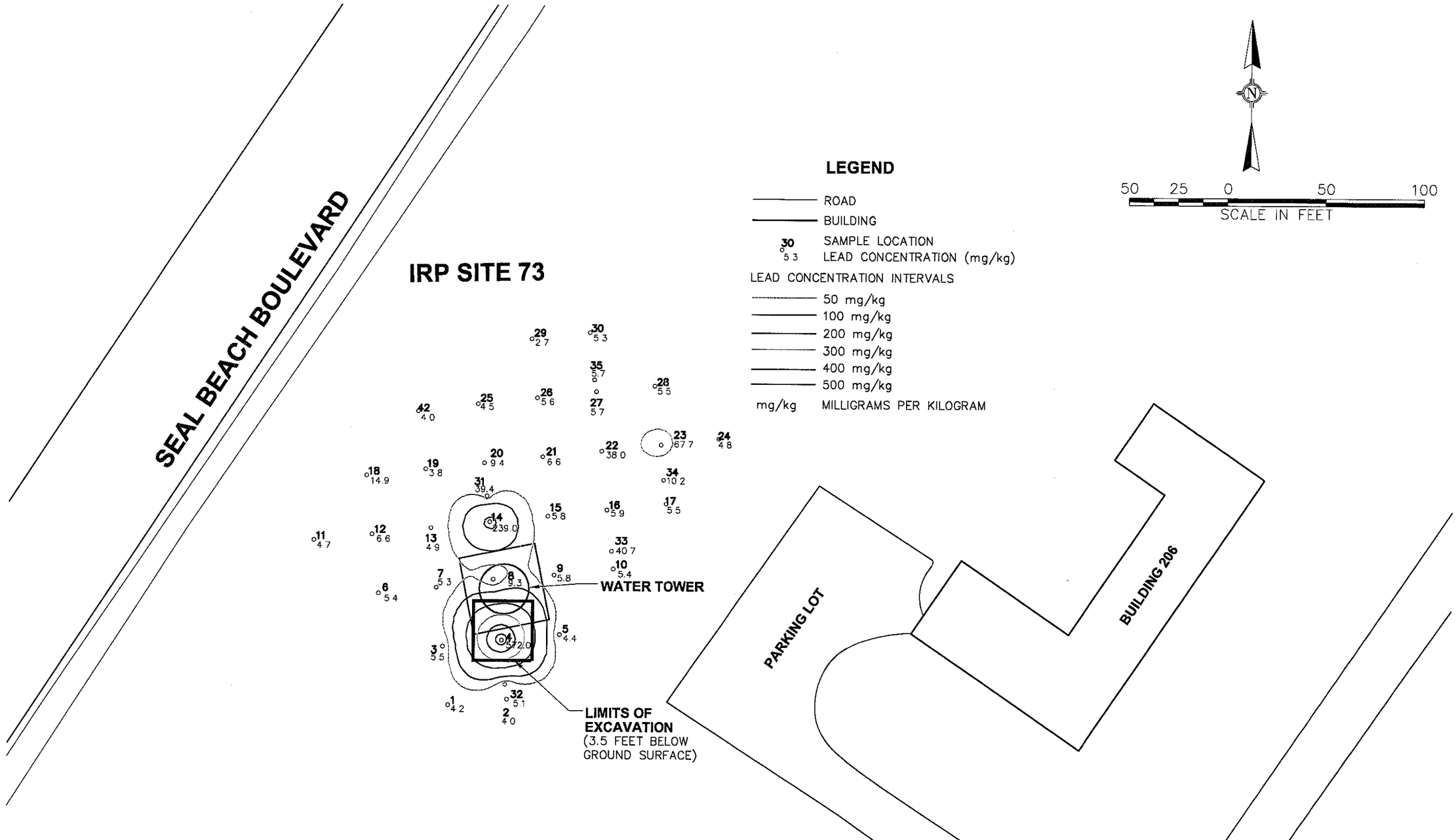
N
60 30 0 60
SCALE IN FEET
SEAL BEACH BOULEVARD
FORRESTAL AVENUE
IRP SITE 73
LIMITS OF EXCAVATION AREA B
AREA D
AREA A
AREA C
WATER TOWER
PARKING LOT
BUILDING 206
LIMITS OF EXCAVATION (2 FEET BELOW GROUND SURFACE)
LEGEND
ROAD
BUILDING
100 SAMPLE LOCATION
65.2 LEAD CONCENTRATION (mg/kg)
LEAD CONCENTRATION INTERVALS
50 mg/kg
100 mg/kg
200 mg/kg
300 mg/kg
400 mg/kg
500 mg/kg
mg/kg MILLIGRAMS PER KILOGRAM
SOURCE: BNI, 2002
Figure 2-1
IRP SITE 73
LEAD CONCENTRATION IN SOIL AT 0.5 - 1.0 FT BGS
NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA
FOSTER WHEELER ENVIRONMENTAL CORPORATION



SOURCE: BNI, 2002.

Figure 2-2
IRP SITE 73
LEAD CONCENTRATION IN SOIL AT 2.0 – 2.5 FT BGS
NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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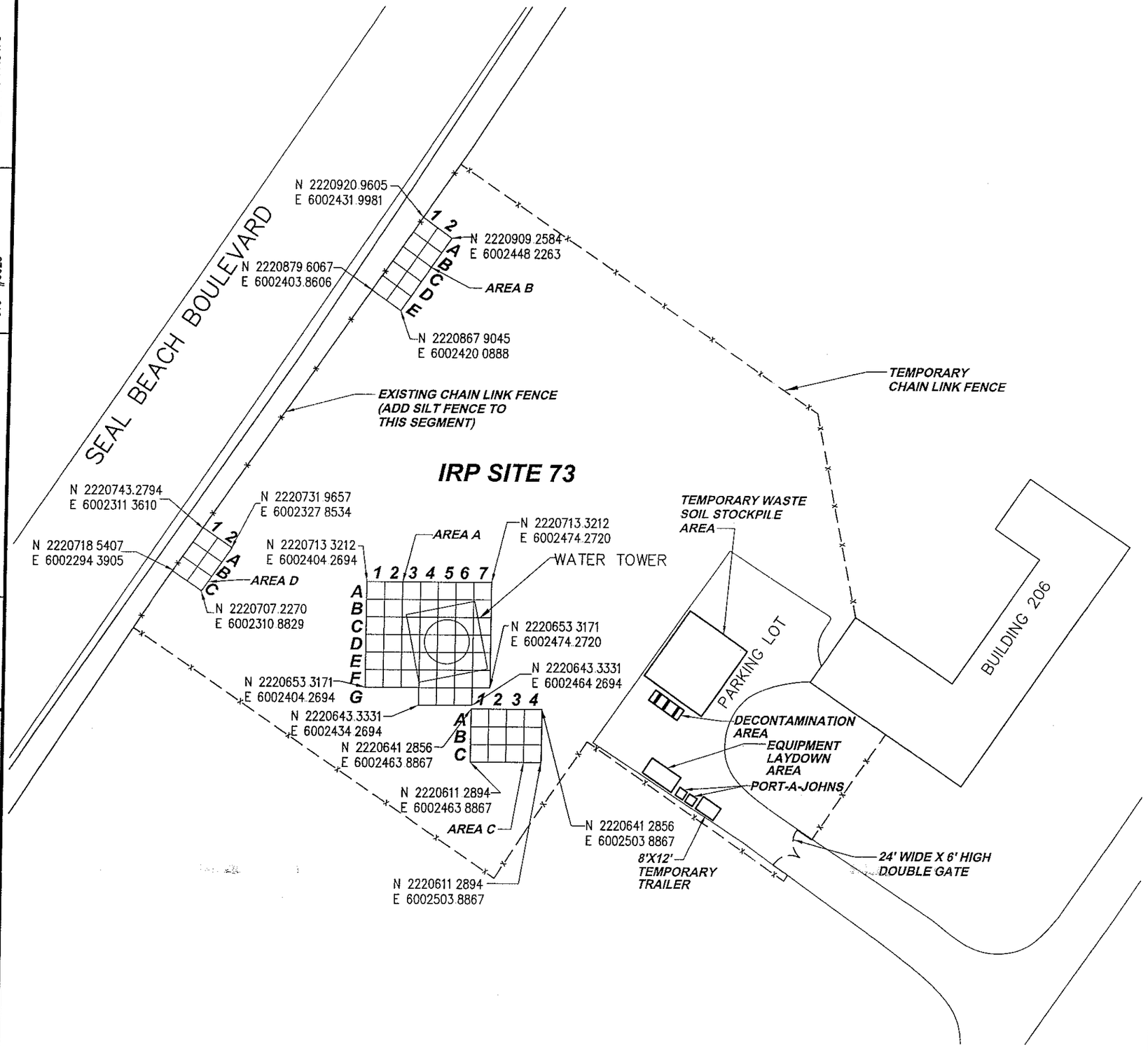

Figure 4-1
IRP SITE 73
PROPOSED SITE LAYOUT AND VERIFICATION SAMPLING GRID

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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CTO #0023
APPROVED BY: HH
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DRAWN BY: MD
DATE: 10/01/02

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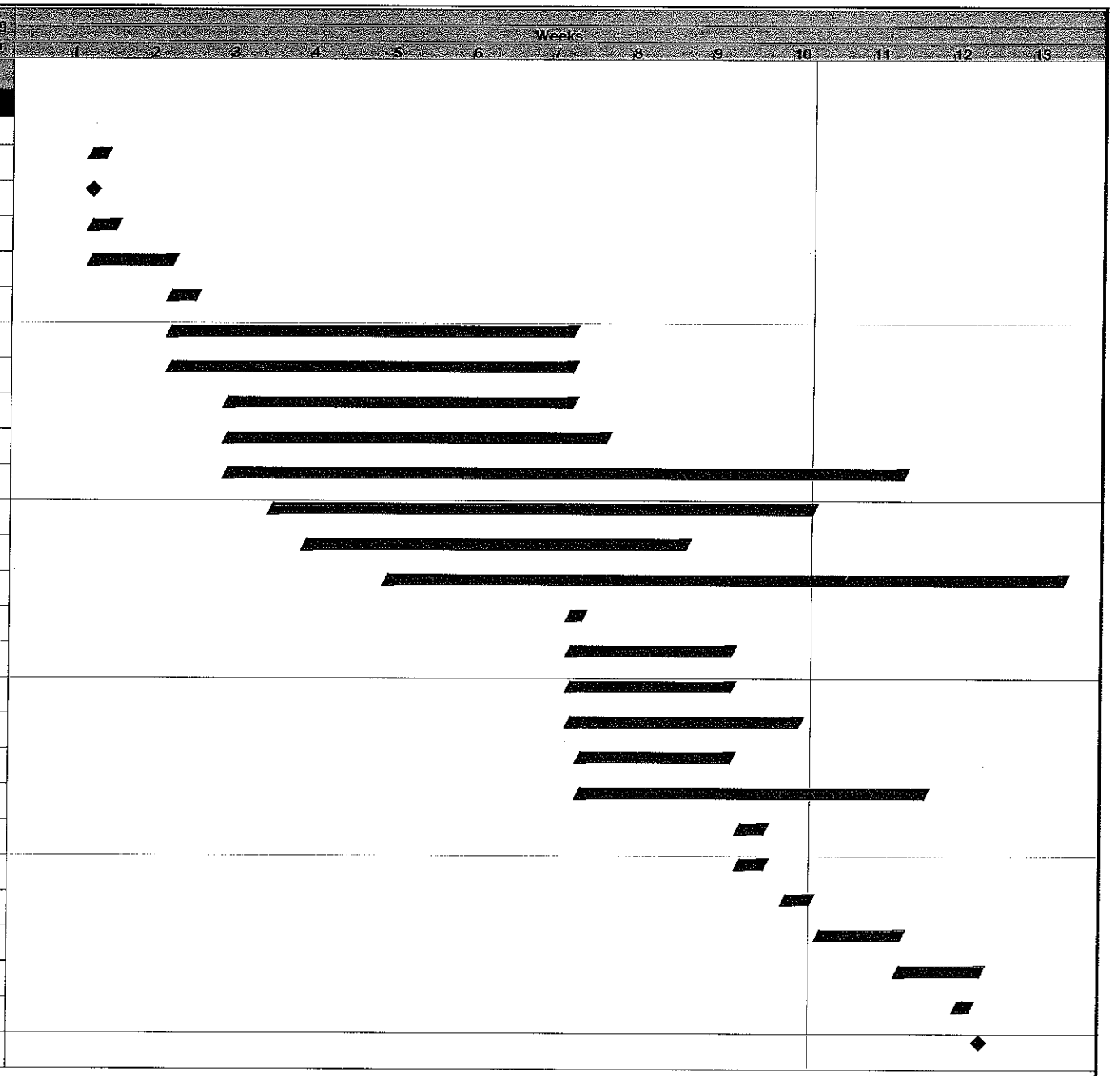
SITE 73 Soil Removal

Construction

TASK L

Activity Description	Orig Dur
Geophysical Survey (Site 73)	1
Mobilization Start (Site 73)	0
Pre-Construction Site Survey (Site 73)	2
Mobilization/Site Preparation (Site 73)	5
Decon Pad Installation (Site 73)	2
Construction Managemt-Archaeological Sub (S 73)	23*
Excavate Contaminated Soils (Site 73)	23
Soil Sampling - verification samples (Site 73)	20
Soil Analysis - verification (Site 73)	23
Data Reduction/Tabulation (Site 73)	39
Waste Sampling-stockpile decon water (Site 73)	30
Stockpile Solid Waste Analysis (Site 73)	23
Data Validation (Site 73)	39
As-built Excavation Survey (Site 73)	1
Backfill / Compaction (Site 73)	10
Load & Haul Backfill Material (Site 73)	10
Trans Waste to Disp Facility (Solid) (Site 73)	13
Compaction Testing (Site 73)	9
Waste Disposal (Solid/Liquid) (Site 73)	20
As-built Survey of Backfilled Area (Site 73)	2
Earthwork Topsoil (Site 73)	2
Site Restoration / Revegetation (Site 73)	2
Decon Water Analysis (Site 73)	5
Demobilization (Site 73)	5
Tear Down Decon Pad (Site 73)	1
Demobilization Complete (Site 73)	0



Start Date	24MAR00
Finish Date	20AUG03
Data Date	29APR02
Run Date	03MAY02 13:23

Early Bar
Progress Bar
Critical Activity

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Foster Wheeler Environmental Corp.
Southwest Division RAC III
CTO 0023 - Seal Beach
Site 73

Sheet 1 of 1

Figure 6-1

APPENDIX A

SAMPLING AND ANALYSIS PLAN

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

CONTRACT NO. N68711-98-D-5713
CTO NO. 0023

APPENDIX A

FINAL

SAMPLING AND ANALYSIS PLAN

Revision 0
January 21, 2003

NON-TIME-CRITICAL REMOVAL ACTION FOR INSTALLATION RESTORATION PROGRAM SITE 73 (WATER TOWER AREA) NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1413

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 500
San Diego, CA 92101

REGISTERED GEOLOGIST
MARK CUTLER
No. 4487
STATE OF CALIFORNIA

Mark Cutler, R.G. 4487
Registered Geologist — 1/21/03 Date

Mary Schneider
Quality Control Program Manager — 1/21/03 Date

Narciso A. Ancog
SWDIV Quality Assurance Officer — 1/21/03 Date

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ABBREVIATIONS AND ACRONYMS

BNI	Bechtel National, Inc.
bgs	below ground surface
COC	chain-of-custody
CTO	Contract Task Order
°C	degrees Celsius
DHS	Department of Health Services
DoD	Department of Defense
DON	Department of the Navy
DQO	data quality objective
DTSC	Department of Toxic Substances Control
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
EWI	Environmental Work Instruction
FWENC	Foster Wheeler Environmental Corporation
HDPE	high-density polyethylene
HNO_3	nitric acid
ICP-AES	inductively coupled plasma-atomic emission spectroscopy
IR	Installation Restoration
IRP	Installation Restoration Program
LCS	laboratory control sample
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mL	milliliter
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
NAVWPNSTA	Naval Weapons Station
NE	not established
NFESC	Naval Facilities Engineering Service Center
PARCC	precision, accuracy, representativeness, completeness, and comparability

ABBREVIATIONS AND ACRONYMS
(Continued)

%R	percent recovery
QA	quality assurance
QC	quality control
RAC	Remedial Action Contract
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
STLC	Soluble Threshold Limit Concentration
SWDIV	Southwest Division Naval Facilities Engineering Command
TCG	target cleanup goal
TCLP	Toxicity Characteristic Leaching Procedure
WET	Waste Extraction Test

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) was prepared by Foster Wheeler Environmental Corporation (FWENC) to support sampling activities for the Non-Time-Critical Removal Action at Installation Restoration Program (IRP) Site 73, Water Tower Area, at Naval Weapons Station (NAVWPNSTA) Seal Beach located in Seal Beach, California. The SAP was prepared on behalf of the United States Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV) under Remedial Action Contract (RAC) No. N68711-98-D-5713, Contract Task Order (CTO) No. 0023. This project-specific SAP includes the Field Sampling Plan and the Quality Assurance Project Plan required for this project.

The purpose of this SAP is to provide the field sampling procedures, quality assurance (QA) and quality control (QC) requirements, and data gathering methods that will be used to support soil remediation activities. The SAP will be used by field and laboratory personnel as a reference document during sampling and analysis. Data quality objectives (DQOs) are also described in this SAP.

The QA elements of this SAP are in accordance with the *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS* (U.S. Environmental Protection Agency [EPA], 2001) to ensure that all data collected are precise, accurate, representative, complete, and comparable to meet their intended use.

The regulatory agencies performing oversight of this project are the Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board, Santa Ana Region.

1.1 OBJECTIVE

The primary objective of this project is to remediate lead-impacted soil at IRP Site 73 below the recommended target cleanup goal (TCG) of 317 milligrams per kilogram (mg/kg) for lead. This value was established based on the ecological risk assessment results presented in the Final Engineering Evaluation and Cost Analysis report prepared by Bechtel National, Inc. (BNI) (BNI, 2002) and negotiations with regulatory agencies. The sampling and analysis objectives to obtain the successful completion of the site remediation activities are as follows:

- Collect confirmation soil samples after soil excavation to determine if excavation is below the TCG for lead. Perform additional excavation until confirmation samples are below the TCG for lead.
- Perform sampling of excavated stockpiled soils and wastewater for disposal purposes, as necessary.

2.0 BACKGROUND

Site location and background, including a site description and previous investigation findings, are presented in Sections 1.0 and 2.0 of the Work Plan. Information presented in the Work Plan will not be duplicated here.

3.0 PROJECT ORGANIZATION

This section identifies the key individuals from the DON and FWENC who are responsible for the oversight and/or implementation of the proposed field activities. The Project Organization Chart is shown in Figure A.3-1. The responsibilities of the team members associated with the sampling activities are presented in Table A.3-1.

3.1 LIST OF POINTS OF CONTACT

The following is a list of the key contacts for the project:

Agency	Contact	Title
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Si Tan Le (619) 532-1235	Remedial Project Manager
Naval Weapons Station Seal Beach 800 Seal Beach Boulevard Building 110 Seal Beach, CA 90740-5000	Pei-Fen Tamashiro (562) 626-7897	NAVWPNSTA Installation Restoration (IR) Program Manager
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Narciso A. Ancog (619) 532-2540	QA Officer
Naval Weapons Station Seal Beach 800 Seal Beach Blvd. Building 230 Seal Beach, CA 90740	David Crawley (562) 626-7964	Resident Officer in Charge of Construction
FWENC 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705	Hamlet Hamparsumian (949) 756-7520	Project Manager
FWENC 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705	Lisa Bienkowski (949) 756-7592	Project Chemist

4.0 SAMPLING STRATEGY

This section describes the collection and analysis of samples to meet the project objectives during field activities. Figures 1-1 and 1-2 in the Work Plan illustrate the location of the project site.

4.1 SOIL CONFIRMATION SAMPLING

Excavation of lead-impacted soils will be conducted during this project The extent of the contaminated soils requiring excavation at IRP Site 73 are confined to two distinct areas with the highest lead concentrations. The larger area is located at the foot of the water tower and is approximately 60 feet wide by 80 feet long. The smaller lead contaminated area is located approximately 210 feet north from the center of the water tower near the station perimeter fence along Seal Beach Boulevard. This smaller area is approximately 50 feet by 50 feet in size. The excavated areas will be divided into grids as illustrated in Figure A.4-1. Some grids will be excavated to a depth of approximately 2 feet; other grids will be excavated to a depth of 3.5 feet (refer to Figure A.4-1 for planned excavation depths of each grid). To assess that the impacted soils have been excavated, confirmatory soil samples will be collected.

The floor of the excavation will be divided into a 10-foot-by-10-foot grid pattern. The sidewalls will be divided into 10-foot linear sections. One discrete sample will be collected from each floor grid cell and 10-foot sidewall section. The exact location of the samples will be determined using a random-number generator. Two numbers will be generated for each grid cell or section. The two numbers will then be used to determine the x and the y coordinates for the location of the sample in a grid or sidewall section.

Each confirmation soil sample collected will be analyzed for total lead. All floor grid cells and sidewall sections with sample concentrations of lead greater than the TCG will be further excavated. Following additional excavation, the grid cell(s) and/or sidewall(s) in question will be resampled, and the process will continue until the TCG is achieved. Confirmatory soil samples will be collected in accordance with the procedures described in Section 6.1 of this SAP.

Groundwater is expected to be approximately 15 feet or more below ground surface (bgs); therefore, it is not anticipated to encounter groundwater during excavation activities.

4.2 WASTE CHARACTERIZATION SAMPLING

Wastes generated during field activities will include a soil stockpile and decontamination wastewater. These two waste streams will be sampled as follows.

4.2.1 Stockpile Sampling

Approximately 400 to 500 cubic yards of soil will be generated during excavation activities. The stockpiled soil will be sampled for waste classification purposes and subsequent off-site disposal. Five soil samples will be randomly collected from approximately each 125 cubic yards of excavated soil and stockpiled. These five samples will be composited into one stockpile sample in the laboratory for analysis. This sampling frequency will yield approximately four composited stockpile samples.

The sample locations will be determined as described in Section 6.2.1 of this SAP. At a minimum, stockpile samples will be analyzed for Title 22 metals. Waste characterization leaching procedures, such as the Soluble Threshold Limit Concentration (STLC) and Toxicity Characteristic Leaching Procedure (TCLP), will be performed as applicable. Additional analyses may also be required per the disposal facility for waste characterization purposes.

4.2.2 Wastewater Sampling

Wastewater generated during decontamination activities will be stored on site in a storage tank. One sample will be collected as described in Section 6.2.2 of this SAP from the storage tank and analyzed at a minimum for Title 22 metals. Additional analyses may also be required per the disposal facility for waste characterization purposes.

5.0 REQUEST FOR ANALYSIS

This section describes the analytical methods, containers, and preservative requirements. Additionally, field QC samples will be discussed in this section.

5.1 ANALYTICAL METHODS

The following EPA analytical methods (*EPA Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846, Third Edition,* and final updates [EPA, 1986]) will be used to analyze soil samples during this project.

- Total lead by EPA Method 6010B
- Title 22 metals by EPA 6010B/7000
- STLC by the California Waste Extraction Test (WET)
- TCLP by EPA Method 1311

Detailed information on methods, calibration criteria, project-required reporting limits, and QC acceptance criteria are presented in Section 8.0.

5.2 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Table A.5-1 lists the sample containers, preservatives, and holding time requirements for samples.

5.3 FIELD QUALITY CONTROL SAMPLES

Field QC samples will be collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples for this project may include field duplicates and equipment rinsates. Field QC samples will not be collected for waste characterization samples.

5.3.1 Field Duplicates

Field duplicates consist of two distinct samples (an original and a duplicate) of the same matrix collected at the same time and location to the extent possible and using the same sampling techniques. The field duplicate data are used to evaluate the precision of the overall sample collection and analysis processes. Field duplicates will be collected at a frequency of one per every ten samples and will be analyzed for the same analytes as the original sample. Field duplicates are uniquely identified so that the identities of the field duplicates are "blind" to the analytical laboratory. Exact locations of field duplicate samples and their identifications will be recorded in the field logbook.

5.3.2 Equipment Rinsate Samples

Equipment rinsate samples will be collected only if non-disposable sampling equipment is used. Rinsate samples consist of organic-free, reagent-grade water collected from the final rinse of the equipment decontamination process. Rinsate samples will be collected from the sampling equipment, placed in appropriate pre-cleaned containers supplied by the analytical laboratory, and analyzed for the same analytes as the field samples under the same analytical conditions. Equipment rinsate samples, collected at a frequency of one per each sampling day, will help determine the effectiveness of the decontamination procedure and potential for cross-contamination during sampling events. This project will use disposable sampling equipment, where possible, eliminating the need for equipment rinsate samples.

6.0 FIELD METHODS AND SAMPLING PROCEDURES

The following sections present sampling procedures and sample handling procedures to be used for this project.

6.1 CONFIRMATION SOIL SAMPLING PROCEDURES

The following steps summarize the sampling procedures to be performed for floor and sidewall samples.

1. The floor of the excavation will be divided into 10-foot-by-10-foot grids. The sidewalls of the excavation will be divided into 10-foot linear sections.
2. A random-number generator will be used to determine x and y coordinates for each floor grid cell or sidewall section. The x and y coordinate will represent the sample location for that grid cell or section.
3. Sampling personnel will don a new pair of disposable nitrile gloves immediately before collecting soil samples at each location.
4. Grab soil samples will be collected using the sample jar to scoop the soil into the jar. Sample jars will be filled completely to ensure no headspace in the container.
5. Sample jars will be immediately labeled and packaged in accordance with Sections 6.5 and 6.6 of this SAP.
6. The sample number, date, time, and description of the sample will be recorded on the chain-of-custody (COC) form and in the field logbook as described in Section 6.7 of this SAP. All entries will be written in indelible black ink.

6.2 WASTE CHARACTERIZATION PROCEDURES

Stockpile samples and wastewater samples will be collected as described below.

6.2.1 Stockpile Sampling Procedures

One composite soil sample will be collected from approximately each 125 cubic yards of excavated soil. Stockpile sampling will be performed as follows.

1. The volume (in cubic yards) of the stockpiles will be calculated using the following formulas:

$$V = A * H/27$$

Where: V = volume in cubic yards

A = Area of the base of the stockpile in square feet calculated using one of the following formulas:

Rectangular = length * width
Square = length * width
Triangular = ½ base * height
Circular = 3.14 * radius * radius
Oval = 3.14 * long radius * short radius

H = average height of the stockpile in feet

27 = conversion factor for cubic feet to cubic yards

2. The stockpile will be divided into the number of sections equivalent to the number of samples to be collected.
3. For each section, five x, y, and z coordinates will be generated using a random-number generator. These five coordinates will represent the locations to be sampled for each section.
4. Sampling personnel will don a new pair of disposable nitrile gloves immediately before collecting soil samples at each location.
5. A hand auger will be used to access each x, y, and z coordinate. Grab soil samples will be collected using the sample jar to scoop the soil into the jar. Sample jars will be filled completely to ensure no headspace in the container.
6. Sample jars will be immediately labeled and packaged in accordance with Section 6.5 and 6.6 of this SAP.
7. The sample number, date, time, and description of the sample will be recorded on the COC form and in the field logbook as described in Section 6.7 of this SAP. The five samples will have the same sample number and date; however, the sample time indicated on the COC will be the sample time for the first of five samples collected. These five samples will be composited by the laboratory (per instructions written on the COC). All entries will be written in indelible black ink.

6.2.2 Wastewater Sampling Procedures

1. One water sample will be collected from the storage tank.
2. Liquid samples will be collected using a disposable bailer. Samples will be transferred from the bailers to pre-preserved, pre-cleaned sample containers using a bottom-emptying device.
3. Containers will be immediately labeled and packaged in accordance with Section 6.5 and 6.6 of this SAP.
4. The sample number, date, time, and description of the sample will be recorded on the COC form and in the field logbook as described in Section 6.7 of this SAP. All entries will be written in indelible black ink.

6.3 DECONTAMINATION PROCEDURES

Decontamination of non-disposable sampling equipment will be performed to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. All sampling equipment will be decontaminated by steam cleaning or by washing with a nonphosphate detergent, such as Liquinox™, or equivalent. Decontamination water will be collected in an on site storage tank.

The steps below will be followed for decontamination of the non-disposable sample equipment:

1. **Wash with nonphosphate detergent and water solution**—This step will remove all visible contamination from the equipment. A suitable size bucket filled with cleaning solution and a long-handled brush is suggested for this step. Dilute nonphosphate detergent as directed by the manufacturer.
2. **Rinse with potable water**—This step will rinse all the detergent solution away from equipment. A suitable size bucket filled with water and a long-handled brush is suggested for this step. Periodic changing of this water is required.
3. **Rinse with deionized water**—This step will rinse any detergent solution and potable water residues. Rinsing is most effective when water is applied using a stainless steel Hudson-type sprayer or Nalgene® squeeze bottle while holding equipment over a suitable size bucket.
4. **Rinse with deionized water**—This step will rinse any detergent solution and potable water residues. Rinsing is most effective when water is applied using a stainless steel Hudson-type sprayer or Nalgene squeeze bottle while holding equipment over a suitable size bucket.

6.4 SAMPLE NUMBER

All samples submitted to an analytical laboratory will be uniquely numbered according to the following format:

0023-IR73-YYY

where 0023 is the four-digit CTO number, IR73 is the site name, and YYY is a sequential number for this project. The sample number will be recorded in the field logbook and on the labels and COC form at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in a field logbook and referenced using the unique sample identification number.

6.5 SAMPLE LABELING

Sample labels are necessary to prevent misidentification of samples. Sample labels will be filled out in indelible black ink and affixed to sample containers at the time of sample collection. Each

sample label will be covered with clear tape. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Sampler's initials
- Analyses required
- Preservative (if any)

6.6 SAMPLE PACKAGING AND SHIPMENT

Immediately after sample labeling, custody seals will be affixed to each sample container. Each container will be placed in double-resealable plastic bags to protect the sample from moisture and to prevent breakage and potential cross-contamination during transportation to the laboratory. All glass sample containers will be protected with bubble wrap if transported by a commercial carrier.

Each cooler will be shipped with a temperature blank. A temperature blank is a vial filled with tap water and stored in the cooler during sample collection and transportation. The temperature of the cooler will be recorded by the laboratory on the COC form immediately upon receipt of the samples.

Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

Samples transported by a laboratory-assigned courier will be packed in a sample cooler with sufficient ice to keep the samples cooled at 4±2 degrees Celsius (°C). Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. Clear tape will be applied to the custody seals to prevent accidental breakage during transport. The COC form will be completed and signed by the courier. The cooler and the top two copies (white and pink) of the COC form will then be released to the courier for transportation to the laboratory.

Samples to be shipped by commercial carrier will be packed in a sample cooler lined with a plastic bag. Double-bagged ice will be added to the cooler in a sufficient quantity to keep the samples cooled to 4±2°C for the duration of the shipment to the laboratory. Saturday deliveries must be coordinated with the laboratory, and the airbill and cooler must be marked appropriately. The COC form will include the airbill number in the "transfers accepted by" column, and the top two copies of the COC form will be sealed in a double-resealable bag. The COC form will then be taped to the inside of the sample cooler lid. Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. Clear tape will be applied to the custody seals

to prevent accidental breakage during shipping. The cooler will be taped shut with strapping tape. The samples will then be shipped to the analytical laboratory. A copy of the courier airbill will be retained for documentation.

6.7 FIELD SAMPLE CUSTODY AND DOCUMENTATION

The integrity and traceability of samples from the time they are collected through the time data are reported are essential in any sampling and analysis program. The handling of the samples and transferring of custody must be well documented given the evidentiary nature of the analytical data. A sample is considered to be in one's custody if it meets any of the following criteria:

1. In actual possession or in view of the person who collected the sample
2. Locked in a secure area
3. Placed in an area restricted to authorized personnel

In order to maintain the integrity and traceability of samples, all information pertinent to field sampling will be recorded in a field logbook. All samples will be properly labeled and custody sealed prior to being transported to the laboratory and will be accompanied by completed COC documentation. All documentation will be recorded in a field logbook in black indelible ink.

6.7.1 Field Chain-of-Custody Procedure

To establish the documentation necessary to trace sample possession from the time of collection through analysis and disposal, a COC record will be completely filled out and will accompany every sample. Samples will be delivered to the laboratory for analysis as soon as practicable.

At a minimum, the following items will be recorded on the COC form:

- Project name
- Project/site location
- Project number (FWENC)
- Purchase order number
- Sample ID
- Sampler name
- Sampler signature
- Project contact
- Airbill number (if applicable)
- Date (of sample collection)
- Time (of sample collection to the nearest minute, 24-hour clock)

- Sample type (matrix)
- Turnaround time
- Sample location codes:

  Examples:

confirmation samples:	*Grid number*-FLOOR
	Grid number-SIDEWALL
stockpile samples:	STOCKPILE
equipment rinsate:	EQ RINSATE

- Sample depth in feet (start, end)
- QC type:

  REG. regular sample
  FD: field duplicate
  ER: equipment rinsate

- Composite description (if applicable)
- Laboratory name
- Number of sample containers
- Laboratory ID
- Analyses required
- Comments
  - Matrix spike/matrix spike duplicate (MS/MSD) samples
  - Observations specific to samples
- Transfer signature (to relinquish samples)
  - The sampler will be the first person to relinquish sample possession
- Courier/laboratory representative signature (for commercial carrier, record airbill number here)
- Date/time (of custody transfer)
- Laboratory instructions
- Data package requirement (Level III or IV)

6.7.2 Custody Seals

Sample custody seals are used to detect unauthorized tampering of samples from the time of sample collection to the time of analysis. The seals will be signed or initialed and dated by the sampler. The seals will be placed on the sample containers and shipping containers in such a way that they must be broken in order to open the containers. Seals will be affixed to containers before the samples leave the custody of the sampling personnel.

6.7.3 Field Logbooks

A permanently bound field logbook with consecutively numbered pages, used for sampling activities only, will be assigned to this project. All entries will be recorded in indelible black ink. At the end of each workday, the logbook pages will be signed by the responsible sampler and any unused portions of the 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, type of analyses, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the sample integrity

6.7.4 Document Corrections

Changes or corrections on any project documentation will be made by crossing out the erroneous item with a single line and initialing (by the person performing the correction) and dating the correction. The original item, although erroneous, must remain legible beneath the cross-out line. The new information should be written clearly above the crossed-out item.

7.0 QUALITY ASSURANCE OBJECTIVES

The overall quality assurance objectives of this SAP are to outline procedures for the collection and assessment of data that are within acceptable ranges of precision, accuracy, representativeness, completeness, and comparability (PARCC) to meet the project DQOs. The DQOs associated with environmental data are a function of the sampling plan rationale and the procedures used to collect the samples, as well as the analytical methods and instrumentation used. However, uncertainty cannot be eliminated entirely from environmental data.

7.1 DATA QUALITY OBJECTIVES

The DQO process is a seven-step planning approach based on scientific methods that are designed to ensure that the type, quantity, and quality of environmental data used for decision-making are appropriate for the intended application. The DQO process, as defined by the EPA, consists of the following seven steps that are designed to provide a systematic approach to resolving issues that pertain to this remediation project (EPA, 2000):

- Stating the Problem
- Identifying the Decisions
- Identifying Inputs to the Decisions
- Defining the Boundaries
- Developing a Decision Rule
- Specifying Limits on the Decision Error
- Optimizing Sampling Design

Table A.7-1 provides a step-by-step summary of the DQO process for this project.

7.2 ANALYTICAL DATA QUALITY OBJECTIVES

Analytical data will be obtained using published, standard methods in a state of California Department of Health Services (DHS)-certified and Naval Facilities Engineering Service Center (NFESC)-evaluated laboratory. Analytical DQOs will be assessed through measures of PARCC parameters. The analytical methods used, project-required reporting limits (RLs), and project QC criteria are also detailed in this document.

7.2.1 Quality Control Criteria

QC criteria definitions are as follows:

- **Precision**—A measure of the reproducibility of a set of replicate results or the agreement among repeat observations made under the same conditions. Analytical precision is the measurement of the variability associated with duplicate or replicate analyses. For this project, a laboratory control sample (LCS) will be used to determine the precision of the analytical method. Total precision is the measurement of the variability associated with the entire sampling and analysis process. It is determined by analysis of duplicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate and MSD samples will be used to assess field and analytical precision, and the precision measurement will be determined using the relative percent difference (RPD) between the duplicate sample results. The formula for calculating the RPD is as follows:

  RPD = 100 x 2 x (result - duplicate result)/(result + duplicate result)

- **Accuracy**—The nearness of a result or the mean of a set of results to the true or accepted value. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into a LCS against a control limit. Surrogate compound recoveries are also used to assess accuracy and method performance for each sample analyzed. The formula for calculating accuracy uses the following equation to determine percent recovery (%R) of specific analytes.

  %R = 100 x (spiked sample result - unspiked sample result)/amount of spike added

- **Representativeness**—The degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter mostly concerned with the proper design of the sampling program.

- **Completeness**—The percentage of measurements made that are judged to be valid measurements. The completeness goal is to generate a sufficient amount of valid data to meet project needs. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not qualified with a rejected ("R") flag. The requirement of completeness is 95 percent for aqueous samples and 90 percent for soil samples and is determined using the following equation:

  % completeness = 100 x (number of valid analyte results/number of possible results)

- **Comparability**—A qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurements for similar samples and sample conditions. The objective for the QA/QC program is to produce data with the greatest possible degree of comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is

achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions, and using standard and comprehensive reporting formats.

7.2.2 Project Reporting Limits

The RLs established for this project are presented in Table A.7-2.

7.2.3 Project Quality Control Limits

The precision and accuracy QC limits for each method are presented in Table A.7-3.

8.0 ANALYTICAL QUALITY CONTROL PROCEDURES

This section describes laboratory qualification, sample custody and documentation, QC procedures, QC samples, preventative maintenance, data review, and deliverables.

8.1 LABORATORY QUALIFICATION

The analytical laboratories selected to analyze samples for this project will be certified by the California DHS through the Environmental Laboratory Accreditation Program for all of the analytical methods required for the project. In addition, the laboratory must successfully complete the NFESC Laboratory Evaluation Program prior to sampling activities and maintain current status throughout the duration of the project.

The laboratory selected for the project must be capable of providing the required turnaround times, project QC, and data deliverables required by this SAP.

8.2 LABORATORY SAMPLE CUSTODY AND DOCUMENTATION

The samples will be delivered to the person in the laboratory authorized to receive samples (referred to as the sample custodian). Upon receipt of a sample, the sample custodian will inspect the condition of the sample (including the temperature of the cooler) and the custody seal, reconcile the information on the sample label against that on the COC record, assign a unique laboratory tracking number, log the sample in the laboratory logbook, and store the sample in a secured sample storage room.

The FWENC Project Chemist will be informed immediately of any inconsistencies between the COC form and the sample containers received. Any deviations from accepted sample handling procedures will be documented, and the FWENC Project Chemist will be informed.

8.2.1 Corrections to Custody Documentation

Changes or corrections on any project documentation will be made by crossing out the erroneous item with a single line and initialing (by the person performing the correction) and dating the correction. The original item, although erroneous, must remain legible beneath the cross-out line. The new information will be written above the crossed-out item. Corrections must be written clearly and legibly with indelible black ink.

8.3 LABORATORY QUALITY CONTROL PROCEDURES

The analytical laboratory must have written standard operating procedures (SOPs) defining the instrumentation, instrumentation maintenance, tuning, calibration, method detection and RLs, QC requirements, blank requirements, and step-by-step procedures for each analytical method.

The SOPs must be available to the analysts performing the work. The SOPs must meet or exceed the requirements of the analytical methods cited in this SAP and in the *DoD Quality Systems Manual for Environmental Laboratories* (U.S. Department of Defense [DoD], 2000). The laboratory must maintain logs of all activities that have an impact on the quality of the laboratory results.

Any portion of the method that is subcontracted by the laboratory to another laboratory or sent to another facility of the same network of laboratories must have the prior approval of the FWENC Project Chemist.

The laboratory must maintain the instruments in working condition required by the methods specified for the analyses. Sufficient redundancy in equipment must be available in the laboratory to handle downtime situations.

Method substitution because of instrumental failure will not be permitted without written approval from the FWENC Project Chemist.

8.4 LABORATORY QUALITY CONTROL SAMPLES

The following subsections describe in detail the laboratory QC sample evaluation required for this project.

8.4.1 Calibration

All instruments and equipment must be calibrated in accordance with the specified methods unless different instructions are included in this document. Each instrument must be calibrated with the standard solutions appropriate to the type of instrument and the calibration range established for the method.

Initial calibrations are performed when the method is first used and again whenever the continuing calibrations fail to meet their respective acceptance criteria. In addition, if the instrument undergoes significant maintenance, the initial calibration must be repeated.

Continuing calibrations verify that the instrument performance has remained within the limits set at the time of the initial calibration. The frequency of continuing calibrations is specified in referenced methods.

8.4.2 Instrument/Calibration Blanks

Instrument blanks are analyzed to verify that analytes from previous runs are out of the system and do not contaminate succeeding runs. Instrument blanks must be analyzed following calibration runs, before sample analyses are performed, and after samples containing high concentrations of potentially interfering materials are found.

Target analytes must not appear in the instrument blanks at concentrations greater than half the required RLs. If the laboratory consistently observes contaminants in the instrument blanks, the laboratory must investigate the source of the contamination and eliminate it, if possible.

8.4.3 Method Blanks

Method blanks are prepared in the same manner as the samples, using the same reagents and glassware used for samples. The purpose of the method blank is to ensure that the equipment and reagents used in preparing the samples are free of contaminants that could interfere with the analysis. The method blank must be prepared and analyzed for each batch of 20 project samples or less per matrix (aqueous and solid) type.

The method blank must not exhibit analytes at concentrations greater than half the required RLs. If contaminants are found that either contribute to the apparent concentration of a particular target analyte or interfere with the analysis, the analysis must be stopped, the source of contamination identified and corrected, and the analysis repeated. Contamination in the method blank above half the RLs will require that the entire associated batch of extracts or digestates be reprepared and reanalyzed. Hence, it is very important to make sure that no such contamination is present.

8.4.4 Laboratory Control Samples

LCSs are purchased samples containing known concentrations of specific target analytes. LCSs can also be prepared by spiking known amounts of target analytes into a well-characterized blank matrix. The matrix will be organic-free, laboratory reagent-grade water for water samples and clean sand or equivalent for soil samples.

The LCS is prepared and run at a frequency of one per 20 project samples per matrix with the associated samples, using the same reagents and volumes. All analytes in the LCS must meet recovery criteria provided in Table A.7-3. If the criteria are not met, the entire batch of samples must be reprepared, together with a new LCS, and reanalyzed.

8.4.5 Matrix Spike and Matrix Spike Duplicate

The MS/MSD serves to determine whether matrix effects are affecting recoveries. For inorganic analyses, only a single MS is performed per batch. A MS/MSD is prepared by spiking a known amount of solution to two aliquots of a sample being analyzed in a batch. Once the spike is added to the MS/MSD samples, these samples are carried through the entire sample preparation process along with the other samples in the batch. The MS/MSD recoveries are compared against each other and against the known amount of the spike. From this data, both accuracy and precision can be determined. All analytes in the MS/MSD must meet %R and RPD criteria provided in Table A.7-3.

The laboratory will perform a MS/MSD at a frequency of one per 20 project samples per matrix type. To prepare a project-specific MS/MSD, field personnel will collect additional sample volumes at a frequency of one per 20 soil samples. Field personnel will designate samples for MS/MSD analysis on the COC form.

8.4.6 Duplicates

Two types of duplicates, field and laboratory, will be performed. Field duplicates are two samples that are duplicates of each other. Field duplicates for soil samples will be collected. However, due to the inhomogeneity of soil matrix, results will be used to determine sampling variability rather than sampling precision. The purpose of field duplicates is to measure the consistency of field sampling. The field duplicate is treated the same as the other field samples and identification is withheld from the laboratory. Field duplicates will be collected at a frequency of one for every ten samples per matrix. Field duplicates will not be applicable to the collection of waste characterization samples.

The laboratory duplicate is created by the laboratory, where two aliquots are intentionally taken from the same sample and analyzed in parallel. This analysis serves to measure the precision of laboratory operations. Laboratory duplicate analyses will be applied only for inorganic analyses at a frequency of one per 20 project samples.

8.5 PREVENTIVE MAINTENANCE

All instruments must be maintained in accordance with the manufacturers' recommended procedures. The laboratory must define in its QA plan the frequency and type of maintenance for each instrument. The laboratory must also record all maintenance activities in an instrument logbook.

In addition to preventive maintenance, the laboratory must keep a sufficient supply of replacement parts on hand for those parts known to require frequent changes due to wear and tear or contamination.

Whenever preventive or corrective maintenance is applied to an instrument, the laboratory must demonstrate the instrument's return to operating conditions and must recalibrate the instrument prior to resuming sample analyses.

8.6 DATA REVIEW

All data reported by the laboratory must be reviewed in accordance with the SOPs and as described in the following subsections.

8.6.1 Analyst Review

Each analyst that generates a data set is responsible for ensuring that 100 percent of the data comply with the method- and project-specific requirements and that any deviations or failure to meet criteria are documented for the project file.

8.6.2 Peer Review

One hundred percent of all data sets must be reviewed by an independent peer analyst. Peer reviews must be performed by an analyst that is qualified to perform the subject analytical method. The peer review must be comprehensive and include the following:

- Check 100 percent of manual entries for transcription errors
- Check 100 percent of manual calculations for accuracy
- Spot-check computer calculations to verify program validity
- Check for compliance with method- and project-specific QC requirements
- Check for completeness of raw data or supporting materials
- Confirm spectral assignments
- Check descriptions of deviations from method or project requirements
- Check for appropriate use of significant figures and rounding
- Check reported values for dilutions
- Evaluate reasonableness of results

8.6.3 Technical Reviews

Technical reviews by the responsible supervisor or designated alternate must be performed on 100 percent of reported data. The same individual may not perform peer and technical reviews on the same data set. The technical review must include the following:

- Check for compliance with method- and project-specific requirements
- Check the completeness of the reported information
- Check the information in the report narrative
- Evaluate the reasonableness of the results

If the responsible supervisor is the only qualified peer reviewer for a method, the requirement for the technical review is waived.

8.6.4 Management Review

One hundred percent of all data must receive management approval prior to release. The scope and content of management's review is at the laboratory's discretion. Authority to release data may be delegated to a technical supervisor or other party, if the term of the delegated authority is documented in the QA program file.

8.6.5 Quality Assurance Review

QA reviews of data from each section of the laboratory must be conducted on a routine basis. Annually, at least 10 percent of data reports generated using each analytical method must be reviewed by a member of the QA staff. The QA reviews must include the following:

- Check for compliance with required QC procedures
- Check for compliance with approved SOPs
- Check for compliance with method and project requirements

QA data reviews may be conducted after the subject data have been reported to FWENC.

8.7 DELIVERABLES

The following sections describe the deliverable documents that will be submitted to FWENC by the analytical laboratory.

8.7.1 Hard-Copy Deliverables

Two copies of the hard-copy data will be submitted to FWENC by the laboratory. The report pages will be sequentially numbered. The report will contain a table of contents referencing individual sections in the data package, original COC forms, sample receipt forms, analytical data, and a case narrative documenting the resolution of all corrective actions and nonconformances encountered during analysis. All FWENC samples will be cross-referenced to the associated batch QC samples. When revisions to data reports are required, the revised pages will be stamped with the notation "amended or revised report". To allow third-party validation, two types of data packages will be required. They will be referred to as EPA Level III or IV packages.

For this project, FWENC will request that 90 percent of the data be submitted in an EPA, Level III-equivalent data package and 10 percent submitted in an EPA Level IV-equivalent data package. All data packages will be assembled (as applicable) in the following sequence:

- Cover page (with laboratory service identification number, FWENC project name, and FWENC project number)
- Original white copy of COC forms (including cooler temperature and sample condition)
- Sample receipt forms
- Cross-reference table
- Case narrative

- Inorganic raw data sequence (by metal analyte):
  - Sample result forms, including method blanks
  - Sample raw data (EPA Level IV only)
  - QC data summaries
  - Initial calibration
  - Daily calibration checks, including all bracketing continuing calibration verification
  - Calibration blanks, including all bracketing continuing calibration blanks
  - Interference check standards A and B for inductively coupled plasma-atomic emission spectroscopy (ICP-AES) only
  - Detection limit check standard (graphite furnace atomic absorption only)
  - QC raw data (EPA Level IV only)
  - Post-digestion spike results
  - Analytical spike results
  - Method of standard additions
  - ICP-AES serial dilutions
  - Instrument run log
  - Sample preparation log

8.7.2 Electronic Deliverables

The electronic data deliverable (EDD) will be in ASCII format. This will be compatible with the Navy Environmental Data Transfer Standard. The laboratory will verify that the EDD and the hard-copy reports are identical. Both the EDD and the hard-copy report will present results to two or three significant figures. For inorganic results, two significant figures will be used for results less than ten, and three significant figures will be used for results greater than ten. For organic results, two significant figures will be used for all results. Results for QC analyses (method blanks, MS/MSD, LCS, and duplicates) will be reported up to three significant figures. The EDD for each sample delivery group is due at the same time as the hard-copy report, 21 calendar days after the last sample of the sample delivery group has been delivered to the laboratory.

9.0 DATA QUALITY MANAGEMENT

9.1 DATA MANAGEMENT

The following sections describe the requirements for the management of hard-copy data and electronic data.

9.1.1 Hard-Copy Report

All relevant raw data and documentation, including, but not limited to, logbooks, data sheets, electronic files, and final reports, will be maintained by the laboratory for at least 7 years. FWENC will be notified 30 days before disposal of any relevant laboratory records.

FWENC will maintain copies of all COC forms. Laboratory reports will be logged in upon receipt and filed in chronological order. The second copy of the report will be sent for third-party data validation.

9.1.2 Electronic Data

Field information (date and time collected, sample identification, and so forth) will be entered directly into the main database from the COC form or uploaded from electronic files generated in the field.

Upon receipt by the FWENC Data Manager, electronic data will be uploaded into a Microsoft Access database. The uploaded data will be processed to compare the fields against a list of required values. If any errors are returned by the program, the file will be manually edited or regenerated by the laboratory. The laboratory database will be merged with the field database, and reports will be generated from the merged database.

9.2 DATA VALIDATION

All sample data, with the exception of waste characterization samples, will be validated by an independent data validation company. Data will be validated at 90 percent EPA Level III and 10 percent EPA Level IV. The validation will be in accordance with the QC criteria specified in the referenced methods and in this SAP, and flagging guidelines per the Contract Laboratory Program *National Functional Guidelines for Inorganic Data Review, EPA 540/R-94-013* (EPA, 1994) and *Environmental Work Instruction (EWI) #1, 3EN2.1, Chemical Data Validation* (SWDIV, 2001a). Data not meeting the criteria in this SAP and/or the analytical methods will be flagged as estimated ("J") or rejected ("R"). Functional guidelines will only be followed for data validation qualifiers.

The data validation company will have the following qualifications:

1. A minimum of 5 years of experience in the environmental data validation business
2. Prior experience on DON RAC or Comprehensive Long-Term Environmental Action projects
3. DON data validation experience
4. Active peer review program

Personnel must have the following qualifications:

1. Data Reviewer:
   - Bachelor of science degree or higher in chemistry or a physical science
   - 5 years of combined experience with approximately 2 years in data validation and 3 years conducting laboratory analysis in an environmental laboratory using the EPA-approved methods being validated
2. Peer Reviewer:
   - Bachelor of science degree or higher in chemistry or a physical science
   - 5 years of combined experience with approximately 2 years in data validation and 3 years conducting laboratory analysis in an environmental laboratory using the EPA-approved methods being validated

9.3 DATA EVALUATION

After data validation, data will be further evaluated by the FWENC Project Chemist. In the process of evaluating the data, the Project Chemist will determine which of the advisory data qualifiers provided by the independent data validator will be retained or deleted. The evaluation of data will be based on the requirements set forth in this SAP for QC samples, the level of contamination of samples indicated by the method blanks analysis, and the overall indication of interference due to contamination. The following data qualifiers will be used in the report:

J - Result is estimated
U - Analyte is not detected at or above the stated RL
R - Data are rejected
UJ - Analyte is not detected, but there is an uncertainty about the RL

Data qualifying will be used to alert end users to uncertainties associated with the data. The evaluation flags will be entered into a special field in the electronic database. Thus, when data processing is complete, the data for each analyte will have the flag designated by the laboratory and the flag designated by the evaluator, as appropriate.

10.0 QUALITY ASSURANCE OVERSIGHT

QA oversight for this project will include system audits of field activities and of the laboratory subcontracted by the DON to perform the analysis.

10.1 FIELD AUDITS

The FWENC and SWDIV QA Officers may schedule audits of field activities at any time to evaluate the execution of sample collection, identification, and control in the field. The audit will also include observations of COC procedures, field documentation, instrument calibrations, and field measurements.

Field documents and COC forms will be reviewed to ensure that all entries are printed or written in indelible black ink, dated, and signed.

Sampling operations will be reviewed and compared to this SAP and other applicable SOPs. The auditor will verify that the proper sample containers are used, the preservatives are added or are already present in the container, and the documentation of the sampling operation is adequate.

Field measurements will be reviewed by random spot-checking to determine that the instrument is within calibration, the calibration is done at the appropriate frequency, and that the sensitivity range of the instrument is appropriate for the project.

10.1.1 Corrective Action

Nonconformance identified during the field audit will be recorded on a Nonconformance Report. All nonconformance and corrective actions will be processed in accordance with FWENC Procedure QC-3. This procedure is presented in Attachment 5 of the *Final Contractor Quality Control Program Plan* (FWENC, 1999).

The QC Program Manager will monitor corrective action documentation, verify implementation of the corrective action, track and analyze the corrective action, and closeout corrective action documentation upon completion of the corrective action.

10.2 LABORATORY AUDITS

Laboratories selected to perform the analyses are required to have successful completion of the NFESC laboratory evaluation process throughout the project. This process consists of a laboratory QA plan review, performance evaluation samples, a data package review, and an on-site audit. Because of this requirement, FWENC will not perform an on-site audit or visit unless it is deemed necessary.

Laboratory oversight by FWENC will include a thorough review of the preliminary report and hard-copy data packages. The information that may be obtained from the data packages consists of the following:

- Correctness of COC procedures
- Adherence to method holding times
- Project RLs
- Spiking levels, frequency, and recovery
- Accuracy of analytical methods through the LCSs and surrogates

10.2.1 Corrective Action

The laboratory will have a corrective action program that addresses all out-of-control situations. Following completion of analyses, laboratory personnel will verify compliance with the minimum QC requirements of the project and the laboratory QA/QC plan. If any of the parameters fall outside the control limits, corrective action will be implemented.

Initial corrective action is to verify that no obvious calculation errors have occurred. If appropriate, reanalysis will be performed. If the reanalysis confirms the initial out-of-control limits result, the chemist will notify the laboratory supervisor, who will initiate the corrective action process. Corrective actions may include, but are not limited to, the following:

- Verification of dilution factors
- Examination of sample for nonhomogeneity
- Verification of sample preparation
- Checking of standard preparation logbook
- Verification of instrument performance
- Checking of reagent water purity
- Monitoring chemist's method performance for procedure verification

Notification and prompt involvement of the FWENC Project Chemist in the corrective action process are absolutely necessary in determining an appropriate resolution. Corrective action records will document all steps taken in the corrective action process, beginning with a description of the problem and ending with a final resolution. A copy of the corrective action report will be sent to the FWENC Project Chemist immediately and will be maintained in the project files at FWENC.

All corrective action reports will be maintained by the laboratory in a project file and delivered to FWENC as part of the hard-copy deliverable.

11.0 SAP REVISION OR AMENDMENT

When circumstances arise that impact the original project DQOs, such as a significant change in work scope, this SAP will be revised or amended. The modification process will be based on EPA guidelines, direction from the DON and QA Officer, and in conjunction with *Environmental Work Instruction (EWI) #2, 3EN2.2, Review, Approval, Revision, and Amendment of Sampling and Analysis Plans (SAPs)* (SWDIV, 2001b).

12.0 REFERENCES

Bechtel National, Inc. (BNI). 2002. *Final Engineering Evaluation/Cost Analysis, Installation Restoration Site 73, Naval Weapons Station, Seal Beach, California.* March.

CH2M Hill. 2002. *Final Focused Site Inspection Phase II Report, Naval Weapons Station, Seal Beach, California.* Volumes 1 and 2. 4 April.

Foster Wheeler Environmental Corporation (FWENC). 1999. *Final Contractor Quality Control Program Plan.*

Southwest Division Naval Facilities Engineering Command (SWDIV). 2001a. *Environmental Work Instruction (EWI) #1, 3EN2.1, Chemical Data Validation.* November.

_____. 2001b. *Environmental Work Instruction (EWI) #2, 3EN2.2, Review, Approval, Revision, and Amendment of Sampling and Analysis Plans (SAPs).* November.

U.S. Department of Defense (DoD). 2000. *DoD Quality Systems Manual for Environmental Laboratories.* October.

U.S. Environmental Protection Agency (EPA). 1986. *EPA Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846.* Third Edition and Final Updates.

_____ 1994. Contract Laboratory Program. *National Functional Guidelines for Inorganic Data Review; EPA 540/R-94-013.* February.

_____. 2000. *Guidance for the Data Quality Objectives Process, EPA QA/G-4, QAMS.* August.

_____. 2001. *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS.* March.

TABLES

TABLE A.3-1

PERSONNEL AND RESPONSIBILITIES

Key Position	Responsibility
SWDIV Quality Assurance Officer	• Provides governmental oversight of the FWENC QA Program • Provides quality related directives through Contracting Officer Representative • Provides technical and administrative oversight of FWENC surveillance audit activities • Point of contact for all matters concerning QA and the DON's Laboratory QA Program • Prepares governmental budget estimates for all QA functions included in FWENC contracts • Coordinates training on matters pertaining to generation and maintenance of quality of data • Authority to suspend project execution if QA requirements are not adequately followed
Project Chemist	• Develops sampling and analysis plan • Evaluates and selects qualified subcontract laboratories • Implements chemical data QC procedures and performs auditing of field performance • Reviews laboratory data prior to use • Coordinates data validation of laboratory data • Reviews data validation report • Prepares and supports report preparation
Remedial Project Manager	• Project management from client perspective • Fulfills scope of work • Oversees cost and schedule • Is lead interface with NAVWPNSTA Seal Beach
NAVWPNSTA IR Program Manager	• Ensuring that the field and remedial activities are in compliance with the applicable rules and regulations • Community relations
Project Manager	• Executes all phases of a specific project and efficiently applies the full resources of the FWENC RAC team • Manages all technical, quality, financial, and administrative aspects of the project • Identifies and completes documents appropriate to work assignments • Approves and maintains qualification records for all project personnel • Ensures and verifies that the project team completes all work tasks and QA/QC requirements of planning documents • Logs all variances to planning documents and ensures timely follow-

TABLE A.3-1

PERSONNEL AND RESPONSIBILITIES

Key Position	Responsibility
	up and approval by the DON
Resident Officer in Charge of Construction	• Oversees the technical and QC of the field activities • Coordination of field activities with different base departments and personnel

Notes:

DON	–	U.S. Department of the Navy
FWENC	–	Foster Wheeler Environmental Corporation
NAVWPNSTA	–	Naval Weapons Station
QA	–	Quality Assurance
QC	–	Quality Control
RAC	–	Remedial Action Contract
SWDIV	–	Southwest Division Naval Facilities Engineering Command

TABLE A.5-1

SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIME REQUIREMENTS

Analysis	Analytical Method	Container	Preservative	Holding Time
Soil				
Total Lead	EPA Method 6010B	One 8-ounce glass jar	Cool, 4±2°C	6 months
Title 22 Metals (including mercury)	EPA Method 6010B/7000	One 8-ounce glass jar	Cool, 4±2°C	6 months (except mercury which is 28 days)
STLC	WET	One 8-ounce glass jar	Cool, 4±2°C	6 months (except mercury which is 28 days)
TCLP	EPA Method 1311	One 8-ounce glass jar	Cool, 4±2°C	6 months (except mercury which is 28 days)
Water				
Title 22 Metals (including mercury)	EPA Method 6010B/7000	500-mL HDPE container	pH ≤ 2 w/ HNO_3	6 months (except mercury which is 28 days)

Notes:

°C – degrees Celsius
EPA – U.S. Environmental Protection Agency
HDPE – high-density polyethylene
HNO_3 – nitric acid
mL – milliliter
STLC – Soluble Threshold Limit Concentration
TCLP – Toxicity Characteristic Leaching Procedure
WET – Waste Extraction Test

TABLE A.7-1

SUMMARY OF DATA QUALITY OBJECTIVES

STEP 1 Statement of Problem	STEP 2 Decisions	STEP 3 Inputs to the Decisions	STEP 4 Boundaries of the Study	STEP 5 Decision Rules	STEP 6 Limits on Decision Errors	STEP 7 Optimize the Sampling Design
IRP Site 73 consists of a former water tower and approximately 6 acres of open land surrounding the tower The contaminant of concern is lead from sandblasting and painting of the water tower since its construction in 1944 The site requires soil excavation to ensure the removal of lead contamination To evaluate whether the extent of impacted soils have been removed confirmation samples will be collected	Do the results of total lead analysis for the confirmation soil samples fall above or below the TCG for lead which is 317 mg/kg?	Data from previous site investigations by CH2M Hill (CH2M Hill 2002) Summarized information on these activities is presented in Section 2 0 of the Work Plan Results of soil confirmation samples collected during the project	The approximate area and depth of excavation is 80 feet in length, 60 feet in width, and 50 feet by 50 feet square, and 2 0 to 3 5 feet deep A map detailing the areas to be excavated is presented in Figure A 4-1 Fieldwork is tentatively scheduled to begin in the latter part of 2002 Project closeout is tentatively scheduled for the end of 2002	If the confirmation samples contain total lead above the TCG, then soil excavation will continue, and confirmation samples will be recollected until total lead concentrations are below the TCG If the confirmation samples contain total lead concentrations below the TCG, then the soil remediation will be considered successful	For confirmation soil samples, the null hypothesis is that results are below cleanup goals False positive decision error: data indicates that the concentration of contaminants is above the cleanup goal and further excavation will be required False negative decision error: data indicates that the concentration of contaminants is below the cleanup goal and further excavation will not be required The consequences of making a false positive decision error would increase project costs associated with further excavation and additional volume of soil to be disposed The consequences of making a false negative decision error may increase exposure risk The latter error is considered more severe than the false positive decision error The decision error limit of zero will be set for both false positive and negative.	A confirmation soil sample will be collected from each 10-foot by 10-foot grid cell on the floor and from each 10-foot linear section along the sidewalls Total lead analyses will be performed on all of the confirmation samples Groundwater is at approximately 15 feet bgs; therefore, groundwater is not expected to be encountered during excavation activities

Notes:

bgs – below ground surface
IRP – Installation Restoration Program
mg/kg – milligrams per kilogram
TCG – target cleanup goal

TABLE A.7-2

PROJECT REPORTING LIMITS

Parameter/Method	Analyte	Soil			
		RL	Target Cleanup Goal[a]	TTLC Action Level[b]	Unit
Total Lead EPA Method /6010B	Lead	0.3	317	NA	mg/kg
Title 22 Metals EPA Method 6010B/7000	Antimony	5	NA	500	mg/kg
	Arsenic	0.3	NA	500	mg/kg
	Barium	1	NA	10000	mg/kg
	Beryllium	0.2	NA	75	mg/kg
	Cadmium	0.2	NA	100	mg/kg
	Chromium	0.5	NA	2500	mg/kg
	Cobalt	0.5	NA	8000	mg/kg
	Copper	0.5	NA	2500	mg/kg
	Lead	0.3	317	1000	mg/kg
	Mercury	0.2	NA	20	mg/kg
	Molybdenum	0.2	NA	3500	mg/kg
	Nickel	0.3	NA	2000	mg/kg
	Selenium	0.5	NA	100	mg/kg
	Silver	0.5	NA	500	mg/kg
	Thallium	0.5	NA	700	mg/kg
	Vanadium	0.5	NA	2400	mg/kg
	Zinc	0.5	NA	5000	mg/kg

TABLE A.7-2

PROJECT REPORTING LIMITS

Parameter/Method	Analyte	Water			
		RL	STLC Action Level[c]	TCLP Action Level[d]	Unit
Title 22 Metals EPA Method 6010B/7000	Antimony	5	15000	NE	µg/L
	Arsenic	0.3	5000	5000	µg/L
	Barium	1	100000	100000	µg/L
	Beryllium	0.2	750	NE	µg/L
	Cadmium	0.2	1000	1000	µg/L
	Chromium	0.5	5000	5000	µg/L
	Cobalt	0.5	80000	NE	µg/L
	Copper	0.5	25000	NE	µg/L
	Lead	0.3	5000	5000	µg/L
	Mercury	0.2	200	200	µg/L
	Molybdenum	0.2	350000	NE	µg/L
	Nickel	0.3	20000	NE	µg/L
	Selenium	0.5	1000	1000	µg/L
	Silver	0.5	5000	5000	µg/L
	Thallium	0.5	7000	NE	µg/L
	Vanadium	0.5	24000	NE	µg/L
	Zinc	0.5	250000	NE	µg/L

[a]– Target cleanup goal for lead was established based on the ecological risk assessment (BNI, 2002) and subsequent negotiations with regulatory agencies.

[b]– TTLC action level will be used only for soil stockpile samples collected for waste characterization purposes. TTLC values for are based on California Title 22 TTLCs. Soil stockpile samples above the TTLC limit will be classified as non-RCRA California hazardous waste.

[c]– STLC extraction and analysis will be performed only for soil stockpile samples that were greater than 10 times the STLC limit for each analyte. If the STLC result is above the listed action level, then the soil will be classified as a non-RCRA California hazardous waste.

[d]– TCLP extraction and analysis will be performed only for soil stockpile samples that were greater than 20 times the TCLP limit for each analyte. If the TCLP result is above the listed action level, then the soil will be classified as RCRA hazardous waste.

Notes:

EPA – U.S. Environmental Protection Agency
µg/L – micrograms per liter
mg/kg – milligrams per kilogram
NA – not applicable
NE – not established
RCRA – Resource Conservation Recovery Act
RL – reporting limit
STLC – soluble threshold limit concentration
TCLP – toxicity characteristic leaching procedure
TTLC – total threshold limit concentration

TABLE A.7-3

QUALITY CONTROL ACCEPTANCE CRITERIA

Method	Analyte	Accuracy Soil (%R)	Precision Soil (RPD)
EPA Method 6010B/7000	Antimony	75-125	≤ 30
	Arsenic	75-125	≤ 30
	Barium	75-125	≤ 30
	Beryllium	75-125	≤ 30
	Cadmium	75-125	≤ 30
	Chromium	75-125	≤ 30
	Cobalt	75-125	≤ 30
	Copper	75-125	≤ 30
	Lead	75-125	≤ 30
	Manganese	75-125	≤ 30
	Molybdenum	75-125	≤ 30
	Nickel	75-125	≤ 30
	Selenium	75-125	≤ 30
	Silver	75-125	≤ 30
	Thallium	75-125	≤ 30
	Vanadium	75-125	≤ 30
	Zinc	75-125	≤ 30

TABLE A.7-3

QUALITY CONTROL ACCEPTANCE CRITERIA

Method	Analyte	Accuracy Water (%R)	Precision Water (RPD)
EPA Method 6010B/7000	Antimony	75-125	≤ 30
	Arsenic	75-125	≤ 30
	Barium	75-125	≤ 30
	Beryllium	75-125	≤ 30
	Cadmium	75-125	≤ 30
	Chromium	75-125	≤ 30
	Cobalt	75-125	≤ 30
	Copper	75-125	≤ 30
	Lead	75-125	≤ 30
	Manganese	75-125	≤ 30
	Molybdenum	75-125	≤ 30
	Nickel	75-125	≤ 30
	Selenium	75-125	≤ 30
	Silver	75-125	≤ 30
	Thallium	75-125	≤ 30
	Vanadium	75-125	≤ 30
	Zinc	75-125	≤ 30

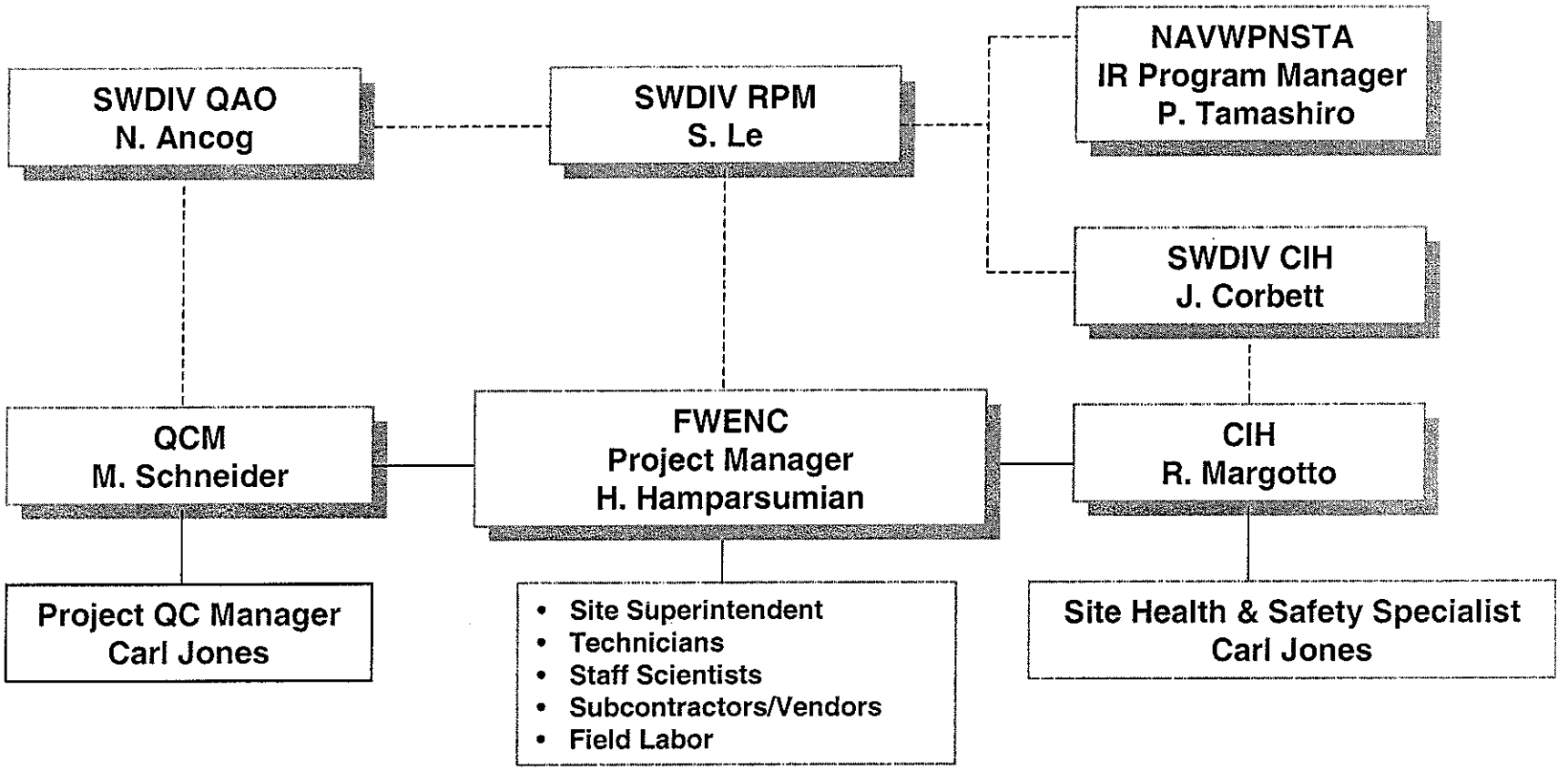
Notes:

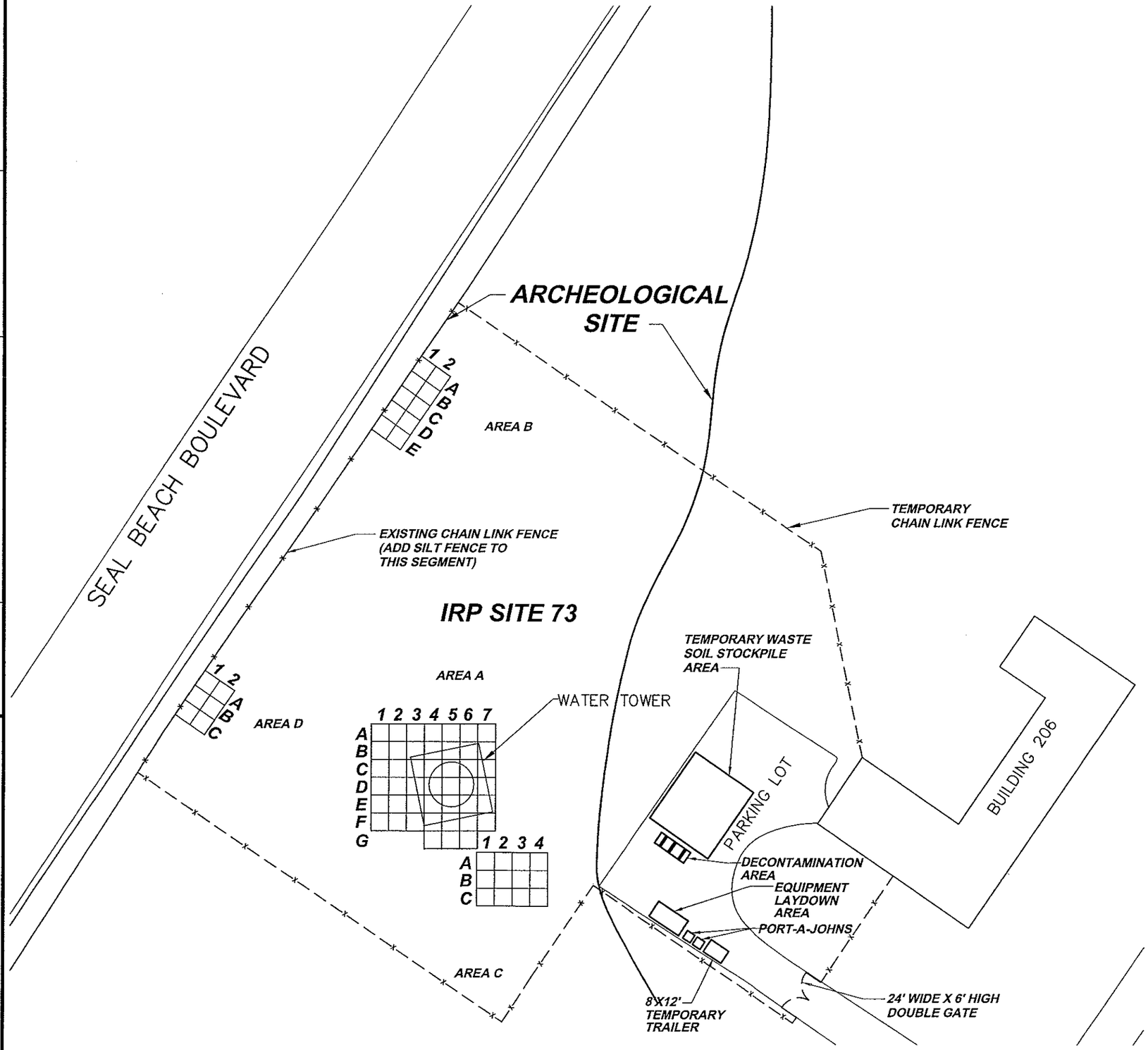
EPA – U.S. Environmental Protection Agency
%R – percent recovery
RPD – relative percent difference

FIGURES

Figure A.3-1

Project Organization Chart





LEGEND

- BUILDING
- ROAD
- CHAIN LINK FENCE

NOTES:

1. GRIDS E4, E5, E6, F4, F5, F6, G4, G5, & G6 EXCAVATED TO APPROX. 3.5 FEET BGS
2. ALL OTHER GRIDS WILL BE EXCAVATED TO APPROX. 2.0 FEET BGS

N

0 60 120

FEET

Figure A.4-1
IRP SITE 73
PROPOSED SITE LAYOUT AND VERIFICATION SAMPLING GRID

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER ENVIRONMENTAL CORPORATION

DRAWN BY: MD | CHECKED BY: MT | APPROVED BY: HH | DCN: FWSD-RAC-02-1413 | DRAWING NO: 02141341A.DWG

DATE: 10/01/02 | REV: REVISION 0 | CTO: #0023

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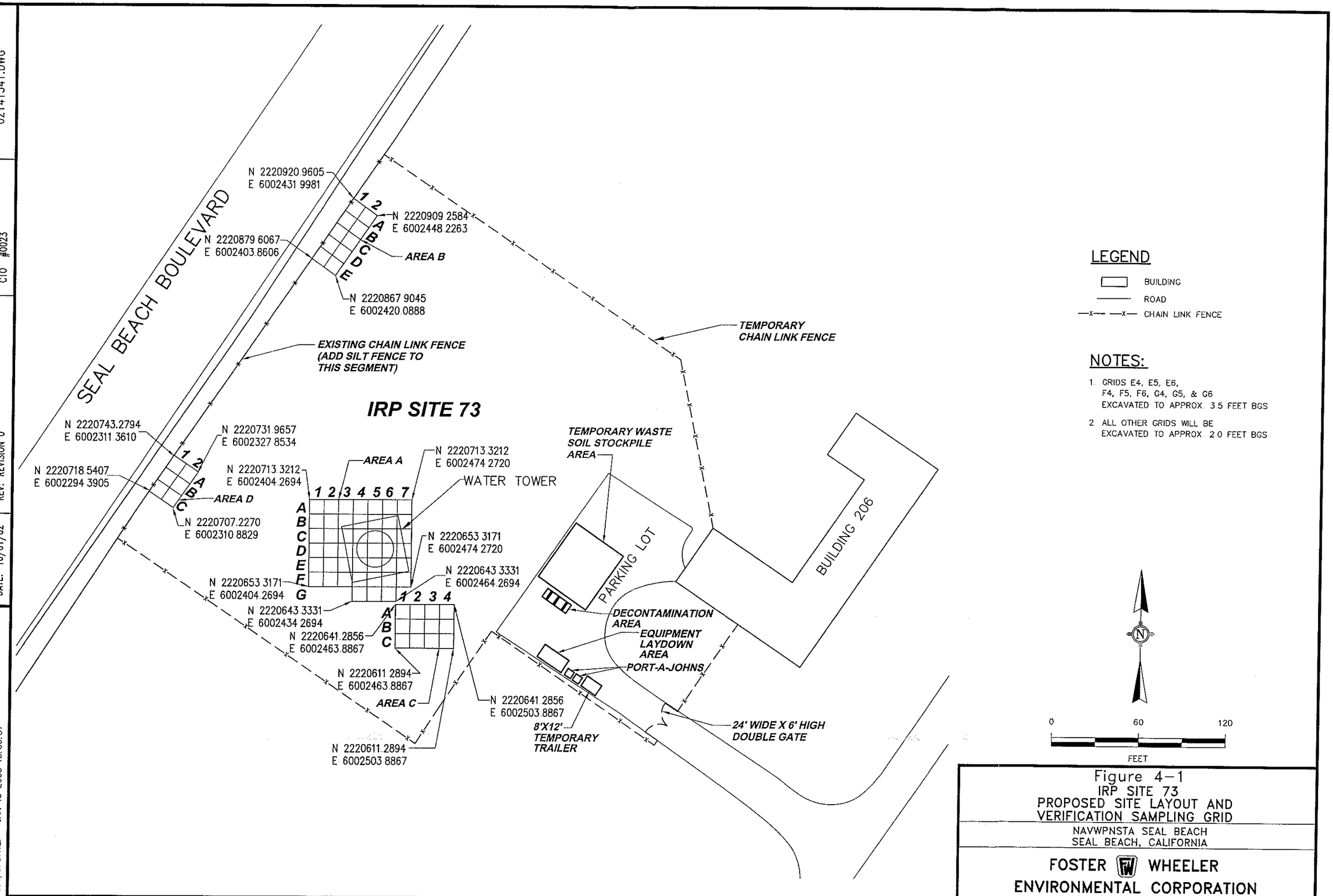

Figure 4-1
IRP SITE 73
PROPOSED SITE LAYOUT AND
VERIFICATION SAMPLING GRID

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

DRAWING NO: 02141341.DWG
DCN: FWSD-RAC-02-1413
CTO #0023
APPROVED BY: HH
CHECKED BY: MT
REV: REVISION 0
DRAWN BY: MD
DATE: 10/01/02

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PLOT/UPDATE: JAN 15 2003 15:06:57

APPENDIX B

PROJECT CONTRACTOR QUALITY CONTROL PLAN

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

CONTRACT NO. N68711-98-D-5713
CTO NO. 0023

APPENDIX B

FINAL

PROJECT CONTRACTOR QUALITY CONTROL PLAN

Revision 0
January 21, 2003

NON-TIME-CRITICAL REMOVAL ACTION
INSTALLATION RESTORATION PROGRAM SITE 73
(WATER TOWER AREA)
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1413

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 500
San Diego, CA 92101

Hamlet H. Hamparsumian
Project Manager

Mary Schneider
Quality Control Program Manager

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- Initial Phase Checklist
- Follow-up Phase Checklist
- Rework Items List
- Materials Inspection Checklist
- Completion Inspection Checklist
- Nonconformance Report
- Nonconformance Report Log
- Field Change Request
- Design Change Notice
- Photograph Log Sheet
- Request for Engineering Information
- Request for Information

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Figure B.2-1 Project Organization Chart

ABBREVIATIONS AND ACRONYMS

BRAC	Base Realignment and Closure
CAD	computer-assisted drafting
CQC	Contractor Quality Control
CQCR	Contractor Quality Control Report
CTO	Contract Task Order
DCN	Design Change Notice
DFW	definable feature of work
DON	Department of the Navy
ER,N	Environmental Restoration, Navy
FCR	Field Change Request
FWENC	Foster Wheeler Environmental Corporation
IR	Installation Restoration
IRP	Installation Restoration Program
NAVWPNSTA	Naval Weapons Station
NCR	Nonconformance Report
PJM	Project Manager
PQCM	Project Quality Control Manager
QA	Quality Assurance
QC	quality control
QCM	Quality Control Program Manager
RAC	Remedial Action Contract
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SD	submittal description
SDS	Spatial Data Standard
SHSP	Site-Specific Health and Safety Plan

ABBREVIATIONS AND ACRONYMS
(Continued)

SHSS	Site Health and Safety Specialist
SWDIV	Southwest Division Naval Facilities Engineering Command
USA	Underground Service Alert
USACE	United States Army Corp. of Engineer

1.0 INTRODUCTION

This Project Contractor Quality Control (CQC) Plan establishes the quality control (QC) procedures and methods to be implemented for the Soil Remediation Project at Installation Restoration Program (IRP) Site 73 located at the Naval Weapons Station (NAVWPNSTA) Seal Beach, California. The Project CQC Plan addresses the project CQC requirements for Contract Task Order (CTO) No. 0023 under the Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV) Remedial Action Contract (RAC) No. N68711-98-D-5713 with Foster Wheeler Environmental Corporation (FWENC). This Project CQC Plan is an addendum to the *Final Contractor Quality Control Program Plan* (FWENC, 1999).

1.1 PURPOSE

The objective of the removal action at IRP Site 73 is to minimize any potential hazards associated with lead in surficial soils. The purpose of the Project CQC Plan is to establish the specific procedures and methods of QC for this project. The planned removal action at IRP Site 73, as described in the Work Plan, includes an initial geophysical survey; excavation of contaminated soil; verification sampling; stockpiling of the soil; stockpile soil sampling and classification; loading, transportation, and disposal of all excavated contaminated soil; placement and compaction of clean/uncontaminated backfill soil within the excavated areas at the site; and site restoration. The field activities will also include installation of temporary facilities and site controls, erosion control, and waste sampling/analysis and classification.

The Project CQC Plan provides an effective QC system to ensure the quality of all work performed by FWENC and its subcontractor personnel.

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 Work Plan.

The Project CQC Plan will be implemented for the following activities:

- Installation of temporary facilities (site trailer office [if necessary], security fence around the site, work zones, and equipment staging areas)
- Pre-construction submittals
- Site survey
- Removal of water tower footings (approximately upper 3 feet)
- Excavation, verification sampling and analysis, stockpile sampling and analysis

- Waste profiling, transportation, and disposal
- Backfilling the excavation areas
- Restoration of the site
- Post-construction submittals

Prior to any fieldwork, the following documents will be prepared in accordance with SWDIV requirements:

- Work Plan
- Sampling and Analysis Plan (SAP)
- Project CQC Plan
- Site-Specific Health and Safety Plan (SHSP)

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 are established within the organization to ensure proper QC documentation and recordkeeping for the work performed. The project organization chart showing the reporting lines for each individual is provided in Figure B.2-1.

All personnel assigned to this project will be qualified and experienced. The responsibilities and authorities of the key project personnel are described in the following paragraphs.

2.1 CONTRACT TASK ORDER PROJECT MANAGER

The CTO Project Manager (PJM), Mr. Hamlet H. Hamparsumian, is responsible for the direction, execution, and successful completion of project tasks to achieve overall project goals. The PJM has responsibility for and authority to perform the following quality-affecting activities related to the project:

- Coordinate work activities of subcontractors and FWENC personnel and ensure that all personnel adhere to the administrative and technical requirements of the project.
- Monitor and report the progress of work and ensure that project deliverables are completed on time and within project budget.
- Ensure adherence to the quality requirements of the contract, project scope of work, and the CQC Plan.
- Ensure that all contract work will meet the requirements of the specifications and applicable codes.
- Ensure that all work activities are conducted in a safe manner in accordance with the SHSP, *U.S. Army Corps of Engineers Safety and Health Manual* (USACE EM-385-1-1 [1996]), and all applicable Occupational Safety and Health Administration regulations.
- Serve as the primary contact between DON personnel and FWENC for actions and information related to the work.
- Coordinate satisfactory resolution and completion of evaluation and acceptance report for Nonconformance Reports (NCRs).

2.2 QUALITY CONTROL PROGRAM MANAGER

The Quality Control Program Manager (QCM), Mary Schneider, is responsible for the oversight of program QC including chemical data acquisition. The duties of the QCM include the following:

- Establish and maintain the Quality Program.
- Work directly with the Program Manager, Neil Hart, and the DON to ensure implementation of the Program QC Plan.
- Be the focal point for coordination of quality matters across all projects and resolving quality concerns.
- Provide quality directions, training to Project Quality Control Manager (PQCM), and others performing quality functions.
- Has authority to suspend project activities if quality standards are not maintained.
- Interface with the DON, including SWDIV Quality Assurance (QA) Officer on quality-related items.
- Implement the DON technical directives relating to quality.

2.3 CONSTRUCTION MANAGER (PROJECT SUPERINTENDENT)

The Construction Manager/Project Superintendent reports to the PJM and is responsible for coordinating, directing, implementing, and supervising site-specific activities. Specific duties of the Project Superintendent include:

- Implementing site-specific activities in accordance with the Work Plan.
- Directing field leaders, support personnel, and subcontractors.
- Administering site access.
- Maintaining work site, vehicles, and equipment.
- Coordinating and maintaining logistics of all components of on-site tasks, including all personnel and equipment.
- Preparing daily production status reports and estimating future scheduling needs and monthly summary reports.
- Coordinating, preparing, and completing all required field reports.
- Ensuring that all safety requirements are met, enforced, and documented.
- Ensuring compliance with applicable regulations, including contractual requirements, and health and safety requirements.
- Maintaining the current 2-week look ahead schedule of field activities.
- Recommending changes to improve project efficiency and effectiveness.

- Verifying field personnel are trained and qualified to complete assigned tasks.
- Attending QC meetings.
- Coordinating work efforts with the PQCM and Site Health and Safety Specialist (SHSS).
- Providing technical justification for change orders.
- Maintaining site security.

2.4 PROJECT QUALITY CONTROL MANAGER

The PQCM is responsible for overall management of project QC and reports to the QCM. 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 the work performed and to direct the correction of all nonconforming work.

The PQCM's resume and appointment letters are included as Attachment 1.

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

- Providing and maintaining an effective QC system for all site activities.
- Monitoring QC activities to ensure conformance with authorized policies, procedures, contract specifications, required standards, sound practices, and methods of quality construction.
- Maintaining sufficient staff to perform all QC activities to ensure QC for all work phases, work shifts, and work crews.
- Preparing the Daily Contractor Quality Control Reports (CQCRs).
- Performing and coordinating the three phases of inspection (Preparatory, Initial, and Follow-up) and making sure they are implemented for all definable features of work (DFWs).
- Issuing and enforcing NCRs.
- Ensuring that all on-site inspections, testing, and sampling are performed in accordance with the plans, specifications, and applicable codes.
- Ensuring all required tests and inspections are performed and results are documented.
- Conducting required QC meetings, including the coordination and mutual understanding meeting, site survey visit, and other scheduled meetings.
- Providing inspection.
- Conducting or supervising testing and sampling.
- Coordinating and maintaining submittal register, photograph log sheet, request for information, and NCR log.

- Reviewing and maintaining records of approved submittals, Design Change Notices (DCNs) for construction activities, and Field Change Requests (FCRs).
- Inspecting material delivery handling and storage in accordance with technical specifications.
- Updating as-built drawings for invoice certification.
- Reviewing and approving submittals and shop drawings and/or forwarding submittals as information only or for approval.
- Maintaining testing and rework logs.
- Issuing compliance notice on material, equipment, work-in-place, and workmanship.
- Review project plans and procedures for quality issues.
- Identifying the need for corrective action and initiate, recommend, and coordinate solutions for project quality problems.
- Performing submittal reviews and approvals/certifications.
- Directing the removal of work, material, and equipment that is not in compliance with plans and specifications.
- Recommending removal of any individual from the project who consistently fails to perform their duties properly.
- Immediately stopping any segment of work which does not comply with the specifications and drawings.

2.5 PROJECT ENGINEER

The Project Engineer (to be determined later) is responsible for implementing, directing, and supervising engineering activities on site. The Project Engineer will notify the PJM of any design changes. Field engineering will include supervising or conducting survey control, inspection and testing, and implementation of the project technical specifications and contract drawings. The duties of the Project Engineer include:

- Ensuring all engineering work activities are performed in accordance with the FWENC Corporate engineering procedures, technical specifications, contract drawings, Work Plan, and applicable professional standards.
- Providing oversight of engineering work activities performed by subcontractors.
- Implementing engineering design requirements.
- Conducting field engineering inspections and tests required by the project technical specifications and contract drawings.
- Ensuring the quality of survey control data.
- Inspecting the work performed each day for compliance with the Work Plan and technical specifications.

- Preparing engineering documents in accordance with the technical specifications and drawings.
- Issuing and maintaining FCRs, DCNs, and NCRs.

2.6 SITE HEALTH AND SAFETY SPECIALIST

The SHSS ensures that all elements of the approved SHSS are implemented and enforced on site. The SHSS reports directly to the Program Health and Safety Officer 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:

- Ensuring enforcement of the SHSP through daily site inspections.
- Coordinating site health and safety requirements with the Project Superintendent and PJM.
- Ensuring maintenance of all health and safety monitoring and personal protective equipment and direct site-monitoring activities.
- Reporting all health and safety monitoring results to the Program Health and Safety Officer.
- Coordinating daily field activities with the Project Superintendent.
- Coordinating site safety and emergency response duties; verifying the site communications system with site personnel.
- Implementing periodic safety equipment and supplies.
- Performing inspection of safety equipment.
- Coordinating with the Program Health and Safety Officer and Resident Officer in Charge of Construction (ROICC).
- Maintaining recordkeeping and reporting systems.
- Initiating necessary revisions or changes to the SHSP.
- Maintaining site control procedures.
- Maintaining current certification for first aid and cardiopulmonary resuscitation.

2.7 SUBCONTRACTORS AND VENDORS

Qualified subcontractors will be procured to provide services for this project. Subcontractors and vendors will comply with the requirements of the contract specifications, drawings, Project CQC Plan, and applicable codes and regulations. The subcontractors are responsible for field inspection of their operating activities. The PQCM ensures that this is accomplished.

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

3.0 SUBMITTALS

This section describes the review and approval process of submittals. In addition, the PQCM will institute and maintain a submittal register 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.

Submittals will be scheduled, reviewed, certified, and managed in accordance with the latest edition of the NFGS-01330E submittals.

Required submittals may consist of the following types:

- **Shop Drawings**—Drawings, schedules, diagrams, and other data prepared specifically for this contract, by or through contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower-tier contractor to illustrate portion of work.
- **Product Data**—Preprinted material such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate portion of work, but not prepared exclusively for this contract.
- **Sample**—Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to portions of work, illustrating portion of work or establishing standards for evaluating appearance of finished work or both.
- **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

Submittal descriptions (SDs) are as follows:

- **SD-01, Drawings**—Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, detail of fabrications, layout of particular elements, connections, and other relational aspects of the work. A type of shop drawing.
- **SD-02, Instructions**—Preprinted material describing installation of a product, system, or material, including special notices and Material Safety Data Sheets, if any, concerning impedances, hazards, and safety precautions. A type of product data.
- **SD-03, Schedules**—A tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in work. A type of shop drawing.

- **SD-04, Reports**—Reports of inspection and laboratory testing, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.
- **SD-05, Test Reports**—Reports 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 requirements specified by naming the test method and material. Test reports must state that the test was performed in accordance with test requirements, state test results, and indicate whether material, product, or system has passed or failed test. Testing must have been conducted within 3 years of the date of award of this contract. A type of product data.
- **SD-06, Field Test Reports**—A written report which includes the findings of a test made at the job site, in vicinity of the job site, or on a sample taken from job site, on a portion of work during or after installation. The report must be signed by authorized official of testing laboratory or agency and must state that the test was performed in accordance with the test requirements, state the test results, and indicate whether material, product, or system has passed or failed the test. A type of shop drawing.
- **SD-07, Records**—Documentation to ensure compliance with an administrative requirement or to establish an administration mechanism. A type of administrative and closeout submittal.

3.2 SUBMITTAL REQUIREMENTS

Submittal requirements will be in accordance with the project technical specifications and Work Plan. The following requirements apply to all submittals:

- Each submittal will be complete and in sufficient detail to allow determination of compliance with the plans, specifications, and applicable codes.
- Each submittal will be reviewed by the PQCM or an approved reviewer.
- A Catalog Cut/Shop Drawing Transmittal and Approval form (Attachment 2) certifying compliance with all contract requirements will accompany each submittal in accordance with the technical specifications.
- Proposed deviation from the contract requirements will be clearly identified.
- Submittals will include items such as applicable drawings, descriptive literature, test reports, samples, 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 DOS AutoCAD version 13 or Microstation version 5.0, or later, compatible format.
- Geographic Information System data will conform to the Tri-Service SDS and be submitted in 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.

3.3 REVIEW OF SUBMITTALS

Submittals will be reviewed to ensure completeness, accuracy, and contract compliance. All items will be checked and approved by the PQCM or designated representative. 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 by the PQCM 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 and forward to the required DON personnel. 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, in rare instances, certain submittals may require accelerated processing to maintain the site activities schedule and with the approval of the DON.

The PQCM will update the submittal register regularly. A transmittal and approval form (Attachment 2) will accompany each submittal. Each transmittal and submittal, except sample panel and sample installation, will be identified with the following information permanently adhered to or noted on each separate component:

- Project title and location.
- Contract number and CTO number.
- Name, address, and phone number of subcontractor, supplier, manufacturer, and any other second-tier contractor associated with the submittal.
- Date of the submittal.
- SD number of each component of the submittal.
- Product identification and location in project.
- Description of item being submitted, including reference to specification section and SD number.
- Approval of submitting organization indicating conformance to the requirements.
- Submittals will 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.

Administrative submittals will be formatted as follows:

- When a submittal includes a document that 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 the document, but rather to a separate sheet accompanying document.

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

Submittal will 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. The PQCM will advise the 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 DON personnel as an information-only submittal.

Nonconforming submittals will be returned to the submitter for correction, resolution of comments, and re-submittal.

3.6 REVIEW AND PROCESSING OF SUBMITTALS THAT REQUIRE DON APPROVAL

Submittals will 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. Reviewed and certified submittals will be forwarded to the contracting officer utilizing the transmittal and approval form (Attachment 2). 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 N68711-98-D-5713, 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 the 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 re-submittal, if required. No work will begin until submittals for that work have been returned as "Approved" or "Approved as Noted".

3.7 REVISED SUBMITTALS

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

The submittal number used for the original submittal will be used for each re-submittal followed by a sequential alpha suffix to indicate re-submission.

4.0 TESTING (OTHER THAN CHEMICAL SAMPLING AND ANALYSIS)

The PQCM shall ensure the performance of all tests specified or required by the project specifications and drawings to verify control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project will be included in the Work Plan. The type, number, and frequency of required tests (if testing is identified during field activities) will be specified in the Testing Plan and Log (Table B.4-1) attached to an FCR and in addendums to the Work Plan. QC discussions relating to chemical sampling and analysis are provided in the SAP. The Field Engineer is responsible for conducting or coordinating the required timely tests. For all testing activities, the PQCM will perform the following:

- 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. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. The actual test reports may be submitted later to the DON Remedial Project Manager (RPM), the NAVWPNSTA Installation Restoration (IR) Program Manager, 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 recognized industry and 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 and the RPM.

4.2.2 Accreditation for Environmental Projects

Laboratories performing Installation Restoration Program work funded by Environmental Restoration, Navy (ER,N) (formerly Defense Environmental Restoration Account) or Base Realignment and Closure (BRAC) (ER,N eligible in the absence of BRAC funding) must successfully complete the Navy Laboratory Evaluation Program. Unless otherwise specified, sampling and analysis shall be performed using current U. S. Environmental Protection Agency 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

The Project CQC Plan is the means by which FWENC ensures that all field activities, including that of subcontractors and suppliers, comply with the requirements of the contract. The DFWs 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 DFW. The definable features for this project are as follows:

- Archaeological data recovery
- Mobilization
- Installation of temporary facilities, including security fence and laydown area
- Setup and delineation of the excavation limits
- Air pollution control
- Erosion control provisions, including installing berms or silt fence, if necessary
- Site preparation
- Removal of the existing irrigation system within the excavation limits and re-installation following backfilling
- Excavation and removal of the contaminated soil, stockpiling of the excavated contaminated soil, verification sampling of the excavated areas, and random stockpile sampling
- Surveying the limits of the excavation
- Removal of concrete footings
- Waste classification and profiling
- Waste transportation and disposal
- Verification of imported soil to confirm that it is free of contamination
- Placement of backfill in the excavated areas
- Backfill compaction testing
- Grading and site restoration
- Traffic control
- Demobilization

Detailed descriptions of each DFW are presented in Table B.5-1.

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

Attachment 2 contains inspection checklist forms for each phase. Inspection requirements specific to this project are discussed below.

5.1 COORDINATION AND MUTUAL UNDERSTANDING MEETING

Prior to start of site work, the PJM will conduct a pre-construction kickoff meeting with the RPM, the ROICC, and the NAVWPNSTA IR Program Manager 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 field activities, production, and the PQCM duties with the ROICC. As a minimum, the FWENC PJM, the Site Manager/Superintendent, and the PQCM would be required to attend this meeting. Minutes of the meeting shall be prepared by the PQCM and signed by the FWENC PJM and the RPM and/or the ROICC or the NAVWPNSTA IR Program Manager. 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 or, if necessary, an alternate location determined by the ROICC or the NAVWPNSTA IR Program Manager. The meeting 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 DFW listed in the technical specifications. These inspections will include the following:

- A review of each paragraph of applicable specifications
- A review of the contract plans and drawings
- A check to ensure that all materials and/or equipment have been tested, submitted, and approved
- A check to ensure that provisions have been made to provide required control inspection and testing
- An examination of the work area to ensure that all required preliminary work has been completed and is in compliance with the contract
- A physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored
- A review of the appropriate activity hazard analysis to ensure that safety requirements are met
- A discussion of procedures for constructing the work, including repetitive deficiencies
- Documentation of construction tolerance and workmanship standards for that phase of work
- A check to ensure that the portion of the Project CQC Plan for the work to be performed has been accepted by the DON
- Confirmation that all necessary training and/or health and safety certifications for personnel performing the activity are on file at the site

The PJM, the RPM, the NAVWPNSTA IR Program Manager, and the ROICC shall be notified at least 2 workdays in advance of each preparatory phase activity. This phase shall include a meeting that the PQCM conducts and that will be attended by other responsible construction personnel, as applicable, such as the Project Superintendent.

The preparatory phase meetings will be documented by item on the Inspection Checklist and will be reported on the CQCR with the Preparatory Inspection Checklist included as an attachment. 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 DFW and will include the following:

- A check of preliminary work to ensure that it is in compliance with contract requirements
- A review of the Initial 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 that 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 RPM, the NAVWPNSTA IR Program Manager, and the ROICC will be notified at least 2 workdays 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 DFWs under the following circumstances: 1) if the quality of ongoing work is unacceptable as determined by the PJM or designee, the ROICC, the NAVWPNSTA IR Program Manager, or RPM, 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, or 4) if other problems develop.

5.7 COMPLETION INSPECTION

Completion inspections will be performed as summarized in this section.

5.7.1 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 RPM, the NAVWPNSTA IR Program Manager, and the ROICC 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. The list will be included in the QC documentation and submitted to the PJM or designee, the ROICC, the NAVWPNSTA IR Program Manager, and the RPM within 5 workdays 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 2, and attached to the CQCR.

5.7.2 Pre-final Inspection

The PJM or designee will conduct the pre-final inspection, and the ROICC, FWENC QC inspection personnel, the PQCM, or other primary management representative, 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 is required to verify at this time that all specific items previously identified to FWENC as being unacceptable, along with all remaining project work, will be complete and acceptable by the date scheduled for the pre-final inspection. At this inspection, the PJM or designee will develop a specific list of incomplete and/or unacceptable work performed under the contract and will provide this list to FWENC.

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 RPM, the NAVWPNSTA IR Program Manager, or the ROICC. Notification will be provided prior to the planned final acceptance inspection date. The notification 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.

5.8 INSPECTION DOCUMENTATION

The PQCM is responsible for the maintenance of the inspection records. Inspection records will be legible and clearly written to 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 FWENC. All inspection records will be made available to the DON.

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. Project documents to be controlled include the following:

- Meeting Minutes, Conference Notes, and Confirmation Notes
- Submittal Register
- Inspection Documentation
- CQCR
- Survey Logs
- Testing Plan and Log
- NCRs
- DCNs
- FCRs
- Project Plans
- Record (As-Built) Drawings

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 the following:

- Record inspection and/or testing performed
- Identification and location of each DFW and its current phase (preparatory, initial, 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, and 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

The records will indicate a description of trades working on the project, the number of personnel working, weather conditions encountered, and any delays encountered. Both conforming and nonconforming features will be covered with a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original of this report shall be furnished to the 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.

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 what was checked, 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 DON within 5 days after the date of the conference for concurrence and subsequent distribution to all attendees. At a minimum, this report will include the following:

- 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, in which FWENC personnel or their representatives participate 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 designee will forward a reproducible copy of the confirmation notices to the RPM or designee and the 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 2), 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 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 Item 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 a 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, 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 QC inspection staff and 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 a NCR that will include the following information:

- Description of nonconforming item or activity
- Detailed description of nonconformance
- Referenced criteria
- Recommended disposition and corrective action to prevent recurrence, as applicable
- Affected organization

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. In-process deficiencies will be noted briefly on the CQCR and detailed on the In-Process Deficiency Punch List. Items on the punch list that cannot be corrected will be considered 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

Item List in addition to a Construction Deficiency Report for evaluation and disposition. The PQCM will issue the Construction Deficiency Report summarizing discrepancies within 24 hours of discovery.

In the event a Construction Deficiency Report 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 PJM. Copies of completed reports will be sent to the DON representative.

7.1.3 Condition Requiring Stop Work

If corrective actions are insufficient, resolution cannot be reached, or results of prior work are indeterminate, work may be stopped. A Stop Work Order can only be issued by the Project Superintendent and the PQCM in writing. If there is a disagreement between the PQCM and the PJM, the difference will be brought to the attention of the QCM until resolution is achieved.

The conditions of the Stop Work Order will be described in detail on a Rework Item List in addition to the Construction Deficiency Report to allow evaluation of the problem(s) and proper corrective action(s). Work will not continue until the Stop Work Order has been rescinded by the individual who authorized it.

7.1.4 NCR Log

The PQCM will maintain a NCR log, which provides the NCR number, a brief description of the nonconforming condition, date of issue, point of contact for resolution, date of anticipated corrective action, and date closed.

7.2 NONCONFORMING ITEMS

The nonconforming items will be controlled to prevent inadvertent use. 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 re-inspecting. 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 "as-designed" or "as-specified" condition.

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 from the Project Superintendent before execution. The Project Superintendent will respond by issuing an appropriately executed DCN. A DCN will not be issued for a "Minor Change" FCR.

The Project Superintendent has the responsibility for identifying and providing input data relative to record conditions. Record drawings are drawings that reflect the as-installed conditions, and consist of the latest revision of the design drawing, plus attached copies of approved changes (FCRs).

7.4 CORRECTIVE ACTIONS

On 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 nonconformances. 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 Corporation Quality Program requires a quality management overview of the site QA/QC Program implementation. The PQCM will perform regular internal QC 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

9.0 REFERENCES

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

U.S. Army Corps of Engineers. 1996. *U. S. Army Corps of Engineers Safety and Health Requirements Manual.* USACE EM-385-1-1. September 3.

TABLES

TABLE B.4-1

TESTING PLAN AND LOG

CONTRACT NUMBER: N68711-98-D-5713, CTO No. 0023 **PROJECT TITLE AND LOCATION:** IRP Site 73, Naval Weapons Station, Seal Beach, CA **CONTRACTOR:** Foster Wheeler Environmental Corporation

Specification Section and Paragraph Number	Item of Work	Test Required	Accredited/ Approved Lab		Sampled	Tested By	Location of Test		Frequency	Date Completed	Date Forwarded to Contractor Office	Remarks
			Yes	No			On Site	Off Site				
Work Plan Section 4 10	1	Clean Fill Testing TAL metals, VOCs, SVOCs, PCBs, and pesticides	Yes	--		TBD	--	X	One per every 1,000 tons	TBD		
Compaction Testing Section 4 10	2	Field in-situ tests ASTM-D-1557	NA	NA		TBD	X	--	A minimum of 2 tests per 12-inch compacted layer	TBD		

Notes:

NA – Not applicable

TBD – To be determined at a later date or time

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Mobilization	• Review available station utility drawings for areas where the trailers are going to be placed • Mark out trailer locations with white paint to delineate geophysical survey areas and demark locations for USA clearance • Verify that trailer locations are free from ponding of stormwater. • Verify that the ROICC and NAVWPNSTA IR Program Manager approve the locations for the trailers • Verify that the ROICC and NAVWPNSTA IR Program Manager approve the location of the waste storage area. • Verify that lock out/tag out procedures are in place. • Verify that trailer tie-down locations do not conflict with subsurface utilities • Verify that deliveries are scheduled and delivery locations are known by the subcontractor • Verify that the Traffic Plan is used for delivery of trailers and equipment. • Verify that procurement of equipment, materials, and subcontractors are in place.		• Ensure that parties contacted by USA respond to their notifications. • Ensure that base drawings are provided to the subcontractor • Set up waste consolidation and storage area. • Set up trailers including tie-downs. • Connect utilities to trailers • Ensure that stairs to trailer are secure and safe • Photograph trailers inside and out. • Take delivery of equipment and materials. • Photograph equipment including vehicles and construction equipment		• Ensure that work has been completed in compliance with scope of work, Work Plan, drawings, and technical specifications • Ensure that USA permit is on site in project file. • Ensure that drawings generated by geophysical survey contractor are received and kept on site in project file. • Ensure that any documentation for the utility hookup work has been submitted. • Ensure that photographic documentation is complete and is kept on site in the project files	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Setup and delineation of the excavation limits	• Check the Work Plan. • Discuss with client. • Ensure that the surveyor is using California State Plan coordinates and is using survey equipment • Survey the limits of the excavation using coordinates provided in the Work Plan figures.		• Ensure that work being performed is based on the Statement of Work. • Ensure that proper benchmarks and survey control points are used by the surveyor		• Ensure that the survey of the limits of excavation is complete	
Installation of temporary facilities	• Ensure that equipment and material meet specification requirements.		• Ensure the proper installation of site security fence, temporary equipment, trailer and sanitary facilities, signs, and warnings.		• Perform ongoing inspection of the temporary facilities, security fence, and equipment until removed.	
Air pollution control	• Verify that engineering measures to control dust emissions are established		Ensure that proper implementation of dust control measures: • Maintain soil moisture content at a minimum of 5 percent Spray work area with water • Cover material being transported.		• Perform ongoing inspection for proper dust control	
Erosion control	• Establish engineering measures for erosion and sediment control to be implemented in accordance with approved procedures.		Ensure that proper installation/ construction of: • Ditches and berms • Silt fences • Sandbags		• Ensure that proper maintenance and ongoing inspection	
Site preparation	• Ensure that operation will be carried out in accordance with approved procedures		• Prepare work zones (support zone, contaminant reduction zone, and exclusion zone) • Provide temporary fencing and barricade installation. • Establish staging areas. • Provide proper equipment mobilization on as needed basis. • Expose underground utilities.		• Perform ongoing inspection of material and equipment	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Site preparation (Continued)			• Establish decontamination procedures for equipment. • Install personnel air monitoring equipment. • Commence stormwater management activities • Verify that utilities, fences, irrigation system and so forth, removed during construction activities will be replaced, if required.			
Contaminated soil a) excavation b) stockpiling c) sampling	• Ensure that operation will be carried out in accordance with approved Work Plan and procedures.		• Excavate soil in 6-inch to 1-foot lifts • Correlate excavation with the geophysical interpretation on a lift-by-lift basis. • Excavation will not exceed below groundwater. • Contaminated soil shall be segregated and stockpiled separately on site for off-site disposal. • Stockpile area shall be bermed and covered to prevent surface runoff and dust control. • One sample randomly taken by hand auger for every 125-cubic yard batch of contaminated soil will be required for profiling. • A California-certified laboratory will analyze soil samples.		Perform ongoing inspection of all contaminated soil excavation and proper disposal of soil.	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Contaminated soil (continued)			• Perform sidewall and bottom chemical confirmation soil testing to verify and ensure that all soil with lead contamination above TCG has been removed • Personnel have required training: health and safety certifications on site.			
Survey the limits of the excavation	• Survey the excavated areas, including all low spots, grade breaks, top and toe of slopes, and the edges • Check the Work Plan. • Ensure that the California coordinate system is being used by the surveyor.		• Ensure that survey work is being performed based on the Statement of Work • Ensure that proper benchmarks and control points are used by the surveyor.		Ensure that the surveyor has completed the survey of all the excavated areas	
Waste classification and profiling	• Review Work Plan and waste classification requirements for this scope of work. • Verify that FWENC Compliance Manager, DON ROICC, and NAVWPNSTA IR Program Manager has received and reviewed the waste profiles for the wastes • Make arrangements with Laboratory • Verify that laboratory has completed Navy Laboratory Evaluation Program		• Confirm that waste characterization/ classification team has clear understanding of the scope of work and has specifications for their work on site. • Complete waste classification and profiling per Work Plan.		• Verify that samples are received by laboratory • Confirm that analytical results are received from the laboratory • Ensure that work has been completed in compliance with the Waste Management Plan requirements for waste classification. • Verify that all wastes are contained, profiled, stored, and labeled in accordance with the Waste Management Plan requirements.	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Waste transportation and disposal	• Review the Waste Management Plan for this scope of work. • Verify that FWENC compliance manager has approved the waste classification, transporter, and disposal facility. • Verify that the NAVWPNSTA IR Program Manager has approved the profile for the waste. • Make arrangements with transporter and disposal facility for transportation and disposal of waste.		• Confirm that subcontractor has clear understanding of the scope of work and has the specifications/scope of work for their work on site • Confirm that the Traffic Plan is implemented • Check the transporter's license and medical card prior to loading waste. • Load wastes and verify that the waste manifests are signed by the generator and transporter.		• Ensure that work has been completed in compliance with scope of work and Waste Management Plan. • Confirm that waste has been received by the disposal facility. • Confirm that copies of the waste manifests are on site in the project files.	
Verification of imported soil to confirm that it is free of contamination	• Ensure that operations will be carried out in accordance with approved Work Plan procedures		• Perform one sample randomly taken by hand auger from every 150 cubic yards of imported soil • A California-certified laboratory will analyze soil samples • Ensure that soil meets clean soil criteria.		• Verify that samples are received by laboratory. • Confirm that analytical results are received from laboratory prior to hauling soil to the site.	
Placement of backfill in the excavated areas	• Ensure that operations will be carried out in accordance with approved Work Plan procedures. • Verify that backfill is placed in 12-inch-thick compacted lifts.		• Ensure that backfill is placed in 12-inch-thick compacted lifts, by measuring the lift thickness		• Perform ongoing inspection of all backfill placement. • Ensure that lift thickness is in compliance with Work Plan requirements	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Backfill compaction testing	• Conduct compaction testing according to the Work Plan requirements		• Perform geotechnical testing of backfill to ensure compaction to 90 percent of the maximum dry density. • Ensure that two tests per each compacted lift are conducted.		• Perform ongoing inspection for proper testing frequency and verify test results • Ensure that compaction results of 90 percent of maximum dry density are achieved.	
Grading and site restoration	• Ensure that operation will be carried out in accordance with approved procedures		• The excavated area will be graded and restored to a condition consistent with its surroundings • The site will be graded to provide proper water drainage • Site cleanup shall include repair of any erosion or runoff-related damage. • Restoration activities will be coordinated with the ROICC and the NAVWPNSTA IR Program Manager. • A final survey will be performed to document as-built grades and conditions. • Remaining wastes generated during construction activities will be transported off site and disposed in accordance with the Waste Management Plan.		• Perform ongoing inspection of site restoration activities	

TABLE B.5-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Traffic control	• Ensure that operation will be carried out in accordance with approved procedures		• Traffic control shall be utilized to provide for the efficient completion of the work activities while minimizing the impact on the normal station traffic flow. • Traffic control shall be carried out in accordance with approved Work Plan.		• Perform ongoing inspection of project control activities.	
Demobilization	• Ensure that operation will be carried out in accordance with approved procedures.		• Decontaminate of all equipment, clean the project site, and inspect and certify completion. • Ensure that all demobilization activities are be conducted in accordance with the approved Work Plan.		• Perform ongoing inspection of demobilization activities. Joint DON/FWENC final inspections shall be conducted.	

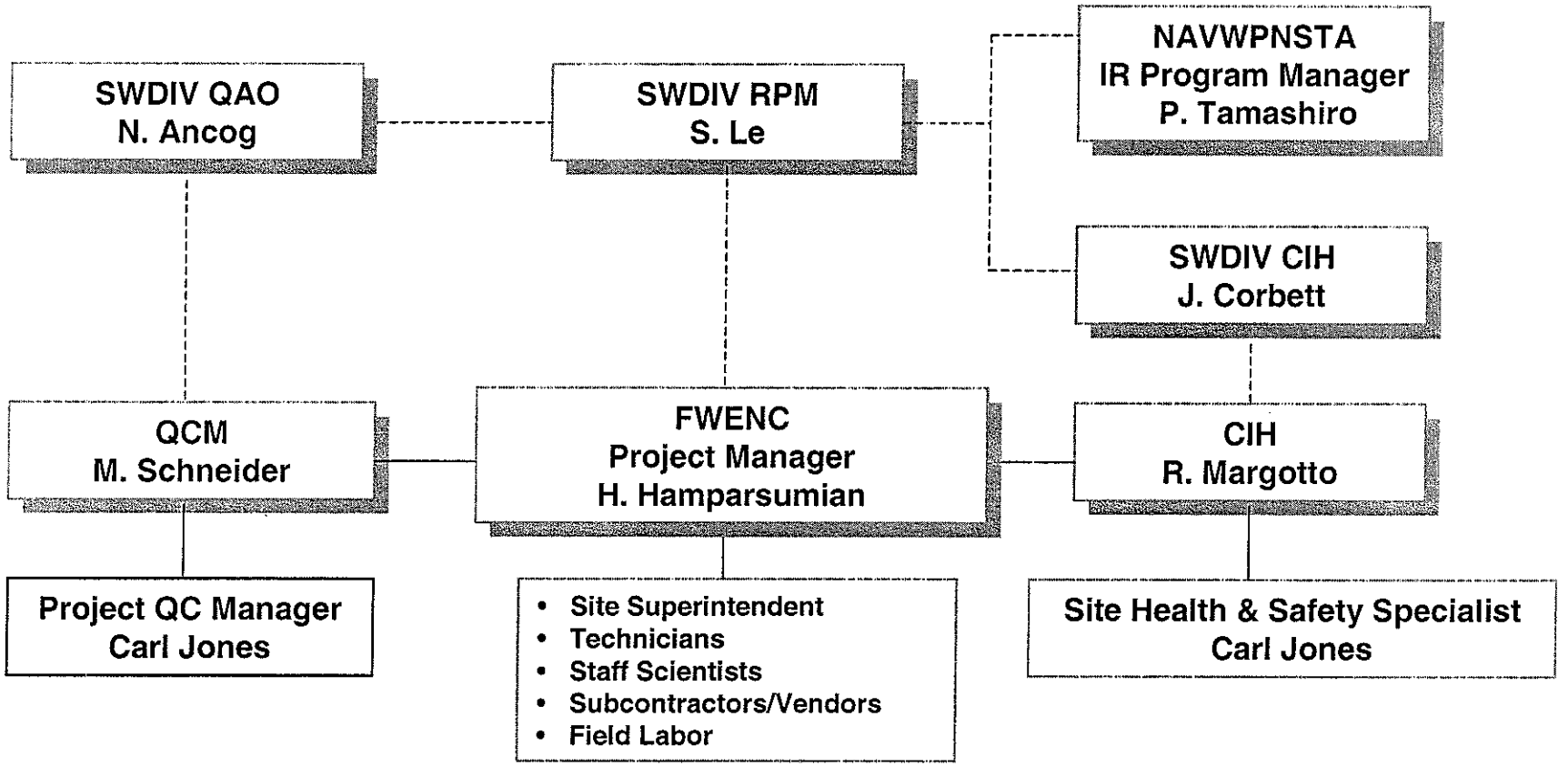
Notes:

DON – Department of the Navy
FWENC – Foster Wheeler Environmental Corporation
IR – Installation Restoration
NAVWPNSTA – Naval Weapons Station
ROICC – Resident Officer in Charge of Construction
TCG – Target Cleanup Goal
USA – Underground Service Alert

FIGURES

Figure B.2-1

Project Organization Chart



ATTACHMENT 1

APPOINTMENT LETTERS AND RESUMES

June 18, 2002

Mr. Carl Jones
Foster Wheeler Environmental Corporation
1230 Columbia Street, Suite 500
San Diego, CA 92101

Subject: Project Quality Control Manager

Reference: Contract No. N68711-98-D-5713,
Southwest Division Naval Facilities Engineering Command (SWDIV)
Environmental Remediation Contract, Contract Task Order (CTO) No. 0023,
Naval Weapon Station Seal Beach, Seal Beach, California

Dear Mr. Jones:

In accordance with the terms of Foster Wheeler Environmental Corporation's (FWENC's) Contract No. N68711-98-D-5713, this letter notifies you of your appointment as the Project Quality Control Manager for CTO No. 0023, Non-Time Critical Removal Action Installation Restoration Program Site 73 at Naval Weapon Station Seal Beach, Seal Beach, California.

As the designated Project Quality Control Manager, you will be responsible for managing the site-specific quality control requirements in accordance with the Final 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 verify that 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 nonconforming work.

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

Sincerely,

Foster Wheeler Environmental Corporation

Mary Schneider

Mary Schneider
Program Quality Control Manager

cc: H. Hampursumian, Project Manager

EXPERIENCE SUMMARY

A Civil Engineer experienced in the areas of hydrogeologic and hazardous waste evaluations, remediation projects, and construction projects. These projects include soil excavation for landfill cap construction and remediation; on-site treatment of soil by thermal desorption; construction of a soil-vapor extraction system; decommissioning and demolition projects; as well as remedial investigations and drilling programs for governmental agencies and industrial clients involving groundwater, soil, and soil vapor sampling. Major responsibilities have included preparation of various project-related reports; directing and performing the associated project field work; interacting with clients and regulatory agencies; reporting of results and interpretations; health and safety supervision of field activities; contractor quality control, and project management.

REGISTRATIONS/CERTIFICATIONS

Engineer-in-Training Certificate, XE095478, Issued: 02/95

TRAINING

Project Management Training, 200 Level, 04/1999
Construction Quality Management for Contractors, U.S. Army Corps of Engineers, 04/2000
40-Hour OSHA Hazardous Waste Operations, 06/1994
8-Hour OSHA Hazardous Waste Health and Safety Supervisor, 02/1995
Corporate 40-Hour Health and Safety Officer Cross-Trained, 02/1995
8-Hour OSHA Hazardous Waste Operations Refresher, 11/2000

EDUCATION

BS, Civil Engineering, University of California, Irvine, 1994

REPRESENTATIVE PROJECT EXPERIENCE

Naval Facilities Engineering Command - Southwest Division; Subsurface Soil and Groundwater Investigation - Site 14, Naval Weapons Station Seal Beach, Seal Beach, CA; 05/99-11/00 - As Project Manager, was responsible for attending pre-proposal conferences, preparing the cost proposals and assumptions, scope development, preparation of all pre-construction plans, initializing procurement of all subcontractors, development of the project schedule, supervision of field construction activities, control of costs and schedules, preparation of post-project closeout reports, reviewing invoices, interaction with the client, and community relations activities with the public [Restoration Advisory Board (RAB)]. The RAB is a citizen-based committee representing local community interests. As Project Manager, additional responsibilities included preparing and giving presentations to the RAB that described both the proposed work to be performed at Site 14, as well as the conclusions drawn from the collected data at the conclusion of the project. The objective of the project was to provide data on the extent of subsurface soil and groundwater contamination from a gasoline plume caused by a formerly removed, leaking underground storage tank (UST). The data obtained during the baseline survey, consisting of analytical results from soil and groundwater samples, observations for presence of free-floating product, and groundwater elevation measurements, were used to evaluate alternatives for future corrective action at Site 14. The scope of work performed during the project included a geophysical clearance; installation and sampling (soil and groundwater) of five groundwater monitoring wells; drilling and sampling of five soil borings; laboratory analysis of the collected samples; waste classification; transportation and disposal of the generated soil cuttings and wastewater; a land survey of the wells and borings; and site restoration. The well borings and soil borings were drilled and sampled using hollow-stem auger drilling methods and split-spoon sampling methods. Additional responsibilities included an evaluation of the soil and groundwater data collected during the project, delineation of the

extent of soil and groundwater contamination, and preparation of a groundwater-monitoring plan to measure and document the changes in plume limits and concentrations over time.

Naval Facilities Engineering Command - Southwest Division; Sub-Site 2A, Mole Pier; San Diego, CA; 02/00 - 10/00 - Alternate contractor Quality Control (CQC) Officer for the ongoing soil excavation and removal activities. Soil contaminants include metals, polynuclear aromatic hydrocarbons (PAHs), dioxins, and total petroleum hydrocarbons as diesel. The focus of the removal action is plume delineation, demolition of buildings, excavation of contaminated soils, and general construction activities associated with soil backfilling, compaction, and pavement and concrete installation activities. The major responsibilities included CQC supervision of the excavation and backfilling operations to assure compliance with the contract specifications and project work plan, surveying, and confirmatory sampling. Additional activities included grade checking of backfilled subgrade to establish proper aggregate and concrete finished grade; and performing engineering estimates for: 1) asphalt repair, 2) removal of temporary above-ground electrical utilities, and 3) the installation of a temporary sanitary sewer by-pass storage tank and lift station.

Naval Facilities Engineering Command - Southwest Division; Closure of the Industrial Waste Treatment Plant (IWTP) at the former Long Beach Naval Shipyard (LBNSY); Long Beach, CA; Project Manager; 06/99 -02/00 - As Project Manager, was responsible for attending pre-proposal conferences, preparing the cost proposals and assumptions, scope development, preparation of all pre-construction plans, initializing procurement of all subcontractors, development of the project schedule, supervision of field construction activities, control of costs and schedules, preparation of closeout reports, reviewing invoices, and client and regulatory interaction. The objective of the project was to obtain closure of a former wastewater pre-treatment facility authorized to operate under Permit-By-Rule (PBR) regulations. The project involved extensive research and client interaction to establish the site history, as well as developing a cost-effective approach to the decontamination work that also met the regulatory requirements. The focus of this project was to provide decontamination services and confirmation sampling and analysis at the IWTP at LBNSY in order to achieve closure approval from the City of Long Beach Department of Health as the lead agency for fixed treatment units operating under PBR. The project schedule and budget were effectively maintained by successfully obtaining approval from the lead agency to modify the closure criteria as the work progressed.

Naval Facilities Engineering Command - Southwest Division; Decommissioning of Stationary Demilitarization Furnace Facility; Naval Weapons Station Seal Beach, Seal Beach, CA; 05/98 - 08/99 - Responsibilities included Project Superintendent. The scope of work involved decontamination of a furnace facility, demolition of all structures, and removal of all debris and waste for disposal or recycling. The facility was formerly used to remove explosive residue from expended munitions. The Project Superintendent responsibilities included procurement of the subcontractors performing the work; supervision of the field work; and management of the waste sampling, characterization, and disposal. Other responsibilities included preparation of a decommissioning work plan for the decontamination and demolition work, a health and safety plan, as well as a project closeout report documenting all aspects of the work performed. Mr. Jones also instigated a review by a Certified Industrial Hygienist of sample data collected at the site prior to the start of decommissioning activities. The review revealed the presence of high levels of lead in the residual dust at the site, requiring the implementation of a strict health and safety lead program for the protection of field personnel performing the work.

Naval Facilities Engineering Command - Southwest Division; Soil Remediation Project, Installation Restoration Site 19; Naval Weapons Station Seal Beach, Seal Beach, CA; 02/98 - 10/98 - Responsibilities included supervision of the field work as the acting Health and Safety Officer, and providing field support to the Project Superintendent. The focus of the soil remediation project was the excavation and disposal of soil and debris from a former disposal pit. Additional responsibilities included preparation of the health and safety plan and project work plan.

Naval Facilities Engineering Command; Southwest Division; Supplemental Characterization of Site 7; Naval Weapons Station Seal Beach, Seal Beach, CA; 01/98 - 05/99 - Responsibilities included supervision of the field work as the acting Health and Safety Officer, contractor quality control supervision as the acting CQC Officer, and providing field support to the Project Superintendent. Other responsibilities included the preparation of a project health and safety plan, a project work plan, and a post field work report documenting all aspects of the work performed (project closeout report). The focus of the project was to perform a supplemental characterization of a former landfill in order to provide data to estimate the volume of contaminated soil and buried waste. The project involved oversight of a geophysical survey, as well as the delineation of suspected disposal trenches through the collection of core soil samples. Additional responsibilities included performing engineering calculations to establish the estimated volume of contaminated soil and buried waste.

Naval Facilities Engineering Command - Southwest Division; Installation Restoration Site 1; Naval Weapons Station Seal Beach, Seal Beach, CA; 11/97 - 05/98 - Responsibilities included performing an engineering estimate of the volume of metals-contaminated soil at a site formerly used as a wastewater settling pond. The work included estimates of the total volume of metals-contaminated soil, an estimate of the percentage of the excavated soil that would be considered hazardous waste for disposal purposes, and an estimate of the volume of overburden soil that was initially required to be excavated in order to expose the underlying contaminated soil.

Naval Facilities Engineering Command - Southwest Division; Soil Remediation Project, Installation Restoration Site 8; Naval Weapons Station Seal Beach, Seal Beach, CA; 01/98 -08/99 - Responsibilities included supervision of the field work as the acting Health and Safety Officer, contractor quality control supervision as the acting CQC Officer, and providing field support to the Project Superintendent. Other responsibilities included the preparation of a project health and safety plan, a project work plan, and a post field work report documenting all aspects of the work performed (project closeout report). The focus of the soil remediation project was the excavation and disposal of soil impacted by lead from the discharge of waste battery acid. The project was located within the boundaries of the Seal Beach National Wildlife Refuge, and therefore required the management of additional issues.

Operating Industries, Inc.; Landfill Cap Construction Project; Monterey Park, CA; 10/97-01/98 - Responsible for the oversight of the export of siltstone to be used to construct a monolithic soil cap at a landfill. The borrow site for the siltstone was within close proximity to a number of former oil production wells. Responsibilities included quality control of the four week export operation to ensure both hydrocarbon-free material and the correct soil type. The project resulted in the successful export of over 40,000 bank cubic yards of acceptable material for the cap construction.

ICI Americas, Soil Vapor Extraction Pilot Test, Arbco Facility, Van Nuys, CA; 03/97 -08/97 - Mr. Jones was responsible for overseeing the four week construction of the soil vapor extraction system, including well installation, as well as operation and monitoring of the system for the duration of the three month pilot test. The system was comprised of four nested vapor extraction wells, as well as multiple nested monitoring wells and soil gas probes.

Naval Facilities Engineering Command - Southwest Division; Corrective Action Plan, Site Remediation, Former Fire Fighter Training Facility, San Diego, CA; 06/96 -09/97- The focus of the site remediation was the removal of two free-floating hydrocarbon plumes present on the groundwater table, the thermal oxidation of the soil gas beneath the site, and activated carbon treatment of the groundwater associated with the hydrocarbon plumes. The extraction system consisted of a network of 30 multi-phase extraction wells designed for the simultaneous removal of the free product, groundwater, and soil gas. The wells were manifolded to a treatment and removal system consisting of an activated carbon treatment system for the groundwater and thermal oxidizer for the soil gas. Mr. Jones was

responsible for assisting in quality control inspections of the work as it progressed to ensure compliance with the contract specifications and project work plan.

ICI Americas; Removal Action, Arbco Facility, Van Nuys, CA; 05/96 - 10/96 - Mr. Jones was responsible for the supervision and support of pre-excavation and confirmatory soil sampling, excavation support, and health and safety supervision during the remedial action. The focus of the remedial action was the removal of three sumps and a four stage clarifier from the interior of a former printed circuit board manufacturing facility. Additional responsibilities included the supervision and quality control of the contamination delineation activities, where the nature and extent of the metals-impacted soil was characterized and quantified in order to provide data for a health- based risk assessment.

Naval Facilities Engineering Command - Southwest Division; Decommissioning of Research, Testing and Evaluation (RT&E) Facility; Naval Weapons Station Seal Beach, Seal Beach, CA; 10/96-08/97- Responsibilities included preparation of the contractor quality control and health and safety plans for the decommissioning activities, as well as a closeout report documenting all aspects of the work performed. Additional responsibilities included the procurement of the subcontractor cost estimates for the work to be performed, as well as health and safety supervision of the actual decommissioning activities. The facility was used to test rocket boosters used during NASA's Apollo space program. The focus of the decommissioning included the removal of residual TCE and other materials present in a network of above- and below-ground transmission pipelines and storage tanks. The project also included the removal of TCE contaminated groundwater from the basement of a structure and treatment of the groundwater through activated carbon adsorption.

Naval Facilities Engineering Command - Southwest Division; Mole Pier; San Diego, CA; 05/95 - 05/96 - Assisted in the excavation and on-site thermal treatment of soil contaminated with hydraulic fluid. The focus of the removal action was the removal, screening, treatment, backfill, and compaction of soil from a former disposal pit. The major responsibilities included surveying, excavation support, confirmatory sampling, free product recovery, and health and safety supervision. Health and safety responsibilities involved the supervision of soil thermal treatment and excavation activities, including area sampling for H2S, CO, VOCs, and dust; as well as personal air sampling for VOCs, metals, dust, and silica. Also assisted in preparation of the project closeout report documenting the field activities.

National Aeronautics and Space Administration; Comprehensive Environmental Response, Compensation, and Liability Act-Remedial Investigation/Feasibility Study; Jet Propulsion Laboratory; Pasadena, CA; 06/94 -04/96 - Completed groundwater sampling events during which numerous shallow standpipe wells and deep multi-port groundwater monitoring wells were sampled. The deep multi-port monitoring wells contain casing systems that allow for the simultaneous compliance monitoring of five separate zones in each well. Other responsibilities included conducting hydraulic conductivity testing of on-site groundwater monitoring wells and subsequently analyzing the data using the computer software program Aqtesolv®. In addition he assisted in the construction of nearly 30 on-site multi-port soil vapor wells and helped complete an extensive 5-week soil sampling program using reverse-air, percussion hammer drilling methods. Additional responsibilities included extensive involvement in the construction and development of 5 off-site deep multi-port wells using reverse circulation mud rotary drilling methods.

Teledyne Aircraft Products, Battery Products Unit; Redlands, CA; 12/94-01/95 - Assisted in several quarterly groundwater sampling events and in the production of the reports presenting the results. The sampling is completed with very strict quality assurance/quality control protocols under the direction of the California Department of Toxic Substances Control, U.S. Environmental Protection Agency, and California Regional Water Quality Control Board.

Teledyne Aircraft Products; Cast Products Unit; Pomona, CA; 08/94 - Completed a subsurface soil investigation as part of a utility pipeline clearance program involving the drilling and sampling of several locations using hollow-stem auger drilling methods. A report was produced outlining field methods utilized, and analytical results.

DISCIPLINE CODES

004 Civil Engineers, Y

SKILL SET

AIR SCIENCES

Air Quality Permitting
Ambient Monitoring

BIOLOGICAL SCIENCES

Aerial Surveys
Groundwater Sampling
Mapping
Permitting
Project Management
Resource Planning
Sediment Control
Slope Stability
Terrestrial and Wetland Ecological Investigations
Wetlands Mitigation

CHEMICAL SCIENCES

Air Sampling
Drum Sampling
Fate and Transport Modeling
Field Sampling and Analysis Plan
Groundwater/Surface Water Sampling
Preliminary Assessment/Site Investigation
Quality Assurance
Remedial Action
Remedial Investigation
Remedial Investigation/Feasibility Study
Resource Conservation Recovery Act
Site Characterization
Site Closure Plan
Soil/Sediment Sampling
Task Leader
Treatability Study

GEOSCIENCE

Borings and Wells - Geotechnical Borings
Borings and Wells - Monitoring Well Installation
Borings and Wells Recovery Well / Production Well Installation
Hydrogeology - Groundwater Hydraulics
Hydrogeology - Pump Test Analysis
Hydrogeology - Pump Test Performance
Hydrogeology - Slug Test Analysis
Hydrogeology - Slug Test Performance
In Situ Remediation - Soil Vapor Extraction
Modeling - Contaminant Transport
Modeling - Groundwater Flow
RCRA/CERCLA
Sampling - Groundwater
Sampling - Sediment
Sampling - Soil
Sampling - Water Level Measurements
Soil Gas Investigations
Underground Storage Tanks / Refineries

HEALTH PHYSICS

Decontamination & Decommissioning Operations
Decontamination & Decommissioning Planning

REGULATORY AFFAIRS

Air Permitting
ARARs
Asbestos
Base Realignment and Closure Requirements
DOT
DOT Hazardous Materials
Hazardous & Solid Waste Mgmt
Hazardous Waste Management
Inspections/Audits
Installation Restoration Program
Investigation-Derived Waste Mgmt
ISO 14000
LDRs
Mixed Waste

NCP
NEPA
NPDES
Pollution Prevention
RCRA Closure
RCRA Generator Requirements
Remediation
UST Closure
UST Remedial Monitoring
Waste Minimization
UST Corrective Action
Wetlands
Waste Transportation & Disposal

SOCIAL SCIENCE

Community Relations
Public Involvement

OTHER DATA

Office Location: Santa Ana
FWENC Hire Date: 06/20/1994
Years w/Other Firms: 0
Daytime Phone: 949-756-7538

James C. Chatters, Ph.D.
Principal Investigator

EXPERIENCE SUMMARY

Dr Chatters took his present role as Foster Wheeler Environmental Corporation's Cultural Resources Lead after operating his own consulting firm and directing cultural resources management programs for the University of Washington, Central Washington University, and Battelle, Northwest. He is a broad-spectrum paleoscientist with extensive experience in the archaeology and paleoecology of the Western United States, having spent 37 years working on archaeological/ cultural resources projects in California, the Great Basin, Pacific Northwest and Great Plains, Alaska, and Hawaii. His work for Federal, State, and local governments and private corporations has ranged from literature surveys, overviews, and cultural resources management plans to large-scale, multi-site data recovery on both prehistoric and historic archaeological sites and districts. That work entailed interaction and consultation with more than a dozen American Indian tribes and a wide range of federal, state, and local regulators. Dr Chatters has disseminated results of his archaeological and paleoecological research in more than 50 project reports, over 40 journal articles and book chapters, and a trade book.

Dr. Chatters work has included a variety of archaeological survey, evaluation, and data recovery projects in California, located in the Sacramento Valley, Southern Coast, Central Coast, Owens Valley, and the Mojave Desert. This group included Encinitas Tradition sites in Orange County and on Vandenberg Air Force Base. He has directed or participated in excavations at more than 20 sites that predate 3000 B.C., and directed data recovery excavations at more than 23 sites. As a faunal analyst he has studied collections of marine and freshwater shellfish and mammal, bird, and fish bone from sites in Orange, Shasta, Butte, Inyo, Kern, San Bernardino, and Santa Clara Counties, California, as well as many parts of Washington, Oregon, Idaho, and Alaska. He is also an experienced human osteologist and has served as a forensic anthropologist for the past seven years.

EDUCATION

Ph.D., Anthropology (Archaeology, Paleoecology), University of Washington, Seattle, 1982
M.A., Anthropology (Archaeology), University of Washington, Seattle, 1976

REPRESENTATIVE PROJECT EXPERIENCE

Cultural Resources Testing and Evaluation for Management Region 5, Edwards Air Force Base, California. As Principal Investigator, completed evaluations and reporting on 30 archaeological sites in the western Mojave Desert, which ranged from Pinto to Late Prehistoric Periods.

East Transportation Corridor Construction Monitoring and Mitigation, Transportation Corridor Agencies of Orange County, California. Identified pollen, animal bone, and marine shells from San Diegito and Encinitas Tradition archaeological sites.

James C. Chatters, Ph.D.
Principal Investigator

Cultural Resources Evaluation, Monitoring, and Data Recovery for Base Fiber Optic System Construction, Vandenberg Air Force Base, California. Managed and supervised archaeological survey, test excavations, and data recovery prior to, and monitoring during, fiber optic line construction. Most interesting site (excavated) dated to the Encinitas Tradition (Millingstone Horizon).

Lake Briton Data Recovery, Pacific Gas and Electric, Shasta County, California. Developed research design, conducted invertebrate faunal analysis (including seasonality), and wrote project synthesis for a large-scale archaeological data recovery project on the Pit River of Northern California.

Site CA-SCL-714/H Data Recovery, Calpine Corp., Santa Clara County, California. Principal Investigator, geoarchaeologist and faunal analyst conducting data recovery from a protohistoric memorial feasting site in former territory of Costanoan peoples.

Wells Reservoir Archaeological Project, P.U.D. no. 1 of Douglas County, Washington. Led large, multi-year, 15-site archaeological test excavation, data recovery, and monitoring project in support of FERC permitting for a pool raise. Conducted some faunal, lithic, and sedimentological analyses. Most sites date to the mid-Holocene. Developed research designs, led research team meetings including subcontractors and State, Client, and Tribal officials, produced reports. Work resulted in several scientific articles on paleohydrology, natural resource dynamics, and regional prehistory.

Columbia River Mile 590 Test Excavations, U.S. Army Corps of Engineers and Boise District, U.S. Bureau of Reclamation Okanogan and Douglas Counties, Washington. Managed large, multi-year, multi-site test excavation project, interacted with Tribal officials and Tribal field staff; analyzed faunal remains. Work resulted in multiple scientific articles on archaeology and paleohydrology. In the course of this project, developed a new method for measuring annual growth increments in freshwater mussels that has since been applied to collections from throughout United States.

Kirkwood Bar Archaeological Excavations, Wallowa Whitman National Forest, Idaho County, Idaho. Co-directed excavation and archaeological laboratory activities of largely volunteer staff, maintained project records, conducted analysis of animal remains, including more than 10,000 fish bones; co-authored project report. Site dated to ca 5000 BC.

Hells Canyon Archaeological Inventory, Wallowa County, Oregon, and Idaho and Nez Perce Counties, Idaho, Idaho Power Company. Principal Investigator/Project Manager on multi-year inventory project in support of FERC re-licensing for Hells Canyon Hydropower project. Responsibilities entailed developing and implementing research designs, managing field investigations, documenting and evaluating over 250 prehistoric and 150 historic archaeological properties, assessing erosion and recreation impacts, and developing plans for protection, mitigation and enhancement.

James C. Chatters, Ph.D.
Principal Investigator

Multipurpose Range Complex Archaeological Testing and Data Recovery Excavations, Yakima Training Center, Washington. Principal Investigator: hired and supervised field and laboratory staffs, managed subcontractors, interacted with client and local Indian tribe, analyzed all lithics and animal remains, served as senior author of reports.

Sbabadid and Tualdad Altu Excavations, Renton, Washington; Private Developers. Principal Investigator, field director, and faunal analyst for data recovery excavations at protohistoric and prehistoric village sites in an urban setting. Sbabadid contained a long house dated between 1790 and 1910 AD. Interacted extensively with leadership of Duwamish tribe. Tualdad Altu contained an extensive bird, fish, mammal, and mollusk fauna from a freshwater marsh and estuarine habitats.

Cultural Resources Program, DOE Hanford Site, Washington, Project Manager. Coordinated cultural resources regulatory compliance for DOE's Hanford Site. Conducted inventories of buildings and archaeological sites under Sections 110 and 106 of the National Historic Preservation Act. Supervised periodic site monitoring. Conducted National Register of Historic Places evaluations, findings of effect, findings of adverse effect, and nominations. Interacted with members of five Native American tribes, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation

Consulting Faunal Analyst covering Washington, Oregon, Idaho, California, Alaska. Under subcontracts, identified vertebrate and invertebrate remains from archaeological sites in the Owens Valley and Orange and Shasta Counties, California, Oregon, Southern Idaho, the Puget Sound, and Alaska. Studies included analyzing seasonality of freshwater mussels from the Mojave Desert, and Owens and Sacramento River Basins.

PUBLICATIONS AND REPORTS

Prentiss, W. and J. C. Chatters. In Press. 2003. Cultural Diversification and Decimation in the Prehistoric Record. *Current Anthropology*, scheduled publication, February.

Reid, K. C., J. D. Gallison and J. C. Chatters. In Press. *Archaeology at Deep Gully: Excavations at Two Stratified Middle Holocene Camps on Kurry Creek, Hells Canyon National Recreation Area, West Central Idaho.* Archaeological Monograph 2, Idaho Historical Society, Boise, Idaho.

Chatters, James C., D. Davy, J. Fogerty, and D. Fleming. 2002 *Phase II Cultural Resource Evaluation for Management Region 5, Part 1, Edwards AFB, Kern, Los Angeles, and San Bernardino Counties, California.* Prepared for U. S Army Corps of Engineers, Sacramento District by Foster Wheeler Environmental Corporation, Sacramento, California.

Chatters J.C. 2001. *Ancient Encounters: Kennewick Man and the First Americans.* Simon & Schuster, New York.

James C. Chatters, Ph.D.
Principal Investigator

Chatters, J. C. 2000. The Discovery and Initial Analysis of the Skeleton Known as Kennewick Man. *American Antiquity*. 65:261-316.

Chatters, J. C., and D. A. Roshto. 1999. Faunal Remains from Two sites in Orange County, California: CA-Ora-1465 and CA-Ora-1480. In D. Davy, appendix.

Chatters, J. C., and J. C. Cleland. 1998. Conclusions: Environment, Population, and Human Adaptation on the Middle Pit River. In J.C. Cleland (ed.) *Prehistory of the Middle Pit River, Northeastern California*. Prepared for Pacific Gas and Electric by KEA, Inc. San Diego, California.

Chatters, J. C, and D. Pokotylo. 1998. An Introduction to Plateau Prehistory. In D. E. Walker (ed). *Handbook of North American Indians: Volume XII, the Plateau*. Smithsonian Institute, Washington, D.C.

Chatters, J. C. 1998. Environment. In D. E. Walker (ed). *Handbook of North American Indians: Volume XII, the Plateau*. Smithsonian Institute, Washington, D.C.

Chatters, J. C. 1998. Faunal Analysis. In D. M. Davy and J. Nachmanoff, Appendix D. *Archaeological Data Recovery Excavations, Bugge Spit Site, 45-JE-06*. Prepared for US Department of the Navy by Foster Wheeler Environmental Corporation, Sacramento, California.

Chatters, J. C. 1995. Population Growth, Climatic Cooling, and the Development of Collector Strategies on the Southern Plateau, Western North America. *Journal of World Prehistory*. 9:341-400.

Chatters, J. C., S. K. Campbell, G. Smith, and P. E. Minthorn. 1995. Bison Procurement at Tsulim: A 2100 Year-Old Kill Site on the Columbia Plateau. *American Antiquity*. 60: 751-763.

Butler, V. L., and J. C. Chatters. 1994. The Role of Bone Density in Structuring Prehistoric Salmon Bone Assemblages. *Journal of Archaeological Science*. 21: 413-424.

Chatters, J. C., and K. A. Hoover. 1992. The Response of the Columbia River Fluvial System to Holocene Climatic Change. *Quaternary Research*. 37:42-59.

Chatters, J. C. 1989. The Antiquity of Economic Differentiation within Households in the Puget Sound Region, Northwest Coast. In , S. MacEachern, D. J. W. Archer and R. D. Garvin (eds.), pp. 168-178. *Households and Communities*. University of Calgary, Alberta.

Chatters, J. C. 1987. Hunter-Gatherer Adaptations and Assemblage Structure. *Journal of Anthropological Archaeology*. 6:(336-375).

James C. Chatters, Ph.D.
Principal Investigator

Chatters, J. C., and K. A. Hoover. 1986. Changing Late Holocene Flooding Frequencies on the Columbia River, Washington. *Quaternary Research*. 26:309-320. J. C. Chatters and K.A. Hoover.

Chatters, J. C. (ed.). 1986. *The Wells Reservoir Archaeological Project*. 2 Volumes. Central Washington Archaeological Survey, Archaeological Report 86-6. Central Washington University, Ellensburg.

Chatters, J. C. 1984. *Human Adaptations along the Upper Columbia River, 4700-1600 BP*. Central Washington University, Graduate Studies and Research

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

EXPERIENCE SUMMARY

Twenty years of experience in cultural resources management including prehistoric and historic archaeology, traditional cultural properties, and historic architecture and engineering. Sixteen years experience as a manager of archaeological field projects in support of regulatory compliance programs for energy, transportation, mineral and water resources development, and hazardous materials management projects.

EDUCATION

Ph.D., Archaeology, Southern Illinois University, Carbondale, 1982
M.A., Ethnology, Southern Illinois University, Carbondale, 1978
B.A., Anthropology, University of California, Santa Cruz, 1970

TRAINING

General Services Administration, Federal Projects and Historic Preservation Law
Project Management Training, Series 100, 200, 300, Foster Wheeler Environmental Corporation

CERTIFICATION

Register of Professional Archaeologists, 1999 (SOPA since 1985)

REPRESENTATIVE PROJECT EXPERIENCE

Eastern Transportation Corridor; Transportation Corridor Agencies. Project Archaeologist for 24-mile-long multi-lane toll road in Orange County, California. Directed construction monitors, consulted with 5 Native American Tribes, prepared Archaeological Resources Management Plan, and managed test excavation and laboratory analysis program to determine National Register eligibility of 22 archaeological sites discovered during construction. Directed scientific data recovery excavations to mitigate potential impacts to prehistoric rockshelter site and three deeply buried, Early Holocene buried sites discovered during construction.

Cultural Resources Testing and Evaluation for 30 Sites in Management Region 5, Edwards Air Force Base, U.S. Army Corps of Engineers. Program Manager for archaeological testing and National Register of Historic Places evaluation of 30 prehistoric archaeological sites located in the Precision Impact Range Area at Edwards Air Force Base, California. Prepared archaeological research design and work plan for test excavations and laboratory analysis and served as general editor of final report. Project is part of a long-range sampling program for compliance with Section 106 of the National Historic Preservation Act.

Regulatory Support Program; Federal Energy Regulatory Commission. Prepared Environmental Impact Statements and Environmental Assessments and conducted agency consultation to ensure compliance with Section 106 of the National Historic Preservation Act for hydroelectric projects in western United States in support of FERC staff. Prepared four major EISs and four EAs for hydroelectric projects in California, Oregon, Washington, Idaho, Nebraska, and Wisconsin. Prepared cultural resources portions of FERC's Licensing Handbook

and Relicensing Handbook. Assessed potential effects of licensing or relicensing on large and complex hydroelectric projects and associated irrigation canals, powerhouses, dams, and electric transmission lines. Prepared Memorandum of Agreement between FERC, State Historic Preservation Office, and Advisory Council on Historic Preservation, and managed Section 106 compliance for Star Falls Hydroelectric Project.

Integrated Cultural Resources Management Plans, U.S. Army Corps of Engineers. Project Manager for preparation, under separate task orders, of Integrated Cultural Resources Management Plans for four military installations: Sierra Army Depot, northern California; Deseret Chemical Depot, Utah; Naval Weapons Station, Seal Beach, southern California; and Naval Weapons Station, Fallbrook Detachment. Each of the plans involved an assessment of regulatory compliance plans and procedures for Section 106 of the National Historic Preservation Act and other regulations at each installation and development of recommendations for continued regulatory compliance and future work.

Vancouver to Sacramento Fiber Optic Conduit Installation Project, 360networks, Incorporated. Project Archaeologist for long-haul fiber optic conduit installation program between Vancouver, Washington, and Sacramento, California. Consulted with Federal agencies and Native American Tribes, prepared Archaeological Resources Treatment Plans, agreement documents, and heritage resources inventory reports; directed archaeological field survey and test excavations; and managed team or archaeologists and Native Americans monitoring construction. Coordinated with agencies in emergency discovery situations.

Statewide Historic Buildings and Structures Inventory, DoD Installations, State of California; U.S. Army Corps of Engineers, Sacramento District. Project Manager for inventory and overview of buildings and structures surveys for 93 military bases in California. Prepared inventory and analysis of studies and coordinated with team of Architectural Historians. Authored one of three report volumes. Project involved literature search and historic context development for California as a region and for the Cold War and Korean War periods. The resulting report serves as a guide for all future historic buildings and structures inventories in California. Project review committee included representatives of the four military service branches, State Historic Preservation Office, Advisory Council on Historic Preservation, and National Park Service. This project won the Governor's Historic Preservation Award for 2001.

Northend Landfill Capping and Shoreline Protection Project; Naval Ordnance Center Pacific Division, U.S. Navy Engineering Field Activity Northwest. Project Archaeologist for landfill capping and shoreline protection project. Conducted test investigations to determine National Register eligibility of prehistoric shell midden site, consulted with 5 Native American tribes, prepared Archaeological Resources Treatment Plan for data recovery to mitigate adverse effects on a prehistoric archaeological site. Directed scientific data recovery excavation as a mitigation measure at buried site in tidal zone. Prepared Memorandum of Agreement between the Navy, State Historic Preservation Office, Native American Tribes, and Advisory Council on Historic Preservation.

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

Devil's Nose/Cross County Water-Power Project FERC License Application; Amador County Water Resources Agency. Project Archaeologist for cultural resources field inventory, National Register criteria evaluation, and Native American consultation, for a 121-MW water supply reservoir and hydroelectric project involving a 1,000-acre reservoir in central California. Directed archaeological survey, recorded archaeological sites and conducted field program to determine their eligibility for listing on the National Register of Historic Places. Coordinated cultural resources management activities with U.S. Forest Service, Office of Historic Preservation, Native American tribes, and other agencies.

Historic Properties Survey of Selected Areas at Fort Peck Lake; U.S. Army Corps of Engineers, Missouri River Division. Project Manager for archaeological survey of 4,000 acres at Fort Peck Lake, eastern Montana as a technical study in support of the EIS for the Missouri River Master Water Control Manual. Recorded 49 archaeological sites and analyzed reservoir shoreline erosion effects on historic properties. Field Director and principal author for survey for compliance with Section 106 of the National Historic Preservation Act in conjunction with the Missouri River Master Water Control Manual Environmental Impact Statement.

Kelso-Beaver Pipeline FERC License Application; Portland General Electric Company. Project Archaeologist for FERC license application for a 17-mile-long natural gas pipeline in southwestern Washington and northwestern Oregon. Conducted a records search, literature search, and field surveys and consulted with four Native American groups and the State Historic Preservation Office for Section 106 National Historic Preservation Act compliance.

Sly Park Flashboards EA; El Dorado Irrigation District. Project Archaeologist for National Register criteria evaluations of two prehistoric sites located on the shorelines of a reservoir in east-central California for reservoir expansion project. Planned and directed archaeological excavations to evaluate the sites, and prepared site evaluation report. Consulted with the Bureau of Reclamation, State Historic Preservation Office, and Native American tribes.

Piñon Pine Power Project; Sierra Pacific Power Company. Project Archaeologist for historic properties survey and site evaluation program for a coal gasification project in west-central Nevada. Conducted field survey to identify sites, and directed test excavations to evaluate the National Register eligibility of a prehistoric archaeological site. Consulted with Native American tribe and State Historic Preservation Office for Section 106 National Historic Preservation Act compliance on behalf of the Department of Energy.

Sutter Energy Center, Calpine Corporation. Project Archaeologist for California Energy Commission Application for Certification for merchant thermal power plant and 30 miles of natural gas and electrical transmission facilities. Planned and conducted cultural resources inventories and prepared license application. Prepared Application for California Energy Commission and cultural resources inventory report to meet Section 106 National Historic

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

Preservation Act requirements for Western Area Power Administration. Prepared Monitoring and Mitigation Plan and supervised construction monitoring of natural gas pipeline.

Columbia River System Operation Review EIS; Bonneville Power Administration. Prepared an EIS evaluating 21 alternatives for the reoperation of the 14 federal dams on the Columbia and Snake river systems. Analyzed potential effects of project operational alternatives on archaeological sites and Native American traditional cultural properties. Authored computer program to analyze reservoir fluctuation effects on archaeological sites and data analysis chapters of technical appendix to EIS. Participated in multi-party technical working group with 5 federal agencies and 14 Native American tribes to assess regulatory issues and potential effects of reoperation program.

Benicia Army Cemetery Historic Resources Management Plan; U.S. Army Corps of Engineers. Project Manager for Historic Resources Management Plan and public interpretation plan for Benicia Army Cemetery, the oldest U.S. military post cemetery in the Pacific States. Directed archival research program at National Archives. Prepared an interpretive program for the cemetery.

PUBLICATIONS AND PRESENTATIONS

Davy, D.M. 1999. Early Holocene buried sites in the Tustin Plain. Society for California Archaeology, Sacramento, California.

Davy, D.M., R. Herbert, and J. Carrier. 1998. A Regional and Interservice Approach to Historic Buildings and Structures Evaluation. *Proceedings of the National Defense Industrial Association.*

Davy, D.M. 1995. Simulating reservoir effects on archaeological sites for the Columbia River System Operation Review. Annual Meeting of the Northwest Anthropological Conference.

Davy, D.M. and B.A. Ramos. 1994. A statistical analysis of Gunther Barbed projectile points from two Northern California sites. *Proceedings of the Society for California Archaeology* 7.

Davy, D.M. 1994. River flow regulation as a measure to mitigate the effects of a hydroelectric project on a cultural landscape. Annual meeting of the National Council on Public History.

Davy, D.M. 1980. Borrowed concepts: a comment on Rhoades. *American Antiquity* 45:346-349.

ATTACHMENT 2

QUALITY CONTROL FORMS

SUBMITTAL REGISTER

TITLE AND LOCATION	CONTRACTOR	CONTRACT NO.
Site 73, Naval Weapons Station, Seal Beach, CA	Foster Wheeler Environmental Corporation	N68711-98-D-5713, CTO No. 0023

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	CONTRACTOR SCHEDULE DATES: CLASSIFICATION	CONTRACTOR SCHEDULE DATES: GOVT OR A/E REVWR	CONTRACTOR SCHEDULE DATES: SUBMIT	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY	CONTRACTOR ACTION: ACTION CODE	CONTRACTOR ACTION: DATE OF ACTION	DATE FWD TO APPR AUTH/DATE RCD FROM CONTR	APPROVING AUTHORITY: DATE FWD TO OTHER REVIEWER	APPROVING AUTHORITY: DATE RCD FROM OTH REVIEWER	APPROVING AUTHORITY: ACTION CODE	APPROVING AUTHORITY: DATE OF ACTION	MAILED TO CONTR/DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
	1	4.1	Clean fill for backfill placement			DON/FWENC ESQ											
	2	4.3	Surveying data pre-excavation			DON											
	3	4.6	Surveying data post-excavation			DON											
	4	4.1	Compaction testing			DON/FWENC											
	5		Final reports			DON Agencies											
	6	4.3	Geophysical survey			DON											
	7	5.2.7	Waste disposal manifests			DON/FWENC ESQ											

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 500
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)

CONTRACT NO N68711-98-D-5713	TITLE AND LOCATION	DATE REPORT NO
CONTRACTOR FOSTER WHEELER ENVIRONMENTAL CORPORATION	SUPERINTENDENT	
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	TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS
WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO	

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

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

REPORT NO

PHASE | CONTRACT NO N68711-98-D-5713, CTO No. 0023 | 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

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

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

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.: N68711-98D-5713, CTO No. 0023	Contract Title:

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

REWORK ITEMS LIST

Contract No.	CTO No.	Project Title and Location	Contractor
N68711-98-D-5713	0023		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

MATERIALS INSPECTION CHECKLIST

Date	
Report No.	

Contract No.: N68711-98D-5713, CTO No. 0023	Contract Title:

Contract Specifications:

Material	Qty	Condition	Testing	Comments

Storage Conditions:

Submittals:

MATERIALS INSPECTION CHECKLIST

Date	
Report No.	

Contract No.: N68711-98D-5713, CTO No. 0023	Contract Title:

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.: N68711-98D-5713, CTO No. 0023 | Contract Title:

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.		
10.		

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

NONCONFORMANCE REPORT

Contract No.	CTO No.	Nonconformance Report No.
N68711-98-D-5713	0023	
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
PM:	Hamlet Hamparsumian	
PQCM:	TBD	
QCM:	Mary Schneider	
Site Superintendent:	Glenn Nardin	
Navy RPM:	Si T. Le	
ROICC:	David Crawley	
IR Program Mgr.:	Pei-Fen Tamashiro	
Subcontractor:		

Verification of Disposition ☐ Required ☐ Not Required

By :

Signature _____

Title _____

Date _____

NONCONFORMANCE REPORT LOG

PROJECT TITLE: _____

PROJECT LOCATION: _____

CONTRACTOR: _____

NCR NO.	HOLD TAG NO.	DESCRITION OF CONDITIONS/ ITEM AFFECTED	LOCATION	DATE					REMARKS
				VALIDATION	DISPOSITION/ APPROVAL	RE-INSPECTION	CLOSURE	HOLD TAG REMOVAL	

FOSTER WHEELER ENVIRONMENTAL CORPORATION

FIELD CHANGE REQUEST FORM

Contract No.	CTO No.	Field Change Request Form No.
N68711-98-D-5713		FCRF-
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)

FOSTER WHEELER ENVIRONMENTAL CORPORATION

FIELD CHANGE REQUEST FORM

Additional Details

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

☐ Approved.

☐ Not approved (give reason). _____

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

Distribution: Original to Project File, Copy to Site File,
Project Manager, DON RPM, DON ROICC, PQCM, QCM, Site Superintendent

DESIGN CHANGE NOTICE FORM

Contract No.	CTO No.	Design Change Notice Form No.
N68711-98-D-5713	0023	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)	Date	FWENC Project Manager (Signature)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☐ No Comments	
CIH (Signature) (if health and safety related)	Date	Project Scientist (Signature) (if science related)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☐ No Comments	

Distribution:		Date
PM:	Hamlet Hamparsumian	
PQCM:	TBD	
QCM:	Mary Schneider	
Site Superintendent:	Glenn Nardin	
Navy RPM:	Si T. Le	
ROICC:	David Crawley	
IR Program Mgr.:	Pei-Fen Tamashiro	
Subcontractor:	_____	

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

PHOTOGRAPH LOG SHEET

Date Submitted

Roll No.

Contract No.: N68711-98D-5713, CTO No. 0023

Contract Title: Non-Time-Critical Removal Action IRP Site 73 (Water Tower Area) Naval Weapons Station Seal Beach, California

Photographer:

Frame	Date	Time	Location/Grid No.	Description/Work No.	Notes
1.					
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31.					
32.					
33.					
34.					

REQUEST FOR ENGINEERING INFORMATION (REI)

Contract No.	CTO No.	REI No.
N68711-98-D-5713	0023	
Project Title and Location	Issue Date	Closure Date

Work Area _____

Subcontractor _____

Applicable Plans, Drawings, Specifications _____

Information Requested _____

Subcontractor Signature _____ Date _____

FWENC Requested _____

Project Engineer Signature _____ Date _____

Project Manager Signature _____ Date _____

Distribution:		Date
PM:	Hamlet Hamparsumian	
PQCM:	TBD	
QCM:	Mary Schneider	
Site Superintendent:	Glenn Nardin	
Navy RPM:	Si T. Le	
ROICC:	David Crawley	
IR Program Mgr.:	Pei-Fen Tamashiro	
Subcontractor:		

REQUEST FOR INFORMATION (RFI)

Contract No.	CTO No.	RFI No.
N68711-98-D-5713	0023	
Project Title and Location	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
PM:	Hamlet Hamparsumian	
PQCM:	TBD	
QCM:	Mary Schneider	
Site Superintendent:	Glenn Nardin	
Navy RPM:	S. Le	
ROICC:	David Crawley	
IR Program Mgr.:	Pei-Fen Tamashiro	
Subcontractor:		

APPENDIX C

MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF THE NAVY AND THE CALIFORNIA STATE HISTORICAL PRESERVATION OFFICER REGARDING INSTALLATION RESTORATION PROGRAM SITE 73 SOIL REMOVAL PROJECT, NAVAL WEAPONS STATION SEAL BEACH, ORANGE COUNTY, CALIFORNIA

DEPARTMENT OF THE NAVY
NAVAL WEAPONS STATION SEAL BEACH
800 SEAL BEACH BOULEVARD
SEAL BEACH, CA 90740-5000

IN REPLY REFER

5758
Ser N45WW/0512

Mr. W. Knox Mellon
State Historic Preservation Officer
P.O. Box 942896
Sacramento, CA 94296-0001

Dear Mr. Mellon:

The Naval Weapons Station Seal Beach has been consulting with Mr. John Sharp of your office on contaminated soil removal (Installation Restoration Site 73) under your project number **USN991124A**. Our letter of July 22, 2002, has been followed up with coordination within which our two agencies have agreed upon the following:

(1) A memorandum of agreement (MOA) shall be executed agreeing to the mitigation for the adverse effect to the archaeological site. This MOA has been drafted and modified by our two agencies and two Navy executed originals are provided as enclosure (1) with our endorsement.

(2) Attachment A of the MOA is the revised version of the data recovery plan. The specific revisions to the data recovery agreed upon include:

a. Section 2.2 and 2.2.1 on *Technical Approach and Excavation* has been revised to reflect a 5% data recovery sample by volume. Also a revision to state the excavation of the 10-centimeter levels shall be measured from the natural contour of the ground surface. Included is the plan for systematic scrapping to recover features that might be missed by auger testing and controlled excavation.

b. Section 2.5 on *Public Outreach* has been changed to reflect that the Navy shall make an offer to present data collected from the data recovery to the City of Seal Beach's Archaeological Advisory Committee. Included is our plan for interpretation of the data from the recovery effort in the form of a display.

c. Section 2.6 on *Curation* includes information on the Naval Weapons Stations agreement for curation of current and further collections.

The City of Seal Beach provided comments to the data recovery plan and our response is provided as enclosure (2). No other interested party comments have been received to date.

Mr. John Sharp's electronic mail dated December 18, 2002, [enclosure (3)] stated upon his return, a letter from your agency would be drafted for your review and consideration, which would state your agencies agreement with our proposed determination of adverse affect with the use of data recovery as mitigation for this affect. Mr. Sharp suggested the MOA and data recovery plan, as modified and executed by our two agencies, could be used to initiate data recovery efforts due to our need to start field work in January 2003.

We request agreement with this approach with your signature of the two originals of the MOA with return of one signed original for our records.

Please contact Lisa Bosalet, Cultural Resources Coordinator, at (562) 626-7637, or e-mail *bosalet.lisa@sbeach.navy.mil*, if further information is required.

Sincerely,

R. A. MIRICK
Captain, U.S. Navy
Commanding Officer

Enclosures: (1) *Memorandum of Agreement Between the Department of the Navy and the California State Historic Preservation Officer Regarding Installation Restoration Site 73 - Soil Removal Project, Naval Weapons Station, Seal Beach, Orange County, CA*

(2) Response to City of Seal Beach Comments

(3) Mr. John Sharp e-mail of December 18, 2002

Copy to:
City of Seal Beach
Attn: Lee Whittenberg
211 Eight Street
Seal Beach, CA 90740-6376

5758
Ser N45WW/0512

Gabrieleno Tongva Tribal Council
P.O. Box 693
San Gabriel, CA 91778-0693

Coalition of the Gabrielino/Tongva People
5450 S. Slauson Ave., Suite 151
Culver City, CA 92030-6000

Coastal Gabrielenos
5776 42nd Street
Riverside, CA 92509-6605

Juaneño Band of Mission Indians
P.O. Box 25628
Santa Ana, CA 92799-5628

Moira Hahn
1732 Harbor Way
Seal Beach, CA 90740-5730

Seal Beach Historical and Cultural Society
P.O. Box 152
Seal Beach, CA 90740-0152

RECEIVED

OHP

MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF THE NAVY AND THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER REGARDING INSTALLATION RESTORATION SITE 73 - SOIL REMOVAL PROJECT, NAVAL WEAPONS STATION, SEAL BEACH, ORANGE COUNTY, CALIFORNIA

WHEREAS, the Department of the NAVY (DON) has determined that the Removal Action, Installation Restoration Program Site 73 (Undertaking), which is described in Attachment A *Archaeological Data Recovery Plan for a Portion of Prehistoric Archaeological Site Ca-Ora-322/1118 to Mitigate Impacts of Soil Removal Remediation, November 30, 2002, Revision 1,* to this Memorandum of Agreement (MOA), located in Naval Weapons Station (NAVWPNSTA), Seal Beach, Orange County, California, will have an adverse effect on archaeological site CA-Ora-322/1118, which has been determined eligible for inclusion in the National Register of Historic Places (National Register) under Criterion D as set forth at 36 CFR 60.4 (historic properties); and

WHEREAS, the DON has consulted with the California State Historic Preservation Officer (SHPO) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), and notified the Advisory Council on Historic Preservation (Council) of the effect finding pursuant to 36 CFR 800.6(a)(1); and

WHEREAS, the DON, in consultation with the SHPO, has determined that adverse effects to CA-Ora 322/1118 will be resolved through the implementation of the stipulations in this MOA; and

WHEREAS, the Gabrieleno Tongva Tribal Council, Coalition of the Gabrielino/Tongva People, Coastal Gabrielenos, and Juaneño Band of Mission Indians (Tribes) have participated in the consultation, will be invited by the DON to participate in the implementation of the terms of this MOA, and should they accept this invitation, will participate in such implementation;

NOW, THEREFORE, the DON and the SHPO agree that if the Undertaking proceeds, the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on the historic property, and further agree that these stipulations shall cover the Undertaking and all of its parts until this MOA expires or is terminated.

STIPULATIONS

The DON shall ensure that the following stipulations are carried out:

I. DEFINITIONS

The definitions provided at 36 CFR 800.16 are applicable throughout this MOA.

II. PROFESSIONAL QUALIFICATIONS AND STANDARDS

A. **Professional Qualifications.** The DON shall ensure that the historic preservation work stipulated in this MOA is conducted by or under the direct supervision of a

person or persons meeting, at a minimum, the Secretary of Interior's *Professional Qualifications Standards* (PQS) in the discipline of archaeology (48 FR 44738-44739). However, nothing in this stipulation may be interpreted to preclude the DON or any agent or contractor thereof from using the properly supervised services of persons who do not meet the PQS.

B. **Documentation Standards**. The DON shall ensure that documentation prepared in partial fulfillment of the stipulations in this MOA is consistent with the *Secretary of the Interior's Standards for Archeological Documentation* and the *Secretary of the Interior's Guidelines for Archeological Documentation* (48 FR 44734-44737), and to the California Office of Historic Preservation's December 1989 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* [Preservation Planning Bulletin No. 4(a)].

C. **Curation and Curation Standards**. The DON shall ensure that the materials and records resulting from the historic preservation work stipulated in this MOA are curated in accordance with 36 CFR 79.

III. AREA OF POTENTIAL EFFECTS

The DON and the SHPO agree that the Undertaking's area of potential effect (APE) is four (4) soil removal units in Installation Restoration Site 73, a six (6) acre area located east of Seal Beach Boulevard, south of the main gate, and west of the parking lot for Building 206, at WPNSTA Seal Beach in Orange County. Attachment A, Figure C-1 through C-3 are maps that show the location and characteristics of the APE.

IV. TREATMENT OF HISTORIC PROPERTIES

The Undertaking will adversely affect CA-Ora-322/1118. The DON shall ensure that the *Archaeological Data Recovery Plan for a Portion of Prehistoric Archaeological Site Ca-Ora-322/1118 to Mitigate Impacts of Soil Removal Remediation, November 30, 2002, Revision 1,* which is Attachment A to this MOA, will be implemented by the DON to take into account the effects of this Undertaking on CA-Ora-322/1118.

V. REPORTING REQUIREMENTS

The DON will prepare a report that documents the results obtained from implementing the measures prescribed in Stipulation IV. The DON shall submit this report in draft to the SHPO, and, at the request of each Tribe, to the Tribes that request it for review and comment. These parties shall have 30 days from receipt to provide the DON with their written comments on the draft report. Failure of these parties to respond within this time frame shall not preclude the DON from finalizing the draft report. Before it finalizes the draft the DON will provide the reviewing parties with *written documentation* indicating whether and how many of their comments will be incorporated in the final report. Unless the reviewing party objects to this *written documentation* within 15 days following receipt, the DON may finalize the draft report as the DON deems appropriate. Thereafter, the DON will promptly distribute copies of the final report to the reviewing parties.

The DON has agreed to create an interpretive display as stated in Attachment A and shall provide documentation of these efforts to the SHPO within 2 years of the completion of the mitigation field work.

VI. HUMAN REMAINS OF NATIVE AMERICAN ORIGIN

If human remains of Native American origin are encountered during implementation of the terms of this MOA, the DON will proceed in accordance with the Native American Graves Protection and Repatriation Act (43 CFR Part 10).

VII. ADMINISTRATIVE PROVISIONS

A. **Confidentiality.** The parties to this MOA acknowledge that the historic property covered by this MOA is subject to the provisions of § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code (Public Records Act) and, having so acknowledged, will ensure that all actions and documentation prescribed by this MOA are consistent with § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code.

B. **Resolving Objections.**

1. Should any party to this MOA object to the manner in which the terms of this MOA are implemented, or to any documentation prepared in accordance with and subject to the terms of this MOA, the DON shall immediately notify the other parties to this MOA of the objection and consult with the objecting party and with the other parties to this MOA for no more than 14 days to resolve the objection. The DON shall reasonably determine when this consultation will commence. If the objection is resolved through such consultation, the action subject to dispute may proceed in accordance with the terms of that resolution. If, after initiating such consultation, the DON determines that the objection cannot be resolved through consultation, the DON shall forward all documentation relevant to the objection to the Council, including the DON's proposed response to the objection, with the expectation that the Council will, within thirty (30) days after receipt of such documentation:

   a. advise the DON that the Council concurs in the DON's proposed response to the objection, whereupon the DON will respond to the objection accordingly; or

   b. provide the DON with recommendations, which the DON will take into account in reaching a final decision regarding its response to the objection; or

   c. notify the DON that the objection will be referred for comment pursuant to 36 CFR 800.7(c), and proceed to refer the objection and comment. The DON shall take the resulting comment into account in accordance with 36 CFR 800.7(c)(4) and Section 110(l) of the NHPA.

2. Should the Council not exercise one of the above options within 30 days after receipt of all pertinent documentation, the DON may assume the Council's concurrence in its proposed response to the objection.

3. The DON shall take into account any Council recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection. The DON's responsibility to carry out all actions under this MOA that are not the subjects of the objection will remain unchanged.

4. At any time during implementation of the measures stipulated in this MOA should an objection pertaining to such implementation be raised by a member of the public, the DON shall notify the parties to the MOA and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this MOA to address the objection.

5. The DON shall provide all parties to this MOA with a copy of its final written decision regarding any objection addressed pursuant to this stipulation.

C. **Amendments.**

1. Any party to this MOA may propose that this MOA be amended, whereupon the parties to this MOA will consult for no more than 30 days to consider such amendment. The amendment process shall comply with 36 CFR 800.6(c)(1) and 800.6(c)(7). If it is not amended, this MOA may be terminated by either signatory party in accordance with Stipulation VII.D, below.

2. Attachment A to this *Final Archaeological Data Recovery Plan For A Portion Of Prehistoric Archaeological Site Ca-Ora-322/1118 To Mitigate Impacts Of Soil Removal Remediation, Revision 1, November 30, 2002,* may be amended through consultation of the parties to this MOA, without amending the MOA proper.

D. **Termination.**

1. If this MOA is not amended as provided for in Stipulation VII.C.1. above, or if either signatory party proposes termination of this MOA for other reasons, the signatory party proposing termination shall, in writing, notify the other parties to this MOA, explain the reasons for proposing termination, and consult with the other parties for at least 30 days to seek alternatives to termination. Should such consultation result in an agreement on an alternative to termination, then the parties shall proceed in accordance with the terms of that agreement.

2. Should such consultation fail, the signatory party proposing termination may terminate this MOA by promptly notifying the other parties to this MOA in writing. Termination hereunder shall render this MOA null and void.

3. If this MOA is terminated hereunder and if the DON determines that the Undertaking will nonetheless proceed, then the DON shall either consult in accordance with 36 CFR 800.6 to develop a new MOA or request the comments of the Council pursuant to 36 CFR 800.

E. **Duration of the MOA.**

ORIGINAL

1. Unless terminated pursuant to Stipulation VII.D. above, or unless it is superceded by an amended MOA, this MOA will be in effect until the DON, in consultation with the other parties to this MOA, determines that all of its stipulations have been satisfactorily fulfilled. Upon a determination by the DON that all of the terms of this MOA have been satisfactorily fulfilled, this MOA will terminate and have no further force or effect. The DON will promptly provide the other parties to this MOA with written notice of its determination and of the termination of this MOA. Following provision of such notice this MOA will be considered null and void.

2. The terms of this MOA shall be satisfactorily fulfilled within 3 years following the date of execution. If the DON determines that this requirement cannot be met, the parties to this MOA will consult to reconsider its terms. Reconsideration may include the continuation of the MOA as originally executed, amendment, or termination.

F. **Effective Date of this-MOA.**

This MOA will take effect on the date that it has been executed by the DON and the SHPO.

EXECUTION of this MOA by the DON and the SHPO, its transmittal by the DON to the Council in accordance with 36 CFR § 800,6(b)(1)(iv), and subsequent implementation of its terms, shall evidence, pursuant to 36 CFR § 800.6(c), that this MOA is an agreement with the Council for purposes of Section I I 0(I) of the NHPA, and shall further evidence that the DON has afforded the Council an opportunity to comment on this Undertaking and its effects on historic properties, and that the DON has taken into account the effects of the Undertaking on historic properties.

SIGNATORY PARTIES:

R. A. MIRICK
Captain, U.S. Navy
Commanding Officer

27 Dec 02
Date

Dr. Knox Mellon
California State Historic Preservation Officer

3 Jan, 2003
Date

ATTACHMENT A

ARCHAEOLOGICAL DATA RECOVERY PLAN FOR A PORTION OF PREHISTORIC ARCHAEOLOGICAL SITE CA-ORA-322/1118 TO MITIGATE IMPACTS OF SOIL REMOVAL REMEDIATION

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

CONTRACT NO. N68711-98-D-5713
CTO NO. 0023

FINAL

ARCHAEOLOGICAL DATA RECOVERY PLAN FOR A PORTION OF PREHISTORIC ARCHAEOLOGICAL SITE CA-ORA-322/1118 TO MITIGATE IMPACTS OF SOIL REMOVAL REMEDIATION

November 30, 2002

Revision 1

NON-TIME-CRITICAL REMOVAL ACTION
INSTALLATION RESTORATION PROGRAM SITE 73
(WATER TOWER AREA)
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1413

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 500
San Diego, CA 92101

James Carl Chatters, Ph.D.
Consulting Cultural Resources Scientist

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ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BNI	Bechtel National, Inc.
B.P.	Before Present
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
DON	Department of the Navy
FWENC	Foster Wheeler Environmental Corporation
IRP	Installation Restoration Program
NAGPRA	Native American Graves Protection and Repatriation Act
NHPA	National Historic Preservation Act
NAVWPNSTA	Naval Weapons Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
Ogden	Ogden Environmental and Energy Services Co., Inc.
SBNWR	Seal Beach National Wildlife Refuge
SHPO	State Historic Preservation Officers
SWDIV	Southwest Division Naval Facilities Engineering Command
USC	United States Code

1.0 INTRODUCTION

The Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV), proposes to conduct a soil removal action to eliminate high concentrations of lead from Installation Restoration Program (IRP) Site 73, also known as the Water Tower Area at Naval Weapons Station (NAVWPNSTA) Seal Beach, Seal Beach, California. This action will be conducted 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). Removal of the soil will adversely affect Archaeological Site CA-Ora-322/1118, which has previously been found to be eligible for the National Register of Historic Places (Clevenger and Crawford, 1997). To mitigate the impact of the planned removal on this archaeological site, the DON has developed a mitigation plan that includes data recovery prior to soil removal and monitoring during the removal process. This plan describes the nature of the impacts, the research design that will guide data recovery, and the technical approach that will be taken to obtain, analyze, and report on recovered data.

1.1 REGULATORY SUMMARY

Two sources of federal cultural resources regulation are pertinent to IRP Site 73 remediation. These are the National Historic Preservation Act (NHPA) and the Native American Graves Protection and Repatriation Act (NAGPRA). The California Environmental Quality Act (CEQA) also applies to IRPs at military bases.

1.1.1 National Historic Preservation Act

The NHPA of 1966 (16 United States Code [USC] 470), as amended, outlines the historic preservation responsibilities of federal agencies. It establishes the Advisory Council on Historic Preservation (ACHP); the National Register of Historic Places, a list of historic and cultural properties of local, regional, or national significance; and a system of State Historic Preservation Officers (SHPOs), whose responsibility is to consult with federal agencies regarding historic properties issues for federal undertakings. Section 106 of the NHPA assigns a responsibility to federal agencies that they consider the effects of their undertakings on historic properties. Section 110 of the act mandates that federal agencies inventory and evaluate historic properties under their care.

The ACHP's implementing regulations, 36 Code of Federal Regulations (CFR), Part 60 and 36, and CFR, Part 800, outline the responsibilities of federal agencies to preserve and protect properties listed on or eligible for listing on the National Register. These include the

responsibility under Section 106 of the NHPA to afford the ACHP the opportunity to comment on any agency undertaking that would have an adverse effect on a historic property. The NHPA defines historic property as any building, district, site, or object that is eligible for listing in the National Register and defines the criteria for this eligibility. Generally, properties are eligible that have significance nationally, regionally, or locally, and that are associated with significant historic events; associated with the lives of historically significant persons; embody the "distinctive characteristics of a type, period, or method of construction;" represent the work of a master; or may contain information important in prehistory or history.

The ACHP's regulations also set forth procedures for federal agencies to determine whether historic properties are present that may be affected by an agency undertaking. The regulations also specify how to consult with the SHPO and the ACHP to determine whether the effects of an agency undertaking on historic properties would be adverse (would negatively impact the qualities of the properties that made them eligible for National Register listing). If the undertaking would cause adverse effects on historic properties, the regulations guide the federal agency in planning measures to avoid or lessen the adverse effect. The consultation process for undertakings found to cause an adverse effect to a historic property generally culminate in the signing of a Memorandum of Agreement between the federal agency, SHPO, and ACHP. The Memorandum of Agreement resolves issues of avoidance or mitigation that have arisen during the consultation process.

1.1.2 Native American Graves Protection and Repatriation Act

The NAGPRA of 1990 (25 USC 3001) assigns ownership and control of Native American burials excavated or discovered on federal or Indian property to Native Americans. It specifies that federal agencies should seek a lineal descendant, or a culturally affiliated tribe or organization for consultation regarding the disposition of Native American burials and associated burial artifacts or grave furniture. This law also requires federal agencies to consult with a lineal descendant, or culturally affiliated tribe or organization regarding the repatriation of any museum collections of Native American burials, funerary objects, or objects of cultural patrimony. In case no lineal descendant or culturally affiliated organization can be identified, the law assigns ownership of newly discovered remains to members of the tribal entity claiming traditional territory at the place of discovery. Regulations implementing the NAGPRA are found in 43 CFR, Part 10.

1.1.3 California Environmental Quality Act

The CEQA is applicable to IRPs on military bases even though its provisions for the protection of historic resources are less stringent than those of the NHPA. Historic preservation under CEQA stems from Appendix K of the CEQA Guidelines, titled "Archaeological Impacts." Appendix K of the CEQA Guidelines outlines the criteria for defining properties as important

archaeological or historic resources and recommends the application of measures to mitigate potentially adverse impacts to such properties.

1.2 IRP SITE 73 PROJECT DESCRIPTION

NAVWPNSTA Seal Beach consists of approximately 5,000 acres of land along the Pacific Coast, within the city of Seal Beach in Orange County, California (Figures C.1-1 and C.1-2). NAVWPNSTA Seal Beach is bordered on the southwest by Anaheim Bay, on the north by Interstate 405 (San Diego Freeway), on the east by Bolsa Chica Road, on the west by Seal Beach Boulevard, and on the southeast by an Orange County flood control channel. NAVWPNSTA Seal Beach was originally commissioned in 1944 and is now part of the Commander Navy Region Southwest. Because of its geographic location, the station serves as a supply point for the operating forces of the DON and United States Marine Corps in the southern California region.

IRP Site 73 is a rectangular area of approximately 6 acres, located east of Seal Beach Boulevard, south of the Main Gate, and west of the parking lot for Building 206 (Figure C.1-3). SW1/4 Section 12, T 5 S, R12 W, San Bernardino Meridian; Lat. 33°44′52″ N 118°05′20″ W.) It is the site of the old NAVWPNSTA Seal Beach water tower, which was removed in early 2002. The site is now relatively level, except for a low, circular mound around the water tower footings, where the surface is raised by fill to approximately 3 feet above the surrounding landscape. Present-day vegetation is lawn grass with a scatter of trees and shrubs.

Built in 1944, the water tower has been sand blasted and repainted repeatedly, resulting in a build-up of lead to levels that pose a potential risk to human and environmental health. In response to this situation, the DON has initiated a removal action for the impacted soil at IRP Site 73. The planned removal action for the contaminated soils at IRP Site 73 is excavation and off-site disposal. Because the vertical extent of the contaminated soil appears to be limited to the upper few feet below ground surface, this removal action focuses on soil.

Following a program of systematic soil testing, it has been determined that lead levels are elevated to a level that warrants remediation in four areas of IRP Site 73. These areas include a 70- by 60-foot block surrounding the water tower, a 30- by 40-foot area immediately southeast of the water tower, and two areas, measuring 20 by 50 feet and 20 by 30 feet immediately adjacent to the perimeter fence (Figure C.1-3). The Work Plan for these areas entails removing soil in most areas to a depth of 2 feet, but in the southeast corner of the largest area, under the water tower, excavation may exceed 3 feet. All four of the designated areas are encompassed by the boundaries of Archaeological Site CA-Ora-322/1118 as determined by Ogden Environmental and Energy Services Co., Inc. (Ogden) (Clevenger and Crawford, 1997).

1.3 PHYSICAL SETTING

Physiographically, the project is located near the Pacific Ocean at the seaward edge of the Orange County Coastal Plain (Bechtel National, Inc. [BNI], 2000). The site occupies the south flank of Landing Hill, an uplifted remnant of Pleistocene marine terrace that rises 54 feet above the surrounding terrain. To the west lies the mouth of the San Gabriel River and to the east, the hill looks down upon the marshy estuary known as Anaheim Bay. Aboriginally, the project area was probably a coastal sage scrub, but the land in and around the estuary would have been a mosaic of marshy and grassland habitat that offered site inhabitants a rich array of plant and animal resources.

Today the site is a manicured lawn that surrounds the administrative area of NAVWPNSTA Seal Beach. The entire surrounding area is currently in urban residential or industrial development. The NAVWPNSTA Seal Beach lands to the east are mostly open lands used for munitions storage, leased for agricultural uses, or are salt marsh lands that are part of the Seal Beach National Wildlife Refuge (SBNWR). Land use along Westminster Avenue and Seal Beach Boulevard to the north and west is mostly residential and commercial. Immediately west of the northern part of the NAVWPNSTA Seal Beach is the large Boeing North America corporate campus. Undeveloped lands of the former Hellman Ranch and residential subdivisions lie due west of the NAVWPNSTA Seal Beach.

Native soils consist of the Bolsa silty clay loam with a higher silt content observed at lower depth (CH2M Hill, 2002). These soils are somewhat poorly drained, moderately alkaline, calcareous, and moderately permeable.

1.4 CULTURAL SETTING

It is likely that humans have occupied western Orange County for approximately 11,500 years. The commonly recognized time periods of occupation include four prehistoric periods and the historic period, which dates from the earliest Spanish land explorations to the present.

1.4.1 Prehistoric Setting

The Orange County cultural chronology fits within the larger context of California's prehistoric cultural periods. The most widely cited chronological synthesis (Wallace, 1955) posits four temporal horizons. The concept of "horizon" is used to summarize culture-historical trends within a defined time period and across a large geographical area that seems to have a distinctive spatial and temporal cultural pattern. Horizons are based on the documentation of specific temporally diagnostic items such as projectile points or beads styles. Dates are approximate.

Horizon I (12,000 to 6000 B.P.)

The first inhabitants of Southern California were big game hunters and gatherers exploiting now-extinct species of Pleistocene megafauna (for example, mammoth and other Rancholabrean fauna). The "fluted point" assemblages found in the region and comprised of large spear points or knives are stylistically and technologically similar to those of the Paleo-Indian cultural tradition known as Clovis and dated elsewhere in North America at around 11,500 to 11,000 years Before Present (B.P.) (Moratto, 1984). Approximately 10,000 B.P., at the beginning of the Holocene Period, increasingly warm temperatures, ecosystem change, and human predation caused the extinction of the megafauna. Paleo-Indians were forced to hunt smaller game and rely increasingly on plant food gathering.

Although no direct associations to the big game hunting tradition have been found in southern California, it is represented by a few sites and isolated finds. Early Holocene complexes called Lake Mojave, Silver Lake, and San Dieguito are found along former lake beds and grasslands of the southern desert and coastal regions. Evidence of early Holocene sites in California comes from the Borax and Clear Lake areas (Frederickson and White, 1988), Long Valley (Basgall, 1988), Tulare Lake (Wallace and Riddell, 1988), the Mojave Desert Region (Douglas, et al., 1988; Warren and Phagan, 1988).

Horizon II (Millingstone Period, 6000 to 3000 B.P.)

Plant processing implements (manos, millingstones) designed for exploiting wild plant food resources are much more common in Millingstone Period sites than in earlier sites. Coastal populations show some evidence of marine exploitation during this period. Remains of large terrestrial mammals are relatively rare in archaeological components of this period. Plant foods, especially hard seeds, probably constituted an important part of the economic base, with small game, fish, and shellfish providing secondary subsistence resources.

Sparse populations were apparently organized as extended families and lineages during this period and led a mobile existence to hunt and gather seasonally abundant resources. Other characteristic features of Millingstone Period sites include the use of crude chopping tools, large regionally distinct projectile points, Olivella shell beads, quartz crystals, cogged stones, and earthen roasting pits. Burials were often placed under cairns of whole or broken grinding implements.

In Los Angeles County, the Topanga assemblage represents this horizon and seems to indicate the seasonal use of uplands for harvesting of seed and for game hunting (Moratto, 1984). Tools include scrapers, choppers, hammerstones and a few projectile points. Sites lack shell or bone tools, ornaments, and food vessels.

Horizon III (Intermediate Period, 3000 to 1500 B.P.)

The Intermediate Period is characterized by a continuation of cultural developments from the previous period with an apparent increase in large mammal hunting and greater exploitation of coastal resources. Inland populations still practiced an economy based on hard seed collecting and processing, but possessed a more varied resource base. The introduction of the basket-hopper mortar and the mortar and pestle probably indicates the appearance of intensive acorn use. Wallace notes that the mortar and pestle are considered more efficient in pulverizing the oily, fleshy acorn (Wallace, 1955). Characteristic artifacts include stemmed projectile points, and tools and ornaments of bone, antler, and shell. Faunal remains at coastal sites include land mammals, sea mammals, and shellfish.

Evidence of increased social complexity appears in sites of this period. There is a greater range in site size from large, complex villages to small, temporary camps or workshops. Changing mortuary practices, the use of stone and shell beads, and the long distance trading of steatite all indicate an intensification of social interactions. Villages along the coast and in the interior during this period are larger than those of the Millingstone Period.

Intermediate Horizon sites found inland in Los Angeles and Orange counties do not demonstrate a change as dramatic as the coastal sites. More projectile points and shellfish remains occur in sites of this period, indicating hunting and fishing activity.

Horizon IV (Late Prehistoric Period, 1500 to 200 B.P. [A.D. 1769])

The Late Prehistoric Period is characterized by a larger number of more specialized and diversified sites. There is a dramatic increase in the number of seasonal or temporary camps dating to this period, but a corresponding decrease in the number of large villages. The larger villages served as local centers of activity, with smaller satellite habitations nearby. The village may have functioned as a ceremonial and redistribution center, while the satellites carried out various special economic activities or were seasonal bases for small family bands. Populations during the Late Prehistoric Period were very likely much larger than those during the Intermediate Period. New technologies introduced included the bow and arrow, which replaced the spear thrower (atl-atl) and dart. There was an increase in trade network activity. Further intensification of food production (extracting greater quantities of food from the same land area) may have led to greater sedentism in especially favored areas, such as Newport Bay.

Status-mediated regional trade appears to have been in operation between large permanent village sites. Long-distance trade occurred between California and the American Southwest for ceramics, sea shell, and turquoise. Artifacts showing a high degree of workmanship include: small projectile points, steatite and pottery vessels, circular shell fishhooks, perforated stones, bone tools, stone ornaments, shell and bone ornaments, and the common use of asphaltum.

Some archaeologists speculate that Shoshonean populations (speaking the Takic branch of the Uto-Aztecan language) arrived in southern California between A.D. 500 and A.D. 1000. According to this theory, the Shoshonean speakers displaced coastal Hokan-speaking peoples in Los Angeles, Orange, and northern San Diego to the north and south, thus creating a "wedge" of Shoshonean populations between the existing Hokan populations. This idea is commonly referred to as the "invasion-wedge" theory. Warren (1968) states that small triangular-shaped projectile points are the diagnostic characteristic of this intrusion. These points, however, are also found in non-Shoshonean areas, and the invasion wedge theory is, generally speaking, unproven, and is not universally accepted among archaeologists.

Koerper's (1981) Orange County synthesis, based on work at Ora 119 A, indicated no abrupt change between the Intermediate and the Late Prehistoric Horizon excavation levels. Koerper thus suggests that if intruding Shoshoneans did cause archaeologically detectable change, it may have occurred at the end of the Millingstone Horizon rather than at the end of the Intermediate Horizon, as posited by Warren.

The inhabitants of the project area at the time of earliest European contact were the peoples that the Spanish called Gabrielino. Gabrielino was a Uto-Aztecan language spoken by culturally related tribelets distributed along the California Coast roughly between modern Malibu and Laguna Beach, and inland to the crest of the San Gabriel Mountains (Bean and Smith, 1978). In other words, the Gabrielino occupied all of the Los Angeles Basin, most of the San Fernando Valley, and parts of the Tustin Plain and Santa Ana Mountains. Though estimates of the aboriginal population within Gabrielino territory are very difficult because of the lack of early records and the rapid decline of population in the historic era, Bean and Smith (1978) state that there may have been 50 to 100 mainland villages, each with an average population of 50 to 100.

1.4.2 Landing Hill Sites

Landing Hill is the long and low ridge extending south from a point near the western boundary of NAVWPNSTA Seal Beach toward the Pacific Ocean. There are concentrations of prehistoric shell midden at a number of places on Landing Hill and, over the years, these have been given various archaeological site numbers. Unfortunately, parts of the hill were developed before systematic archaeological survey methods could precisely establish the nature and extent of the various deposits. Also, there has been some confusion about site numbers and site boundaries. Residential and office development has destroyed some sites, for which only older records providing vague information are available.

Generally, understanding of the Landing Hill sites varies by geographic zone, of which there are four: 1) a southwestern zone consisting of the Marina Shores residential area west of Seal Beach Boulevard and south of open fields now used for oil production; 2) a west-central zone extending

from the crest of Landing Hill westward to the Los Alamitos retarding basin, and from Marina Shores north to Adolfo Lopez Drive (formerly Regency Street), which consists of undeveloped, open fields with several oil pumping stations and their access roads, often called the Hellman Ranch property; 3) a northwestern zone extending from Seal Beach Boulevard to the west and from Adolfo Lopez Drive northward to Westminster Avenue that is entirely occupied by the Boeing North America corporate campus; and 4) an eastern zone, consisting of the eastern slopes of Landing Hill on NAVWPNSTA Seal Beach, from the crest at Seal Beach Boulevard and extending downslope to the Anaheim Bay salt marsh. Altogether, 11 sites have been recorded in the Landing Hill Complex, including Archaeological Sites CA-Ora-256, -257, -258, -259, -260, -261, -262, -263, -264, -265/143, and -322/1118. Of these, only Archaeological Site CA-Ora-322/1118 is inside the boundaries of NAVWPNSTA Seal Beach.

1.4.3 CA-Ora-322/1118

Colgrave and Desautels recorded Archaeological Sites CA-Ora-322, located on the eastern margins of Landing Hill in 1971. They defined a site that covered 45,000 square meters by noting the presence of shells in rodent burrow extrusions on lawns. They noted that this site was located near Archaeological Site CA-Ora-260 (which is on the west side of Seal Beach Boulevard) and might be a continuation of it.

Archaeological Site CA-Ora-1118 was recorded as part of an archaeological survey for the Anaheim Bay Mitigation Project (Bissell, 1989). The recorder noted a shell deposit with stone tool waste and a pottery shard located in the Administration Area at NAVWPNSTA Seal Beach. The site was exposed only in narrow construction zones for parking and street repair; however, and its full extent was not determined.

Recent studies, conducted by the DON within the NAVWPNSTA Administration Area (Clevenger and Crawford, 1995; 1997) have determined that Archaeological Sites CA-Ora-322 and -1118 are parts of a single site. A systematic program of shovel testing and test excavations, conducted to determine the content and vertical and horizontal extent of the site, recovered debitage; fish, bird, and mammal bone; large amounts of shell, modified shell; shell beads; groundstone; bifacially worked stone tools; ochre; fire-affected rock; and historic debris. Five radiocarbon dates on marine shell provided an age range of between 2440 B.C. and A.D. 530. Hydration analysis of Coso obsidian produced estimated dates of 1640 B.C. to A.D. 700, which corroborates the radiocarbon dates in placing occupation of the site in the late Millingstone and Intermediate periods.

The excavators identified four areas with distinct stratigraphic sequences, identified as the Upper Northwest, Upper Southwest, Lower Southeast, and Lower Northeast stratigraphic areas. IRP Site 73 includes parts of the Upper Northwest and Upper Southwest stratigraphic areas.

The Upper Northwest area, which extends along Seal Beach Boulevard east of Building 206, contains four distinct strata, including a thin veneer of fill and three natural layers. The uppermost layer, Soil 1, is a sand loam 22 to 30 centimeters thick with high organic content. Soil 2 is described as a brown silt loam, and Soil 3 is described as a yellow-brown silty sand with caliche. Midden is concentrated in Soil 1 and declines with depth. Its distribution was patchy and densities of shell and other artifacts varied considerably from test to test.

The Upper Southeast area occupies the knoll that extends southwest from the water tower into the town of Seal Beach. Shell and artifacts formed a dense concentration in this area, in Soil 1. Soil 1 ranges from as little as 4 centimeters thick along the southern edge of the site, where it has been truncated by disturbance, to 60 centimeters along the edge of the knoll. Soil 1 was underlain in most units by Soil 2, beneath which was Soil 5, a clayey subsoil. Again, midden is concentrated in Soil 1 and drops off markedly in Soil 2. In all cases, midden is most dense in the upper 30 to 35 centimeters of the sequence.

2.0 RESEARCH DESIGN

Since the potential project impact is the removal of significant archaeological deposits, the appropriate mitigation measure is to recover the data those deposits have to offer. Data recovery will consist of obtaining a sample of these deposits using scientific excavation procedures, analyzing those materials, and preparing a report of findings under the stipulations of the following research design.

2.1 RESEARCH QUESTIONS

Rosenthal and Padon (1990) and Stickel (1996) have devised research designs specific to portions of the Landing Hill site complex, which Clevenger and Crawford (1997) modified to encompass all archaeological sites on NAVWPNSTA Seal Beach. Five research realms are identified: Chronology, Subsistence and Settlement, Intra-site Patterning, Trade and Procurement, and Environmental Change. The following research questions are derived from those sources, with minor addition and modification.

2.1.1 Chronology

What is the temporal placement of sites in NAVWPNSTA Seal Beach and what is their age relative to other sites in the vicinity? In relation to Archaeological Site CA-Ora-322/1118, this question can be more focused as:

- When were the different midden concentrations on Landing Hill and within Archaeological Site CA-Ora-322/1118 deposited?
- Were the site and its loci occupied for a single short or long episode or were they occupied episodically during multiple habitation episodes?
- Was the length of occupancy at this site or the loci in IRP Site 73 similar to or different from that of other sites/loci in the area?
- Was the era of occupancy typical of or different from that seen in other sites in the area?

Data required to answer these questions can be obtained through radiocarbon and obsidian hydration dating and from stylistic variations in beads, projectile points, and (possibly) ceramics.

2.1.2 Subsistence and Settlement

What types of subsistence activities did the inhabitants of this site engage in and at what times of year? How did the settlement of this site articulate with the pattern of settlement elsewhere in the Orange County area during the period of site occupancy? More specifically:

- How do subsistence activities, scheduling and procurement of areas identified in this site compare with those for other coastal/estuarine settings in the vicinity?
- If subsistence pursuits and scheduling are different from those of other sites, why do they differ?
- At what time(s) of year was the site occupied? Did people exploit different environments at different seasons of year?
- What sorts of technologies did site occupants employ in the subsistence quest? For example, did they focus on fishing by hook and line, net, harpoon, or some combination of these technologies?

Data needed to answer these questions comes from stone, bone, and shell implements and from faunal and macrobotanical remains (ecofacts). Data on scheduling comes from seasonal growth structures on shellfish and fish otoliths, the presence or absence of seasonally migratory species of fish and birds, and the ages-at-death of prey animals. Information on subsistence pursuits comes from the taxonomic composition of the macrobotanical and faunal assemblages and from tools—hooks, gorges, weights, harpoons, processing equipment, and features—used to exploit them.

2.1.3 Intra-site Patterning

How did people pattern their activities within Archaeological Site CA-Ora-322/1118?

- Is it possible to distinguish dwelling areas from food processing areas, from refuse disposal areas?
- Do different site loci or deposits of different ages exhibit variations in the patterning of site activities?

Data needed to answer these questions is obtainable through the analysis of the vertical and horizontal distribution of functional classes of tools and features.

2.1.4 Trade and Raw Material Procurement

How and where did site inhabitants obtain raw materials and tools and ornaments made by specialists? Generally, people obtain the non-local things needed for ceremony and everyday life through trade or mobility.

- What items and materials did site occupants obtain from outside their home range?
- Did trading/procurement patterns change through time along this portion of the Southern California coast?

Information that can contribute toward answering these questions is obtained through material identification and stylistic analyses of artifacts. In the case of obsidian, X-ray florescence and mass spectrometry are used to identify source quarries.

2.1.5 Environmental Change

As postglacial sea levels have fluctuated, and as the estuaries of the San Gabriel River and Anaheim Bay have silted in and allowed extensive marshes to develop, the occupants of Archaeological Site CA-Ora-322/1118 have faced changes in the local environment. Changes in climate that accompanied sea-level change and followed establishment of modern sea levels have also affected the species composition and productivity of both marine and terrestrial habitats. What was the timing and kind of environmental change experienced by site inhabitants?

It is possible to contribute to answering this question by conducting paleoecological reconstruction of the base environs. This would be accomplished by studying the taxonomic composition of vertebrate and invertebrate collections and pollen samples from midden deposits of different ages. In a study of animal remains from the site, changes in the proportion of terrestrial species versus marine species, at the proportion of deep water estuarine to shallow water estuarine to marine fishes, and at the proportions of shellfish that occupy muddy, sandy, or rocky settings, provide information about the characteristics of the environments from which people obtained their food. A study of pollen from the midden will provide information on changes in local flora in response to climate and changes in local hydrology. This also reflects changes in the environment from which food was obtained.

2.2 TECHNICAL APPROACH

The DON proposes to mitigate project impacts by scientifically excavating a 5 percent sample of the archaeological deposit that will be removed during IRP Site 73 remediation. Artifacts and other cultural materials removed during that process will be subjected to detailed analyses, and a technical report will be completed describing the conduct and results of the effort.

2.2.1 Excavation

Excavation will be a two-stage process. The first stage will be a systematic augering program to locate areas that can best provide answers to one or more of the questions posed above and the second will be excavation of a sample from those areas that auger testing identifies as most promising.

Auger Testing

The midden at Archaeological Site CA-Ora-322/1118 is unevenly distributed. In some areas, Soil 1, which may be the only primary midden deposit in the site, is only 4 centimeters thick, in

others 60 centimeters; some excavation units from the area were nearly devoid of artifacts, debitage, and shell and bone, while others produced large quantities. The DON wishes to focus its attention on the most productive midden areas, so the auger-testing program has been devised to locate them. Auger holes 10 centimeters in diameter will be excavated in 20 centimeters lifts to a depth of up to 1 meter on a 3-meter interval grid placed over each of the four areas designated for soil removal. There will be 104 of such auger holes altogether with a total volume of approximately 1 cubic meter.

- ***Collection of Artifacts.*** Matrix removed from these holes will be screened through 1/8-inch mesh for midden components, which will be tallied in the field and saved for later analysis. Finds will be bagged together in clear, ziplock, polyurethane bags and labeled according to sample type, site, auger unit, level, date, and excavator.
- ***Auger Forms.*** Pit stratigraphy and tallies of midden material will be recorded on auger sample forms and the data transferred to maps displaying the distribution of each midden component. The results of this work will guide the second phase of work.

Data Recovery Excavation

Maps of midden thickness will be used to calculate the total volume of midden in the Area of Potential Effect (APE). Excavation units for data recovery will be selected such that 5 percent of the total midden volume is excavated. On the basis of current information, the volume of the excavation units is estimated at approximately 21.5 cubic meters. Excavations will be conducted in 1-meter square horizontal units, situated singly or in contiguous groups. The fill material that everywhere lies directly beneath the surface will be removed and discarded before scientific excavation begins. Excavation will be in 10-centimeter levels within the site's natural strata, measured from the natural contour of the ground surface. Small, discrete lenses of midden will be excavated as natural units. Excavation will proceed by trowel and dustpan in dense midden material and by shovel where cultural materials are sparse.

- ***Collection of Artifacts.*** Matrix will be simultaneously screened through 1/2- and 1/8-inch wire mesh, with the 1/2-inch mesh nested within the 1/8-inch screen. Shell, lithics, ground stone, bone fragments and fire broken rock will be sorted from the 1/2-inch screen in the field and saved; the residue that remains in the 1/8-inch mesh will be double-bagged, labeled by sample type, site, excavation unit and level, date and excavator, and retained for water screening. From the water screens, we will save all lithics, bone, otoliths, modified shell, the hinges of bivalve mollusks, and the apices of gastropod shells. Each material type from dry or water screening will be bagged separately in clear, ziplock, polyurethane bags and labeled by material, site, unit, level, date, and excavator.
- ***Unit Level Records.*** A unit level form that includes a sketch of the surface at the base of the level, tallies of recovered items, and a description of sediments and other

items of interest will be filed out for each 10 centimeters level of each 1 by 1 meter square. A digital photograph will be taken of the unit surface at the completion of each level.

- ***Features***. The types of features to be excavated include hearths, house floors, cache pits, artifact concentrations, and so forth. The excavation and recordation of these features will follow industry standards, including documenting and recording data, such as provenience, description, depth, and collecting soil and charcoal samples. Each feature encountered in a site shall be given a feature designation sequential for this excavation project. Feature forms will also be used for recording data, observations, and for mapping each feature. Photographs will be taken during the feature excavation process and once exposure of the feature is complete.

- ***Column Samples***. A 10- by 10-centimeter column sample will be taken from each unit. Each 1,000 cubic centimeters of matrix will be placed in a clear, ziplock, polyethylene bag marked with the sample type, site number, unit number, level, date, and contents. The samples will be transported to the laboratory for processing. A subset of these samples will be evaluated later to determine if they produce any charcoal that can be used for macrobotanical analysis.

- ***Radiocarbon Samples***. Samples of material suitable for radiocarbon dating will be collected from features or other in situ contexts. Sample materials will be collected with clean, metal tools and placed in clear, ziplock, polyethylene bags labeled by sample type, site, unit, depth, date, and excavator.

- ***Profiles***. Sidewall profiles will be completed for at least one representative sidewall for each unit and include observed stratigraphy, any disturbance, and soil descriptions and Munsell soil color codes for each stratum. Two hundred cubic centimeter (loose) samples of each stratigraphic layer recognized in the site will be taken for later analysis. Samples taken in series from the same sidewall will be taken from the bottom up and the trowel cleaned between samples to avoid contaminating lower samples with sediment from shallower strata. All samples will be placed in clear, ziplock, polyethylene bags labeled with sample type, site, unit, depth, date, and excavator. These samples will be used later in splits for sedimentological and palynological analyses.

- ***Human Remains***. At all times, there will be at least one staff member in the field who is capable if distinguishing human bones from remains of other vertebrates. The field staff will also keep at least one human osteology text available during all earth disturbing activities. If human remains are encountered, work in the excavation unit will immediately cease and the cultural resources officer for NAVWPNSTA Seal Beach will be contacted. That individual will call the county coroner and initiate NAGPRA procedures for disposition of inadvertent discoveries. Work will not resume in the affected unit or group of open, contiguous units until an agreement on removal and treatment of the remains has been reached.

- ***Exploration for Features.*** Following completion of the 5 percent sample, one-half of the area of the APE that contains midden will be systematically scraped by front loader in approximate 20-centimeter lifts to recover any features that might have been missed during auger testing and controlled excavation. These features will be plotted into the site grid and excavated in the same manner as features found during controlled excavations.

Failure to Locate Midden Deposits

In the event that auger testing fails to locate the expected shell midden or other archaeological material, FWENC will excavate a minimum of five 1-meter square test units to verify the absence of archaeological materials. Two test units will be excavated in Unit A and one each in Units B, C, and D. If this excavation effort also fails to locate archaeological materials, then data recovery efforts will cease. If materials are found, work will continue as described in this plan.

2.3 ANALYSES

Anticipated analyses include faunal, paleoethnobotanical, palynological, lithic, sedimentological, and radiocarbon.

2.3.1 Faunal Analysis

All bones, otoliths, and samples of shells recovered from this site will be identified to the least inclusive taxon possible. Identifications will be made by Dr. James Chatters, a Foster Wheeler Environmental Corporation (FWENC) archaeologist (See resume in Attachment 1), using comparative specimens in his collection, the collections of the Burke Memorial Washington State Museum (western birds) and California State University, Bakersfield (California mammals, fishes). The sample of shells from each excavation level or stratum in each 1 meter square unit selected for identification will be 2 liters or 20 percent of the total volume, whichever is greater. When a stratum contains less than 2 liters of shell, all shells in the assemblage will be identified. Bones will be cleaned and sorted by class, then analyzed. Analysis will record taxon (family, genus, species), element, portion of element, side, age, and modification (burning, butchering marks, gnawing, shaping). Results will be statistically manipulated to determine what environments the site's inhabitants were exploiting, at what times of year, and whether they were being selective in their use of anatomical parts of their prey species (butchering practices). Bone and shell tools and ornaments will be included in this analysis, and their technological attributes and wear patterns will be recorded in addition to the above data.

Otoliths

Otoliths, if present, will be identified to taxon and subjected to seasonality analysis by the burn and fracture method. That method enhances and exposes the growth rings in an otolith and

measures the distance from the last growth check to the outer surface of the otolith. Only uneroded otoliths will be used for this analysis.

2.3.2 Paleoethnobotanical Analysis

Plant Macrofossils. Soil subsamples of 1 liter (when possible) from column samples and features will be submitted to Paleoresearch Institute, of Golden, Colorado, for flotation analysis and identification of plant tissues and seeds. Samples from both in and outside the site will be included in this analysis to eliminate natural background from the cultural signal. Results will be used to determine which plants were being used as food, which plants were used as fuel, what habitats were being exploited, and at what seasons of the year.

Palynology. Up to 10 sediment samples taken from soil profiles will be subjected to pollen analysis. A subsample of 100 cubic centimeters will be first sent to Paleoresearch Institute for extraction using standard settling and chemical isolation methods. Extracted pollen study will include identifying up to 200 fossil grains per sample, when possible. Identifications will be made from liquid glycerine mounts at 400 and 600x magnification, aided by comparative specimens and published keys.

2.3.3 Lithic Analysis

Lithic analyses will be conducted which will include identification of raw material and reduction stage for debitage, and functional and wear patterns analysis for tools. An attempt will be made to identify the sources of lithics used, and if obsidians are found, they will be submitted for source identification through x-ray florescence.

2.3.4 Sedimentology

Samples of sediment will be subjected to textural analysis and the results used along with stratigraphic descriptions to interpret the sedimentary history of the site.

2.3.5 Radiocarbon Dating

Samples of marine shell and/ or charcoal suitable for radiocarbon dating will be given an initial cleaning in the laboratory and submitted for chronometric analysis to one of two laboratories. If they are large enough for conventional decay dating (5 grams charcoal, 30 grams shell), they will be submitted to Beta Analytic of Coral Gables, Florida. If they are so small that accelerator mass spectrometry must be used, they will be submitted to the University of California, Riverside or Stafford Research Laboratories of Boulder, Colorado.

2.3.6 Ceramic Analysis

Ceramic sherds will be analyzed. Ceramic analysis will include conducting macroscopic analysis to determine ceramic type, type of temper used, and examination of the paste. Ceramic analysis will also include listing any diagnostic attributes, record sherd measurements and if possible, determining the vessel type and recording the method of construction used to make the vessel as well as indicating any surface treatments.

2.3.7 Obsidian Hydration and Obsidian Sourcing

If obsidian is collected during excavations, up to 25 specimens will be submitted to a commercial obsidian hydration laboratory for hydration dating and sourcing.

2.3.8 Cataloging Collected Material

All collected materials will be cataloged. All collected artifacts, ecofacts, and samples will be cataloged, as individual items or in lots, as appropriate. Cataloged items will be numbered sequentially using the site number as the accession number. Cataloging sheets will be processed to produce both a letter-quality printed original and an Access file on 3 1/2-inch high-density (1.44 MB) diskettes. Diskettes will be labeled and include an ASCII file. These catalog sheets and diskettes will be included as appendices in the final report.

2.3.9 Conservation

All artifacts, ecofacts, and samples will be subjected to appropriate conservation in the field and lab including proper packages, handling of samples, and handling of perishable and fragile materials. Samples will be packaged for transport from the field to the laboratory in a manner appropriate for each sample type to prevent damage in transit and during storage. Each sample type shall be handled in a standardized manner to prevent contamination. Perishable and fragile materials requiring special conservation, unless such skills are available within staff personnel, will be stabilized for shipment to a conservator.

2.4 REPORTING

The report of findings will follow California Parks and Recreation Commission Archeological Resource Management Report guidelines and will, at a minimum, include the following:

- An introduction describing the IRP Site 73 project and site, with a regional and site map
- Description of the project and site, with maps
- Photographs showing the site context and the site deposits

- Overview of the project area's natural and cultural history and cultural chronology and a review of previous archaeological research in the locality and region
- Description of previous research conducted Archaeological Site CA-Ora-322/1118
- Research design developed for Archaeological Site CA-Ora-322/1118
- Description of investigation and analysis methods
- Description of the test pits and data recovery excavations, including maps, drawings, stratigraphic profile, photographs, artifacts, and soils and geomorphological analysis
- Illustrations of functionally or temporally diagnostic artifacts
- Description and analysis of the laboratory test results
- Interpretations of the analyses and site deposits in the context of scientific research questions, hypotheses, and theories about prehistoric and/or protohistoric lifeways using the research design
- Appendices containing the site catalog, and technical reports by any outside experts

The draft report will be provided to the DON for review and comment within 60 days of the completion of the laboratory analyses. The DON may elect to submit copies of the draft to the SHPO, representatives of the Gabrielino community. The DON will submit copies of the draft to the Archaeological Advisory Committee of the City of Seal Beach for review and comment. The comments of the reviewers will be responded to and a final report will be prepared following the approval of a draft by the Contracting Officer Representative. A complete camera-ready original and two copies will be provided to the DON.

2.5 PUBLIC OUTREACH

Results of data recovery investigations will be presented to the Restoration Advisory Board that oversees remediation work at NAVWPNSTA Seal Beach. If requested by the Archaeology Advisory Committee of the City of Seal Beach, the DON will conduct a public presentation on findings of the excavation in a lecture format at a suitable location in the City of Seal Beach.

2.6 CURATION

Upon acceptance by the DON of the final archaeological report, all artifacts and records from the project, cataloged and in containers with labels meeting repository specifications, will be turned over to a federally approved repository for curation. A DON letter, dated September 17, 2002, pertaining to DON cooperation with federal curation regulations, along with the statement of work, curation, storage, and collections management letter of agreement are included in Attachment 2.

3.0 REFERENCES

Basgall, M. 1988. The Archaeology of Ca-Mno-679: a Pre-Archaic Site in Long Valley Caldera, Mono County, California. In Early Human Occupation in Far Western North America: the Clovis-Archaic interface, edited by J.A. Willig, C.M. Aikens, and J.L. Fagan. Nevada State Museum Anthropological Papers 21.

Bean, L.J. and C.R. Smith. 1978. Gabrielino. In Handbook of North American Indians, Volume 8: California. Smithsonian Institution, Washington, D.C.

Bechtel National, Inc. (BNI). 2000. *Draft Removal Site Evaluation Report, Installation Restoration Program Sites 4, 5 and 6, Naval Weapons Station, Seal Beach, California.* June.

Bissell, R.M. 1989. *Cultural Resources Reconnaissance of Fill Area, Anaheim Bay Mitigation Project, HD-S1670.* Naval Weapons Station Seal Beach, Orange County, California.

CH2M Hill. 2002. *Draft Final Focused Site Inspection Phase II Report, Naval Weapons Station, Seal Beach, California.* Volumes 1 and 2. 28 January.

Clevenger, J.M. and K. Crawford. 1995. *Draft Phase I overview survey and Phase II archaeological, historical, and architectural evaluation of cultural resources on the Naval Weapons Station, Seal Beach.* Report prepared for the Department of the Navy, Southwest Division, Naval Facilities Engineering Command, San Diego by Ogden Environmental and Energy Services, San Diego.

Clevenger, J.M. and K. Crawford. 1997. *Historic Properties Overview and Evaluations on the Naval Weapons Station, Seal Beach.* Report prepared for the Department of the Navy, Southwest Division, Naval Facilities Engineering Command, San Diego by Ogden Environmental and Energy Services, San Diego.

Desautels, R. 1981. Archaeological Test Report on the Hellman Property located in Seal Beach, California.

Douglas, C.L., D.L. Jenkins, and C.N. Warren. 1988. Spatial and Temporal Variability in Faunal Remains from Four Lake Mojave-Pinto Period Sites in the Mojave Desert. In Early Human Occupation in Far Western North America: the Clovis-Archaic Interface, edited by J.A. Willig, C.M. Aikens, and J.L. Fagan. Nevada State Museum Anthropological Papers 21.

Frederickson, D.A. and G.G. White. 1988. The Clear Lake Basin and Early Complexes in California's North Coast Ranges. In Early Human Occupation in Far Western North America: the Clovis-Archaic interface, edited by J.A. Willig, C.M. Aikens, and J.L. Fagan. Nevada State Museum Anthropological Papers 21.

Koerper, H.C. 1981. *Prehistoric Subsistence and Settlement in the Newport Bay Area and Environs, Orange County, California.* Ph.D. Dissertation, University of California, Riverside.

Moratto, M.J. 1984. *California Archaeology*. Academic Press: New York.

Rosenthal, E. J., and B. Padon. 1990. *Research Design for Test Level Investigations and Determination of Site Eligibility at the Hellman Property, Seal Beach, Orange County, California*. Prepared by LSA Associates, Inc. Irvine for Mola Development.

Stickel, E.G. 1991. A Baseline Archaeological Study for the City of Seal Beach, California. Unpublished report on file at the California Historic Resources Inventory, South Central Coastal Information Center, University of California at Los Angeles.

Wallace, W.J. 1955. A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11:214-230.

Wallace, W.J. and F.A. Riddell. 1988. Prehistoric Background of Tulare Lake, California. In *Early Human Occupation in Far Western North America: the Clovis-Archaic Interface*, edited by J.A. Willig, C.M. Aikens, and J.L. Fagan. *Nevada State Museum Anthropological Papers* 21.

Warren, C.N. 1968. Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*. Edited by C. Irwin-Williams. *Eastern New Mexico University Contributions in Anthropology* 1:1-14.

Warren, C.N. and C. Phagan. 1988. Fluted Points in the Mojave Desert: Their Technology and Cultural Context. In *Early Human Occupation in Far Western North America: the Clovis-Archaic Interface*, edited by J.A. Willig, C.M. Aikens, and J.L. Fagan. *Nevada State Museum Anthropological Papers* 21.

FIGURES

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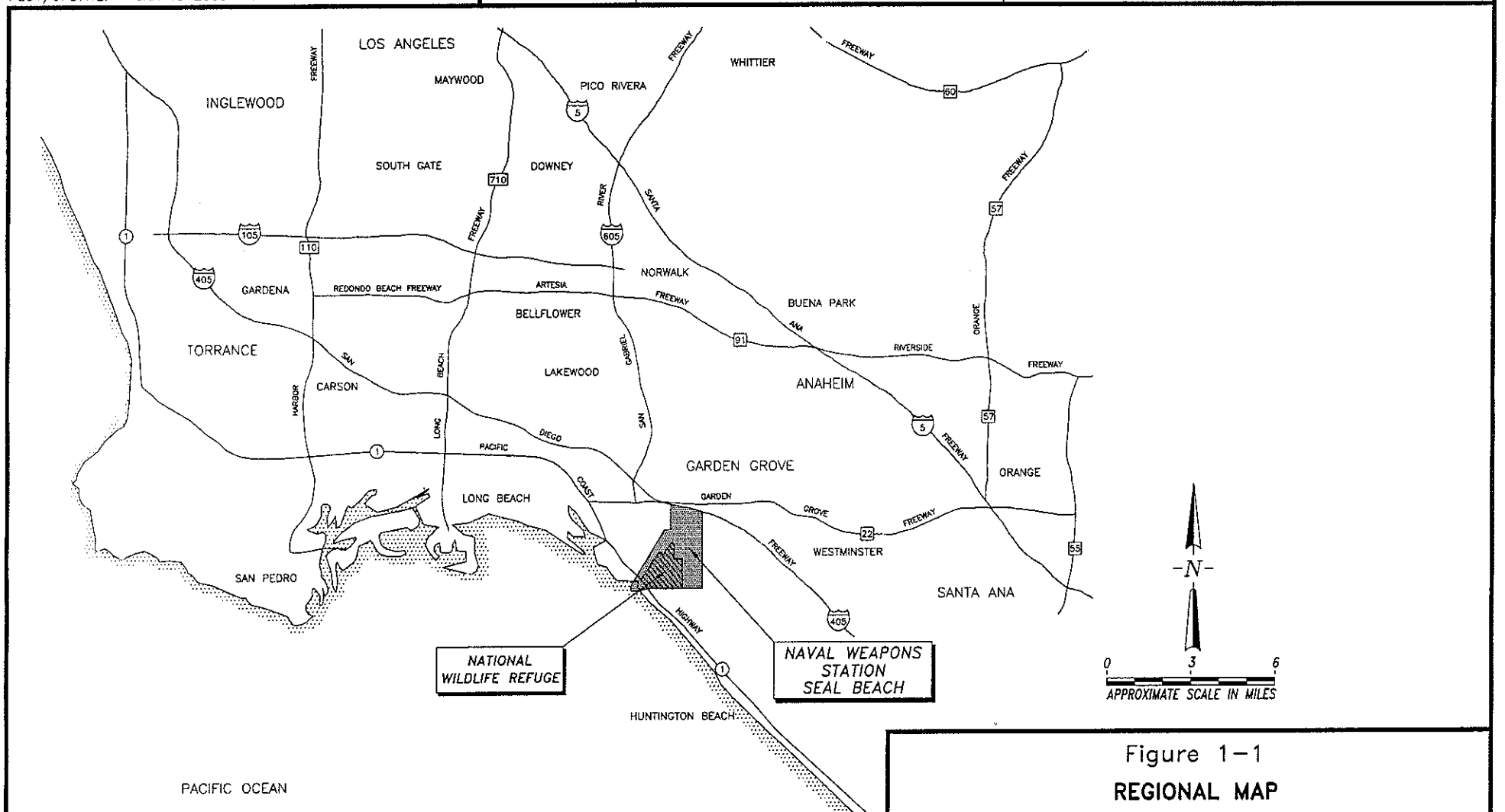

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Figure 1-1

REGIONAL MAP

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

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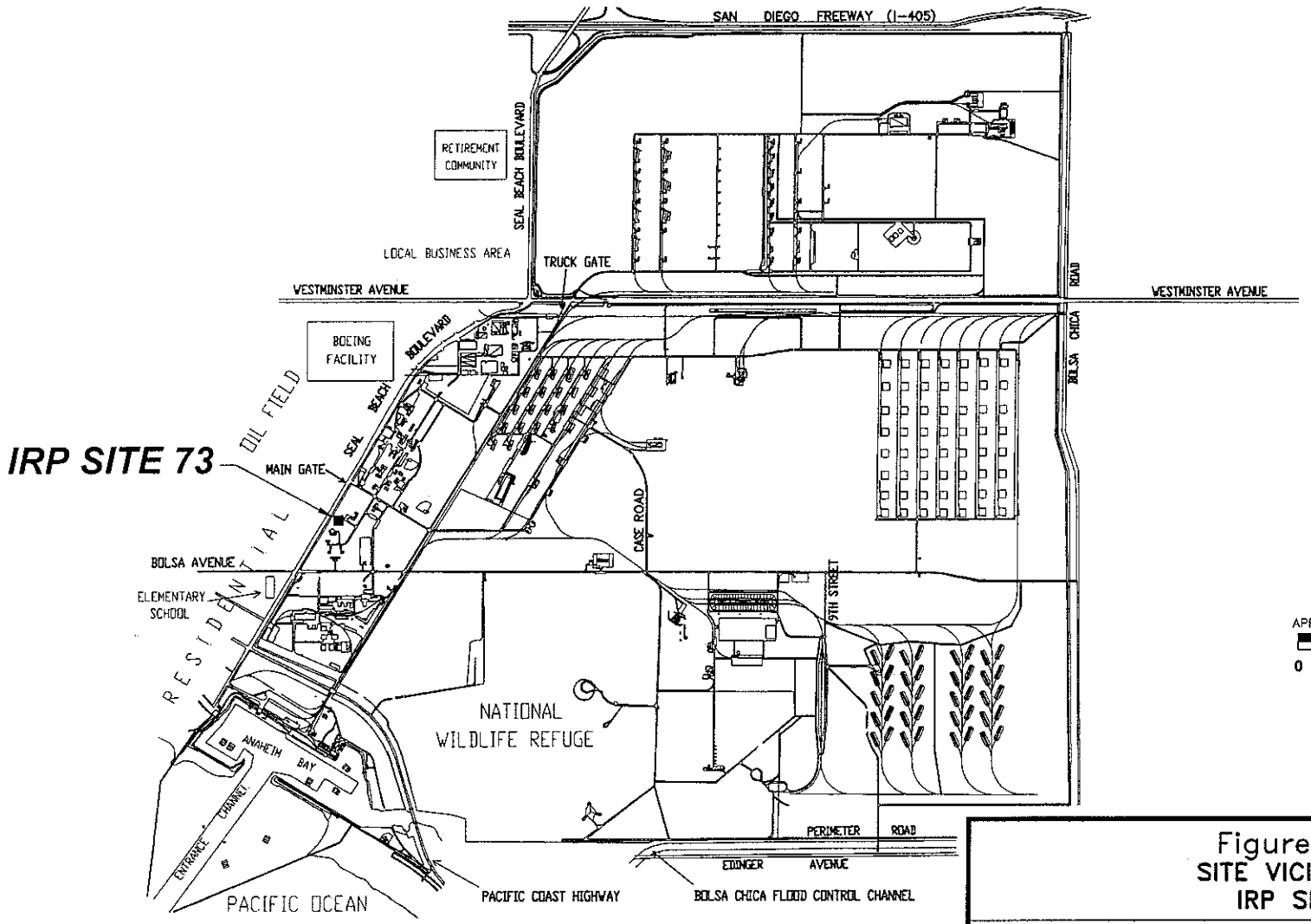
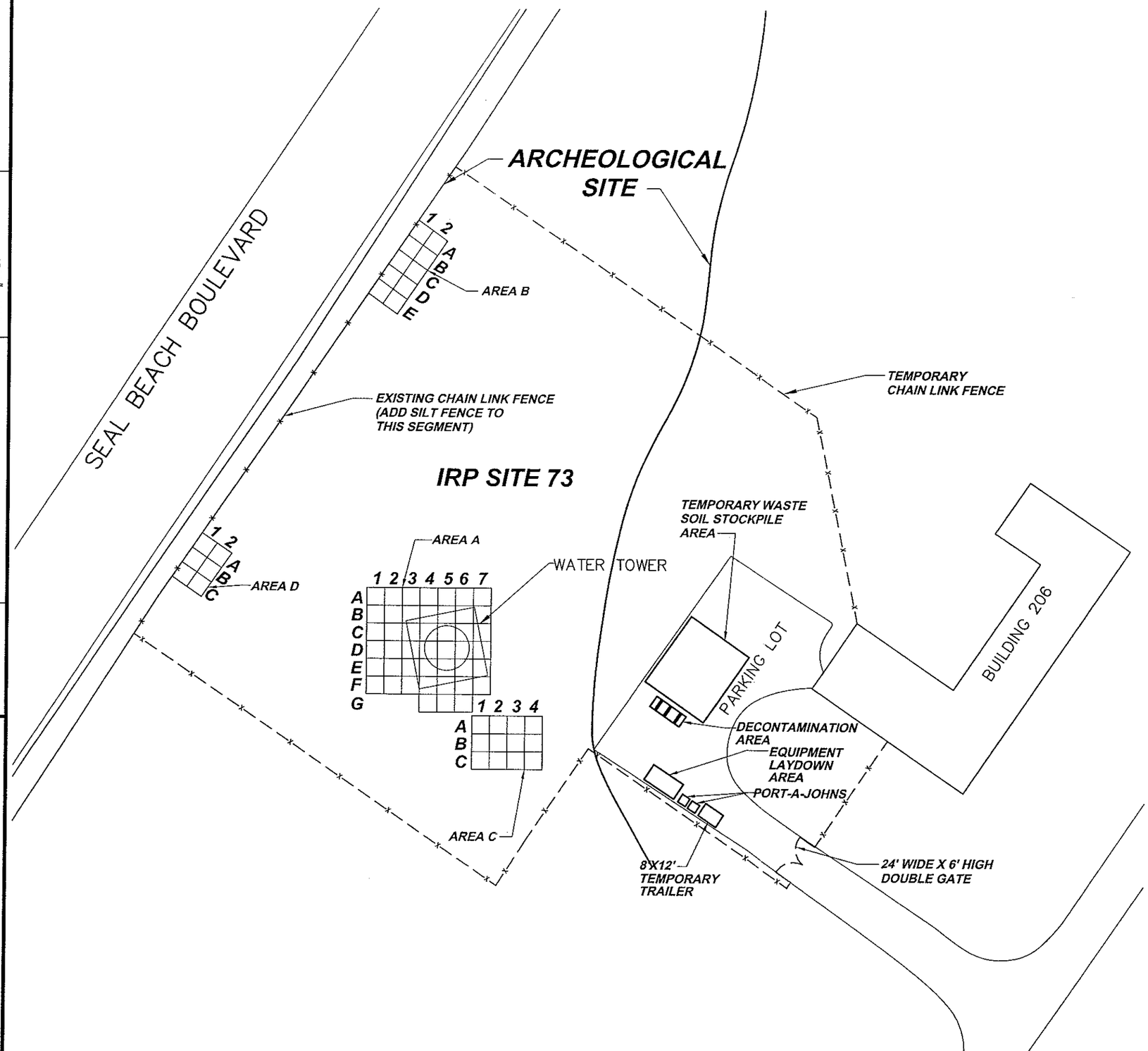


REFERENCE: BNI, 2002.

Figure 1-2
SITE VICINITY MAP
IRP SITE 73

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION



LEGEND

- BUILDING
- ROAD
- CHAIN LINK FENCE

NOTES:

1. GRIDS E4, E5, E6, F4, F5, F6, G4, G5, & G6 EXCAVATED TO APPROX. 3.5 FEET BGS.
2. ALL OTHER GRIDS WILL BE EXCAVATED TO APPROX. 2.0 FEET BGS

Figure 1-3
IRP SITE 73
SITE PLAN

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

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ATTACHMENT 1

RESUMES OF THE PRINCIPAL AUTHORS

James C. Chatters, Ph.D.
Principal Investigator

EXPERIENCE SUMMARY

Dr Chatters took his present role as Foster Wheeler Environmental Corporation's Cultural Resources Lead after operating his own consulting firm and directing cultural resources management programs for the University of Washington, Central Washington University, and Battelle, Northwest. He is a broad-spectrum paleoscientist with extensive experience in the archaeology and paleoecology of the Western United States, having spent 37 years working on archaeological/ cultural resources projects in California, the Great Basin, Pacific Northwest and Great Plains, Alaska, and Hawaii. His work for Federal, State, and local governments and private corporations has ranged from literature surveys, overviews, and cultural resources management plans to large-scale, multi-site data recovery on both prehistoric and historic archaeological sites and districts. That work entailed interaction and consultation with more than a dozen American Indian tribes and a wide range of federal, state, and local regulators. Dr Chatters has disseminated results of his archaeological and paleoecological research in more than 50 project reports, over 40 journal articles and book chapters, and a trade book.

Dr. Chatters work has included a variety of archaeological survey, evaluation, and data recovery projects in California, located in the Sacramento Valley, Southern Coast, Central Coast, Owens Valley, and the Mojave Desert. This group included Encinitas Tradition sites in Orange County and on Vandenberg Air Force Base. He has directed or participated in excavations at more than 20 sites that predate 3000 B.C., and directed data recovery excavations at more than 23 sites. As a faunal analyst he has studied collections of marine and freshwater shellfish and mammal, bird, and fish bone from sites in Orange, Shasta, Butte, Inyo, Kern, San Bernardino, and Santa Clara Counties, California, as well as many parts of Washington, Oregon, Idaho, and Alaska. He is also an experienced human osteologist and has served as a forensic anthropologist for the past seven years.

EDUCATION

Ph.D., Anthropology (Archaeology, Paleoecology), University of Washington, Seattle, 1982
M.A., Anthropology (Archaeology), University of Washington, Seattle, 1976

REPRESENTATIVE PROJECT EXPERIENCE

Cultural Resources Testing and Evaluation for Management Region 5, Edwards Air Force Base, California. As Principal Investigator, completed evaluations and reporting on 30 archaeological sites in the western Mojave Desert, which ranged from Pinto to Late Prehistoric Periods.

East Transportation Corridor Construction Monitoring and Mitigation, Transportation Corridor Agencies of Orange County, California. Identified pollen, animal bone, and marine shells from San Diegito and Encinitas Tradition archaeological sites.

James C. Chatters, Ph.D.
Principal Investigator

Cultural Resources Evaluation, Monitoring, and Data Recovery for Base Fiber Optic System Construction, Vandenberg Air Force Base, California. Managed and supervised archaeological survey, test excavations, and data recovery prior to, and monitoring during, fiber optic line construction. Most interesting site (excavated) dated to the Encinitas Tradition (Millingstone Horizon).

Lake Briton Data Recovery, Pacific Gas and Electric, Shasta County, California. Developed research design, conducted invertebrate faunal analysis (including seasonality), and wrote project synthesis for a large-scale archaeological data recovery project on the Pit River of Northern California.

Site CA-SCL-714/H Data Recovery, Calpine Corp., Santa Clara County, California. Principal Investigator, geoarchaeologist and faunal analyst conducting data recovery from a protohistoric memorial feasting site in former territory of Costanoan peoples.

Wells Reservoir Archaeological Project, P.U.D. no. 1 of Douglas County, Washington. Led large, multi-year, 15-site archaeological test excavation, data recovery, and monitoring project in support of FERC permitting for a pool raise. Conducted some faunal, lithic, and sedimentological analyses. Most sites date to the mid-Holocene. Developed research designs, led research team meetings including subcontractors and State, Client, and Tribal officials, produced reports. Work resulted in several scientific articles on paleohydrology, natural resource dynamics, and regional prehistory.

Columbia River Mile 590 Test Excavations, U.S. Army Corps of Engineers and Boise District, U.S. Bureau of Reclamation Okanogan and Douglas Counties, Washington. Managed large, multi-year, multi-site test excavation project, interacted with Tribal officials and Tribal field staff; analyzed faunal remains. Work resulted in multiple scientific articles on archaeology and paleohydrology. In the course of this project, developed a new method for measuring annual growth increments in freshwater mussels that has since been applied to collections from throughout United States.

Kirkwood Bar Archaeological Excavations, Wallowa Whitman National Forest, Idaho County, Idaho. Co-directed excavation and archaeological laboratory activities of largely volunteer staff, maintained project records, conducted analysis of animal remains, including more than 10,000 fish bones; co-authored project report. Site dated to ca 5000 BC.

Hells Canyon Archaeological Inventory, Wallowa County, Oregon, and Idaho and Nez Perce Counties, Idaho, Idaho Power Company. Principal Investigator/Project Manager on multi-year inventory project in support of FERC re-licensing for Hells Canyon Hydropower project. Responsibilities entailed developing and implementing research designs, managing field investigations, documenting and evaluating over 250 prehistoric and 150 historic archaeological properties, assessing erosion and recreation impacts, and developing plans for protection, mitigation and enhancement.

James C. Chatters, Ph.D.
Principal Investigator

Multipurpose Range Complex Archaeological Testing and Data Recovery Excavations, Yakima Training Center, Washington. Principal Investigator: hired and supervised field and laboratory staffs, managed subcontractors, interacted with client and local Indian tribe, analyzed all lithics and animal remains, served as senior author of reports.

Sbabadid and Tualdad Altu Excavations, Renton, Washington; Private Developers. Principal Investigator, field director, and faunal analyst for data recovery excavations at protohistoric and prehistoric village sites in an urban setting. Sbabadid contained a long house dated between 1790 and 1910 AD. Interacted extensively with leadership of Duwamish tribe. Tualdad Altu contained an extensive bird, fish, mammal, and mollusk fauna from a freshwater marsh and estuarine habitats.

Cultural Resources Program, DOE Hanford Site, Washington, Project Manager. Coordinated cultural resources regulatory compliance for DOE's Hanford Site. Conducted inventories of buildings and archaeological sites under Sections 110 and 106 of the National Historic Preservation Act. Supervised periodic site monitoring. Conducted National Register of Historic Places evaluations, findings of effect, findings of adverse effect, and nominations. Interacted with members of five Native American tribes, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation

Consulting Faunal Analyst covering Washington, Oregon, Idaho, California, Alaska. Under subcontracts, identified vertebrate and invertebrate remains from archaeological sites in the Owens Valley and Orange and Shasta Counties, California, Oregon, Southern Idaho, the Puget Sound, and Alaska. Studies included analyzing seasonality of freshwater mussels from the Mojave Desert, and Owens and Sacramento River Basins.

PUBLICATIONS AND REPORTS

Prentiss, W. and J. C. Chatters. In Press. 2003. Cultural Diversification and Decimation in the Prehistoric Record. *Current Anthropology*, scheduled publication, February.

Reid, K. C., J. D. Gallison and J. C. Chatters. In Press. *Archaeology at Deep Gully: Excavations at Two Stratified Middle Holocene Camps on Kurry Creek, Hells Canyon National Recreation Area, West Central Idaho.* Archaeological Monograph 2, Idaho Historical Society, Boise, Idaho.

Chatters, James C., D. Davy, J. Fogerty, and D. Fleming. 2002 *Phase II Cultural Resource Evaluation for Management Region 5, Part 1, Edwards AFB, Kern, Los Angeles, and San Bernardino Counties, California.* Prepared for U. S Army Corps of Engineers, Sacramento District by Foster Wheeler Environmental Corporation, Sacramento, California.

Chatters J.C. 2001. *Ancient Encounters: Kennewick Man and the First Americans.* Simon & Schuster, New York.

James C. Chatters, Ph.D.
Principal Investigator

Chatters, J. C. 2000. The Discovery and Initial Analysis of the Skeleton Known as Kennewick Man. *American Antiquity*. 65:261-316.

Chatters, J. C., and D. A. Roshto. 1999. Faunal Remains from Two sites in Orange County, California: CA-Ora-1465 and CA-Ora-1480. In D. Davy, appendix.

Chatters, J. C., and J. C. Cleland. 1998. Conclusions: Environment, Population, and Human Adaptation on the Middle Pit River. In J.C. Cleland (ed.) *Prehistory of the Middle Pit River, Northeastern California*. Prepared for Pacific Gas and Electric by KEA, Inc. San Diego, California.

Chatters, J. C, and D. Pokotylo. 1998. An Introduction to Plateau Prehistory. In D. E. Walker (ed). *Handbook of North American Indians: Volume XII, the Plateau*. Smithsonian Institute, Washington, D.C.

Chatters, J. C. 1998. Environment. In D. E. Walker (ed). *Handbook of North American Indians: Volume XII, the Plateau*. Smithsonian Institute, Washington, D.C.

Chatters, J. C. 1998. Faunal Analysis. In D. M. Davy and J. Nachmanoff, Appendix D. *Archaeological Data Recovery Excavations, Bugge Spit Site, 45-JE-06*. Prepared for US Department of the Navy by Foster Wheeler Environmental Corporation, Sacramento, California.

Chatters, J. C. 1995. Population Growth, Climatic Cooling, and the Development of Collector Strategies on the Southern Plateau, Western North America. *Journal of World Prehistory*. 9:341-400.

Chatters, J. C., S. K. Campbell, G. Smith, and P. E. Minthorn. 1995. Bison Procurement at Tsulim: A 2100 Year-Old Kill Site on the Columbia Plateau. *American Antiquity*. 60: 751-763.

Butler, V. L., and J. C. Chatters. 1994. The Role of Bone Density in Structuring Prehistoric Salmon Bone Assemblages. *Journal of Archaeological Science*. 21: 413-424.

Chatters, J. C., and K. A. Hoover. 1992. The Response of the Columbia River Fluvial System to Holocene Climatic Change. *Quaternary Research*. 37:42-59.

Chatters, J. C. 1989. The Antiquity of Economic Differentiation within Households in the Puget Sound Region, Northwest Coast. In , S. MacEachern, D. J. W. Archer and R. D. Garvin (eds.), pp. 168-178. *Households and Communities*. University of Calgary, Alberta.

Chatters, J. C. 1987. Hunter-Gatherer Adaptations and Assemblage Structure. *Journal of Anthropological Archaeology*. 6:(336-375).

James C. Chatters, Ph.D.
Principal Investigator

Chatters, J. C., and K. A. Hoover. 1986. Changing Late Holocene Flooding Frequencies on the Columbia River, Washington. *Quaternary Research*. 26:309-320. J. C. Chatters and K.A. Hoover.

Chatters, J. C. (ed.). 1986. *The Wells Reservoir Archaeological Project*. 2 Volumes. Central Washington Archaeological Survey, Archaeological Report 86-6. Central Washington University, Ellensburg.

Chatters, J. C. 1984. *Human Adaptations along the Upper Columbia River, 4700-1600 BP*. Central Washington University, Graduate Studies and Research

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

EXPERIENCE SUMMARY

Twenty years of experience in cultural resources management including prehistoric and historic archaeology, traditional cultural properties, and historic architecture and engineering. Sixteen years experience as a manager of archaeological field projects in support of regulatory compliance programs for energy, transportation, mineral and water resources development, and hazardous materials management projects.

EDUCATION

Ph.D., Archaeology, Southern Illinois University, Carbondale, 1982
M.A., Ethnology, Southern Illinois University, Carbondale, 1978
B.A., Anthropology, University of California, Santa Cruz, 1970

TRAINING

General Services Administration, Federal Projects and Historic Preservation Law
Project Management Training, Series 100, 200, 300, Foster Wheeler Environmental Corporation

CERTIFICATION

Register of Professional Archaeologists, 1999 (SOPA since 1985)

REPRESENTATIVE PROJECT EXPERIENCE

Eastern Transportation Corridor; Transportation Corridor Agencies. Project Archaeologist for 24-mile-long multi-lane toll road in Orange County, California. Directed construction monitors, consulted with 5 Native American Tribes, prepared Archaeological Resources Management Plan, and managed test excavation and laboratory analysis program to determine National Register eligibility of 22 archaeological sites discovered during construction. Directed scientific data recovery excavations to mitigate potential impacts to prehistoric rockshelter site and three deeply buried, Early Holocene buried sites discovered during construction.

Cultural Resources Testing and Evaluation for 30 Sites in Management Region 5, Edwards Air Force Base, U.S. Army Corps of Engineers. Program Manager for archaeological testing and National Register of Historic Places evaluation of 30 prehistoric archaeological sites located in the Precision Impact Range Area at Edwards Air Force Base, California. Prepared archaeological research design and work plan for test excavations and laboratory analysis and served as general editor of final report. Project is part of a long-range sampling program for compliance with Section 106 of the National Historic Preservation Act.

Regulatory Support Program; Federal Energy Regulatory Commission. Prepared Environmental Impact Statements and Environmental Assessments and conducted agency consultation to ensure compliance with Section 106 of the National Historic Preservation Act for hydroelectric projects in western United States in support of FERC staff. Prepared four major EISs and four EAs for hydroelectric projects in California, Oregon, Washington, Idaho, Nebraska, and Wisconsin. Prepared cultural resources portions of FERC's Licensing Handbook

and Relicensing Handbook. Assessed potential effects of licensing or relicensing on large and complex hydroelectric projects and associated irrigation canals, powerhouses, dams, and electric transmission lines. Prepared Memorandum of Agreement between FERC, State Historic Preservation Office, and Advisory Council on Historic Preservation, and managed Section 106 compliance for Star Falls Hydroelectric Project.

Integrated Cultural Resources Management Plans, U.S. Army Corps of Engineers. Project Manager for preparation, under separate task orders, of Integrated Cultural Resources Management Plans for four military installations: Sierra Army Depot, northern California; Deseret Chemical Depot, Utah; Naval Weapons Station, Seal Beach, southern California; and Naval Weapons Station, Fallbrook Detachment. Each of the plans involved an assessment of regulatory compliance plans and procedures for Section 106 of the National Historic Preservation Act and other regulations at each installation and development of recommendations for continued regulatory compliance and future work.

Vancouver to Sacramento Fiber Optic Conduit Installation Project, 360networks, Incorporated. Project Archaeologist for long-haul fiber optic conduit installation program between Vancouver, Washington, and Sacramento, California. Consulted with Federal agencies and Native American Tribes, prepared Archaeological Resources Treatment Plans, agreement documents, and heritage resources inventory reports; directed archaeological field survey and test excavations; and managed team or archaeologists and Native Americans monitoring construction. Coordinated with agencies in emergency discovery situations.

Statewide Historic Buildings and Structures Inventory, DoD Installations, State of California; U.S. Army Corps of Engineers, Sacramento District. Project Manager for inventory and overview of buildings and structures surveys for 93 military bases in California. Prepared inventory and analysis of studies and coordinated with team of Architectural Historians. Authored one of three report volumes. Project involved literature search and historic context development for California as a region and for the Cold War and Korean War periods. The resulting report serves as a guide for all future historic buildings and structures inventories in California. Project review committee included representatives of the four military service branches, State Historic Preservation Office, Advisory Council on Historic Preservation, and National Park Service. This project won the Governor's Historic Preservation Award for 2001.

Northend Landfill Capping and Shoreline Protection Project; Naval Ordnance Center Pacific Division, U.S. Navy Engineering Field Activity Northwest. Project Archaeologist for landfill capping and shoreline protection project. Conducted test investigations to determine National Register eligibility of prehistoric shell midden site, consulted with 5 Native American tribes, prepared Archaeological Resources Treatment Plan for data recovery to mitigate adverse effects on a prehistoric archaeological site. Directed scientific data recovery excavation as a mitigation measure at buried site in tidal zone. Prepared Memorandum of Agreement between the Navy, State Historic Preservation Office, Native American Tribes, and Advisory Council on Historic Preservation.

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

Devil's Nose/Cross County Water-Power Project FERC License Application; Amador County Water Resources Agency. Project Archaeologist for cultural resources field inventory, National Register criteria evaluation, and Native American consultation, for a 121-MW water supply reservoir and hydroelectric project involving a 1,000-acre reservoir in central California. Directed archaeological survey, recorded archaeological sites and conducted field program to determine their eligibility for listing on the National Register of Historic Places. Coordinated cultural resources management activities with U.S. Forest Service, Office of Historic Preservation, Native American tribes, and other agencies.

Historic Properties Survey of Selected Areas at Fort Peck Lake; U.S. Army Corps of Engineers, Missouri River Division. Project Manager for archaeological survey of 4,000 acres at Fort Peck Lake, eastern Montana as a technical study in support of the EIS for the Missouri River Master Water Control Manual. Recorded 49 archaeological sites and analyzed reservoir shoreline erosion effects on historic properties. Field Director and principal author for survey for compliance with Section 106 of the National Historic Preservation Act in conjunction with the Missouri River Master Water Control Manual Environmental Impact Statement.

Kelso-Beaver Pipeline FERC License Application; Portland General Electric Company. Project Archaeologist for FERC license application for a 17-mile-long natural gas pipeline in southwestern Washington and northwestern Oregon. Conducted a records search, literature search, and field surveys and consulted with four Native American groups and the State Historic Preservation Office for Section 106 National Historic Preservation Act compliance.

Sly Park Flashboards EA; El Dorado Irrigation District. Project Archaeologist for National Register criteria evaluations of two prehistoric sites located on the shorelines of a reservoir in east-central California for reservoir expansion project. Planned and directed archaeological excavations to evaluate the sites, and prepared site evaluation report. Consulted with the Bureau of Reclamation, State Historic Preservation Office, and Native American tribes.

Piñon Pine Power Project; Sierra Pacific Power Company. Project Archaeologist for historic properties survey and site evaluation program for a coal gasification project in west-central Nevada. Conducted field survey to identify sites, and directed test excavations to evaluate the National Register eligibility of a prehistoric archaeological site. Consulted with Native American tribe and State Historic Preservation Office for Section 106 National Historic Preservation Act compliance on behalf of the Department of Energy.

Sutter Energy Center, Calpine Corporation. Project Archaeologist for California Energy Commission Application for Certification for merchant thermal power plant and 30 miles of natural gas and electrical transmission facilities. Planned and conducted cultural resources inventories and prepared license application. Prepared Application for California Energy Commission and cultural resources inventory report to meet Section 106 National Historic

Douglas M. Davy, Ph.D., RPA
Consulting Archaeologist

Preservation Act requirements for Western Area Power Administration. Prepared Monitoring and Mitigation Plan and supervised construction monitoring of natural gas pipeline.

Columbia River System Operation Review EIS; Bonneville Power Administration. Prepared an EIS evaluating 21 alternatives for the reoperation of the 14 federal dams on the Columbia and Snake river systems. Analyzed potential effects of project operational alternatives on archaeological sites and Native American traditional cultural properties. Authored computer program to analyze reservoir fluctuation effects on archaeological sites and data analysis chapters of technical appendix to EIS. Participated in multi-party technical working group with 5 federal agencies and 14 Native American tribes to assess regulatory issues and potential effects of reoperation program.

Benicia Army Cemetery Historic Resources Management Plan; U.S. Army Corps of Engineers. Project Manager for Historic Resources Management Plan and public interpretation plan for Benicia Army Cemetery, the oldest U.S. military post cemetery in the Pacific States. Directed archival research program at National Archives. Prepared an interpretive program for the cemetery.

PUBLICATIONS AND PRESENTATIONS

Davy, D.M. 1999. Early Holocene buried sites in the Tustin Plain. Society for California Archaeology, Sacramento, California.

Davy, D.M., R. Herbert, and J. Carrier. 1998. A Regional and Interservice Approach to Historic Buildings and Structures Evaluation. *Proceedings of the National Defense Industrial Association.*

Davy, D.M. 1995. Simulating reservoir effects on archaeological sites for the Columbia River System Operation Review. Annual Meeting of the Northwest Anthropological Conference.

Davy, D.M. and B.A. Ramos. 1994. A statistical analysis of Gunther Barbed projectile points from two Northern California sites. *Proceedings of the Society for California Archaeology* 7.

Davy, D.M. 1994. River flow regulation as a measure to mitigate the effects of a hydroelectric project on a cultural landscape. Annual meeting of the National Council on Public History.

Davy, D.M. 1980. Borrowed concepts: a comment on Rhoades. *American Antiquity* 45:346-349.

ATTACHMENT 2

DON LETTER 11015, SER 5GPN.KC/364, DATED SEPTEMBER 17, 2002, AND STATEMENT OF WORK, CURATION, STORAGE, AND COLLECTIONS MANAGEMENT

Letter Agreement N68711-02-LT-00034

STATEMENT OF WORK
CURATION, STORAGE, AND COLLECTIONS MANAGEMENT FOR NAVAL WEAPONS STATIONS SEAL BEACH AND DETACHMENT FALLBROOK ARCHAEOLOGICAL COLLECTIONS

1 GENERAL REQUIREMENTS:

This Statement of Work (SOW) outlines general goals and specifications for professional curatorial services, security, labor, housing, storage, and materials to be supplied by the Contractor (San Diego Archaeological Center (SDAC)). The Contractor shall implement the Collections Management Procedures and keep Navy archaeological collections up to federal standards (36 CFR Part 79, Curation of Federally-Owned and Administered Archeological Collections, and 43 CFR Part 10.9, Native American Graves Protection and Repatriation Act (NAGPRA) inventory requirements). The Contractor shall also provide storage (housing and maintenance) for these collections that meets the federal standards for long-term curatorial services (36 CFR Part 79.9). These services shall be provided in accordance with the requirements specified herein. The Contractor shall meet the Secretary of the Interior's Historic Preservation Proposed Revised "Professional Qualification Standards" of November 1994 for cultural resource consultants in the field(s) of prehistoric archaeology, historic archaeology, or curation and be able to provide long-term curatorial services as described for a repository in 36 CFR Part 79.

The Government has continued ownership and control over the collections and any other Government-owned personal property listed in Attachments (A) and (B) provided to the SDAC. The Government has responsibility to ensure that the collections are suitably managed and preserved for public good.

2 DESCRIPTION OF WORK:

Budget: A budget will be submitted by SDAC to the Government for approval within 10 days of signing the letter agreement.

Curatorial Services: SDAC shall implement Collections Management Procedures, including NAGPRA review of the collections if necessary, and provide curatorial services in accordance with 36 CFR Part 79. SDAC shall be responsible for accessioning, labeling, cataloging, storing, maintaining, inventorying, and conserving the collections listed on Attachment (A). This includes evaluating these collections to determine if they meet 36 CFR Part 79 standards and bringing them into compliance if they are below these standards. SDAC shall also conduct a NAGPRA inventory for those collections that have not been inventoried for NAGPRA or may contain material remains subject to NAGPRA, in accordance with 43 CFR Part 10.9. SDAC shall implement any special procedures or

handling requirement as described in the final approved Collections Management Procedures report for collections.

Collections Available for Research, Education, Religious Interest: With written approval of the Technical Point of Contact (Technical POC), SDAC can make the collections available for scientific, education, and religious uses, in accordance with procedures established by the final approved Collections Management Procedures. Requests for consumptive uses of the collections shall be forwarded in writing to the Technical POC for review and approval. SDAC shall not approve these requests without written approval from the Technical POC. SDAC shall implement the Collections Management Procedures for evaluating requests for use.

Displays: SDAC shall create exhibits in consultation with the Technical POC and the appropriate NAVWPNSTA Seal Beach or Detachment Fallbrook staff on an as needed basis. Funding has been provided to cover costs. Displays will be transported, set up, and taken down by SDAC staff. The Technical POC will act as curator for NAVWPNSTA Seal Beach and Fallbrook Detachment.

Publications: Publications resulting from the study of these collections through research requests will be approved in writing by the Technical POC prior to publication (Attachment C). Copies of any publications shall be provided to the Technical POC and the SDAC for their permanent files.

Requests for Transfer or Repatriation: Any requests to transfer or repatriate any collections (material remains or associated records) shall be submitted in writing to the Technical POC within 24 hours after SDAC receives the request. SDAC shall not transfer, repatriate, or discard any collection without written permission from the Technical POC. SDAC is NOT authorized to sell or lease any part of collections.

Contractor Inspections and Inventories: To ensure security of the collections, in conjunction with standard museum practices, all collections shall require inspections to be completed by the Contractor as specified below. SDAC shall inspect and inventory the repository on a quarterly basis to ensure that they are complying with the terms and condition of this SOW. SDAC shall provide the following to the Government:

A) Make available a copy of the catalog list of contents of the collections received and accessioned by SDAC.
B) Verification of box inventories or other locational data
C) a list of Government-owned personal property received by SDAC.

The inspector, a qualified museum professional pursuant to 36 CFR 79.4(h), shall conduct all inspections and inventories. The inspector can be either an independent party or a member of SDAC staff. The inspector shall visit the physical plant of SDAC to monitor the physical security and environmental control measures at regular intervals, as specified in the Collections Management Procedures report. The inspector shall examine

all collections (material remains and associated records) to assess their condition and regularly monitor them for signs of deterioration and damage as specified in the Collections Management Procedures report; a systematic sampling strategy may be employed if agreed to by the Technical POC and the appropriate NAVWPNSTA Seal Beach or Fallbrook Detachment staff. The inspector shall inventory the collections by accession, lot, or catalog record to verify the location of the collections and any other Government-owned personal property in the SDAC's possession as specified in the Collections Management Procedures report. After each inspection and inventory, the inspector shall prepare and provide the Government with a written report documenting the results of the inspection and inventory, including the status of the collections, any treatments conducted, and recommendations for additional treatments. This report may be part of the quarterly progress report.

When there is a discovery of a loss, theft, deterioration, damage, or destruction of any or part of the collections or any other Government-owned personal property, within five calendar days SDAC shall prepare a written report notifying the Government of the incident and the conditions surrounding it. SDAC shall also make collections and any other Government-owned personal property available to inspection by the Government at regular intervals as established by the Collections Management Procedures report. SDAC shall also make the collections containing religious items available to official Native American representatives, religious leaders, and elders from Native American tribes for which the remains have religious or sacred importance. The Technical POC will make the determination of what is "religious" or "sacred" in consultation with tribal representatives as per 36 CFR Part 79.4(l).

Government Inspections: The Government will also conduct inspections to ensure compliance with this contract and 36 CFR Part 79. The Government will have qualified Federal agency professionals, pursuant to 36 CFR 79.4(h), inspect and investigate reports of lost, stolen, deteriorated, damaged or destroyed collections, or part of collections or any Government-owned personal property within 14 days after receipt of the discovery report. Federal agency professionals will inspect collections and Government-owned personal property, including SDAC facilities where they are housed, to determine that SDAC is in compliance with the standards established by 36 CFR Part 79.9 and to evaluate SDAC's performance for providing the services specified in this contract. The inspection may also involve Naval Criminal Investigative Services (NCIS) if a criminal act is involved and be subject to NCIS's investigation. Routine Government inspections will be conducted based on the types and condition of remains and records as follows:

a) Religious remains will be inventoried every 6 months.

b) Fragile and/or perishable material remains or records will be inventoried every 6 months with minimal handling and direct contact.

c) Stable material remains or records will be inventoried every 18 months.

d) Material remains and records of high monetary value will be inventoried every 6 months.

The Government may consult with persons who possess collections management and preservation expertise for similar collections (36 CFR Part 79.6 (c)) to advise the Technical POC on inspections and inventories.

Progress Reports: Quarterly progress reports shall be submitted by SDAC, detailing the status of work completed for this SOW and projected completion of tasks in the following month. Reports shall be sent both to the Technical POC and the Station POC.

Meetings: A "kickoff meeting" shall be held within 10 calendar days after the award of the contract. SDAC Director and Collections Manager shall meet the Technical POC on a quarterly basis to discuss work progress. Quarterly is defined as services performed four times during each 12-month period of the contract at intervals of 80 to 100 calendar days.

Submittals and Schedule Matrix: Deliverable reports shall follow the general format identified in the Archeological Resource Management Reports (ARMR) guidelines as appropriate. Electronically submitted reports are adequate and should be in an electronic mail text or in Microsoft Word 97 or higher with any attachments in Excel 97 or higher or Access 97 or higher. Confidential information, including cultural resource location maps, resource inventory records, Native American sacred site descriptions and location maps, and nomination forms, shall be included as confidential appendices and bound separately from the report.

SDAC shall provide a schedule of progress report due dates to both the SWDIV Technical POC and the SDAC finance office at San Diego State University Foundation.

All submittals shall be delivered to Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, California 92132-5190. ATTN: Kirsten Collins, Code 5GPN.KC.

All submittals will be reviewed and approved by the Technical POC. All comments on draft submittals shall be incorporated into the final report.

The schedule matrix and time frame for the completion of the required work is as specified below:

TASKS	**DATE**
SUBMIT PROGRESS REPORTS	Quarterly
SDAC INSPECTION/INVENTORY REPORT	Quarterly
ASSESS CONDITIONS OF COLLECTIONS IF REQUIRED	As needed

UPDATE COLLECTIONS TO MEET FEDERAL STANDARDS IF REQUIRED	As needed
NAGPRA REVIEW OF COLLECTIONS IF REQUIRED	As needed
CURATORIAL SERVICES	date of award to 30 Sept 2006
DISPLAYS	date of award to 30 Sept 2006

3 GOVERNMENT FURNISHED MATERIAL AND INFORMATION:

The SDAC shall furnish all facilities, materials, supplies and equipment necessary for the performance of all work for this contract. The Government will provide information of the known locations of its collections.

4 LIST OF ATTACHMENTS:

a) Attachment (A): List of collections
b) Attachment (B): List of Government-owned personal property
c) Attachment (C) Data and Publications

5 LOCATION OF WORK:

All of the work, with the exception of the effort involved in transporting the collections, shall be conducted at SDAC facilities in San Diego, California or subcontractors approved by the Technical POC. Travel shall be required to transport the collections from federal agencies and private companies where these collections are located.

6 TERM OF CONTRACT:

The term of this letter agreement will be 1,460 calendar days from the date of award.

7 ORDER OF THE WORK:

The SDAC shall perform work in such a manner as to cause minimum interference with normal operation of Government business at the location indicated and to ensure maximum use of facilities during the execution of this contract.

8 TECHNICAL POINT OF CONTACT:

Kirsten Collins, Archaeologist, Code 5GPN.KC, Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, CA 92132-5190 **PHONE:** (619) 532-4313, FAX (619) 532-2518, email collinsks@efdsw.navfac.navy.mil.

9 STATION CONTACT

Lisa Bosalet, Naval Weapons Station, Attn: Code N45S, Bldg 110, 800 Seal Beach Blvd., Seal Beach, CA 90740-5000, **PHONE**:562-626-7637, fax 562-626-7131, 7131 email bosalet.lisa@sbeach.navy.mil.

10 STATION REGULATIONS:

For work on Naval Facilities or NAVWPNSTA Seal Beach or Detachment Fallbrook, the SDAC, its representatives and employees, shall become familiar with and obey all station regulations, including fire, traffic and security requirements.

11 SECURITY REGULATIONS:

For work on Naval Facilities or NAVWPNSTA Seal Beach or Detachment Fallbrook, the SDAC, and its representatives that require access, must obtain an identification badge prior to visiting the project location. Identification badges must be carried at all times while on site location and must be returned upon termination of the contract. Information and badge application forms may be obtained from NAVWPNSTA Seal Beach or Detachment Fallbrook.

a) SDAC representatives will be issued appropriate identification badges when the SDAC submits, in writing, a list indicating that all individuals are bonafide representatives of SDAC (volunteers or employees). The list shall be submitted a minimum of five working days prior to issuance of badges and shall contain the following information:

Name of Individual	Place of Birth
Social Security Number	Citizenship
Date of Birth	

It shall be the responsibility of the SDAC to provide employees who comply with these requirements. Proof of citizenship may be required.

b) SDAC 's equipment shall be conspicuously marked for identification. All SDAC representatives must be off the base by the end of normal working hours unless special permission is obtained.

c) Registration and proof of insurance shall be required for the Contractor's vehicle. Drivers licenses will also be required to obtain a base pass and access to the base.

12 SAFETY REGULATIONS:

All work performed under this contract shall comply with health and safety regulations. Any SDAC violations shall be reported to the Technical Point of Contact.

13 WORK HOURS:

All work is to be performed during regular hours, Monday through Friday, excluding Government holidays unless prior permission is obtained.

14 INSURANCE:

A minimum of 15 days prior to receipt of collections, the Contractor shall furnish the Government a *Certificate of Insurance* as evidence of the existence of the following insurance coverage in amounts not less than specified below.

a) The Contractor shall procure and maintain, during the entire period of performance under this contract, the following minimum insurance coverage.

1. Comprehensive General Liability: $500,000 per occurrence.

2. Automobile Liability: $200,000 per person; $500,000 per occurrence; $20,000 per occurrence for property damage

3. Worker's Compensation: as required by Federal and State worker's compensation and occupational disease statutes.

4. Employer's Liability coverage: $100,000, except in states where worker's compensation may not be written by private carriers.

5. Other as required by State Law.

b) The Certificate of Insurance shall provide for thirty days written notice to the Government by the insurance company prior to cancellation or material change in policy coverage.

15 INVOICES:

The SDAC shall submit invoices for partial payments. The invoices will be approved for payment contingent upon written Government acceptance for completed tasks in accordance with the following schedule and specifications:

a) SDAC may invoice on a quarterly basis for a partial payment of up to 6.25% of the Project award per invoice for the duration of this contract starting from the date of award.

b) Invoices must be accompanied by a progress report or an inspection/inventory report.

c) Payments will be based on invoices submitted by the contractor for satisfactorily completed work.

d) Invoices not completed in accordance with contract requirements will be returned to the contractor for correction of the deficiencies.

1. Invoices: Invoices shall be submitted in original and two copies. The following information must be shown on the invoice to be accepted and processed for payment:

a. Contractor name and address on original company letterhead.
b. Letter Agreement Number.
c. Period of performance such as specific quarter and product provided. Note: date of invoice must be <u>after</u> receipt and acceptance of product by the Government.
d. Brief description of services performed.
e. Amount.
f. Payment terms (i.e., net 30 days)
g. Invoice number.
j. Accounting data.
h. Contract line item number, CLIN 0001 must be referenced with the accounting data.
i. Original signature.
k. All Invoices shall be forwarded to:

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CODE 5GPN.KC
1220 PACIFIC HIGHWAY
SAN DIEGO, CALIFORNIA 92132-5190

RESPONSE TO COMMENTS
DRAFT ARCHAEOLOGICAL DATA RECOVERY PLAN
FOR A PORTION OF PREHISTORIC ARCHAEOLOGICAL SITE
CA-ORA-322/1118 TO MITIGATE IMPACTS
OF SOIL REMOVAL REMEDIATION FOR
INSTALLATION RESTORATION PROGRAM SITE 73
DATED JUNE 24, 2002
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1493

Mr Bruce Fitzpatrick Vice-Chairperson, Archaeological Advisory Committee City of Seal Beach, City Hall 211 Eighth Street Seal Beach, CA 90740-6379 Comments: August 7, 2002	Responses by: Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705 Response: November 5, 2002
Specific Comments on the Draft Archaeological Data Recovery Plan for IRP Site 73	
Comment 1. The author or authors of the "Data Recovery Plan" should be indicated on the cover page, and a resume of the author or authors should be provided as an Appendix to the "Data Recovery Plan."	**Response 1.** Comment noted. The names of authors are on the cover page of the Data Recovery Plan. They are listed as Dr. James Carl Chatters, Ph.D., Principal Cultural Resources Scientist, and Douglas Davy, Ph.D., Consulting Archaeologist. Their resumes will be included in the final version of the document as requested.
Comment 2. Section 1.4.3, CA-Ora-322/1118, page C.1-8 - first sentence. This sentence should be clarified to indicate that CA-Ora-322 was recorded in 1971 by Colgrave and Desautels.	**Response 2.** Comment noted. The requested change has been incorporated into the final version of the document.
Comment 3. Section 2.1, Research Questions, page C.2-1 - first sentence. This sentence indicates previous research designs specific to portions of Landing Hill complex, as modified by Clevenger and Crawford, and then discusses the research questions to be. There has also been a research design prepared by KEA Environmental, Inc. (now EDAW) relating the archaeological sites within the Hellman Ranch Specific Plan area. A copy of this research design is provided for your information and use in considering the appropriate research questions and methodologies relative to the soil removal remediation work at JR Site 73.	**Response 3.** Comment noted. The research design referred to is a useful adjunct to the research design provided in the Work Plan. Data to be gathered with the Foster Wheeler Environmental Corporation (FWENC) technical approach to excavation and analysis will generate all information relevant to addressing the research issues addressed in the KEA document.

RESPONSE TO COMMENTS
DRAFT ARCHAEOLOGICAL DATA RECOVERY PLAN
FOR A PORTION OF PREHISTORIC ARCHAEOLOGICAL SITE
CA-ORA-322/1118 TO MITIGATE IMPACTS
OF SOIL REMOVAL REMEDIATION FOR
INSTALLATION RESTORATION PROGRAM SITE 73
DATED JUNE 24, 2002
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

DCN: FWSD-RAC-02-1493

Comment 4. Section 2.3.1, Faunal Analysis, page C.2-6 - first sentence. This sentence indicates faunal analysis will be completed by "using comparative specimens in his collection." It is unclear as to what collection is being used for reference purposes. Please clarify.	**Response 4.** Section 2.3.1, page C.2-6, first sentence along with the second through fourth sentences have been revised to read, "All bones, otoliths, and samples of shells recovered from this site will be identified to the least inclusive taxon possible. Identifications will be made by Dr. James Chatters, a Foster Wheeler Environmental Corporation (FWENC) archaeologist (See resume in Attachment 1), using comparative specimens in his collection, the collections of the Burke Memorial Washington State Museum (western birds) and California State University, Bakersfield (California mammals, fishes). The sample of shells from each excavation level or stratum in each 1 meter square unit selected for identification will be 2 liters or 20 percent of the total volume, whichever is greater. When a stratum contains less than 2 liters of shell, all shells in the assemblage will be identified."
Comment 5. Section 2.3.7, Obsidian Hydration and Obsidian Sourcing, page C.2-7 - first sentence. Please clarify the number and frequency of samples that will be required in accordance with the Work Plan.	**Response 5.** Section 2.3.7, page C.2-7, first sentence has been revised to read, "If obsidian is collected during excavations, up to 25 specimens will be submitted to a commercial obsidian hydration laboratory for hydration dating and sourcing."
Comment 6. Section 2.4, Reporting, page C.2-8 - second sentence. Please include the Archaeological Advisory Committee of the City of Seal Beach as a party to be provided a copy of the report for review and comment.	**Response 6.** Section 2.4, page C.2-8, second sentence has been revised to read, "The DON may elect to submit copies of the draft to the SHPO representatives of the Gabrielino community. The DON will submit copies of the draft to the Archaeological Advisory Committee of the City of Seal Beach for review and comment."

From: John Sharp [jshar@ohp.parks.ca.gov]
Sent: Wednesday, December 18, 2002 6:26 PM
To: 'Bosalet, Lisa E (NWS N45S)'
Cc: hans
Subject: Seal Beach NAWS Project

Hi, Lisa --
I'm sorry, but I'm unable to finish that letter, as I said I would, before I leave on vacation. Because it addresses a lot of steps and contains a history of correspondence, it is not something I can dash off, and it is competing with other submittals that need to go out before I leave. I tried to get that MOA turned around as quickly as I could, and, with Hans help, feel I was successful (I know you're in a hurry, but 6 days is very quick, and this included some waiting time necessary for us to talk on phone).

The letter will say that we agree with the APE, identification effort, eligibility, finding of adverse effect, and will reference DRP and MOA. Provided you can live with the relatively minor edits we suggested for the MOA, I see no red lights as far as getting a crew out there, etc., and I think we should be able to backdate a review letter slightly, if that would help. In the meantime, it would be good if you finalized the MOA (talk with Hans if necessary) and kept me updated on status/changes, so that I can write a complete review letter first thing when I get back on the 31st.
Have good holidays,
-John

-----Original Message-----
From: Bosalet, Lisa E (NWS N45S) [mailto:bosalet.lisa@sbeach.navy.mil]
Sent: Wednesday, December 18, 2002 12:04 PM
To: 'John Sharp'
Subject: RE: revised DRP, MOA for Seal Beach NAWS

In our discussion today we clarified the following issues:
Item (1)(a) The Navy shall change the text to read that an offer shall be made to the City of Seal Beach for a presentation of the data after the data recovery is complete.
Item (1)(b) The Navy shall create a display using data from the data recovery and previous sources of data and artifacts interpreting the data for public outreach. This display would be placed either in the Nature Center or the Pass and ID office at the Naval Weapons Station.
Item (1)(c) The Navy has no problem documenting the display to the SHPO within 2 years of the field work.
Item (2) Concerning curation. The Naval Weapons Station, Seal Beach has a Letter Agreement with the San Diego Archaeological Center for current artifacts to be curated and for additional items to be taken into the Center. I have attached a copy of the Letter Agreement and the execution document. This acts as the Centers agreement to take care of our collections.

The issue we discussed concerning requesting Native Americans to sign the MOA is a concern due to the fact that the groups in the Seal Beach area are not federally recognized. The Navy has demonstrated an open working relationship with the groups in our area as interested groups and intend to have Native American monitoring during data recovery and monitoring of this project.

Request we have Hans and I, or Jim Chatters, discuss further the proposed requirement from the SHPO to have Native American group(s) be requested to sign this MOA.

Lisa Ellen Bosalet
NEPA/Cultural Resources Manager
562-626-7637

-----Original Message-----
From: John Sharp [mailto:jshar@ohp.parks.ca.gov]
Sent: Friday, December 13, 2002 11:38 AM
To: 'Bosalet, Lisa E (NWS N45S)'
Subject: RE: revised DRP, MOA for Seal Beach NAWS

Hi, Lisa --
I appreciate your making those changes and forwarding them to me. A couple of remaining concerns and recommended changes in the DRP:

(1) public outreach (Section 2.5):

(a) I would request changing the text back to read that "The DON or its contractors WILL make an offer will be made to the Archaeological Advisory Committee of the City of Seal Beach", rather than "if requested..."

(b) Response 6 in your e-mail below is weakly worded (i.e., "could be..."). The Nature Center seems like an ideal place for public interp efforts (thanks for coming up with this idea). I would request that this idea be included in Section 2.5 with the wording that "DON or its contractors WILL create a display that will be exhibited....."

(c) I would request including a simple provision for documentation of these efforts, such as "The DON or its contractors will furnish SHPO with documentation of public outreach efforts within 2 years of the completion of mitigation fieldwork."

(2) curation (Section 2.6):

I think there's a mistake in your note below, so I'm not sure how you might want it to read, but this section should clearly indicate where previous collections are stored and indicate that future collections will go there, and include a letter of confirmation that the facility will accept the collection.

I'm still looking at the MOA, but will be leaving the office at noon today, returning on Tuesday a.m. and will get back to the MOA and any further comments you may have at that time.
Thanks again for your attention to my comments, and have a great weekend,
-John

-----Original Message-----
From: Bosalet, Lisa E (NWS N45S) [mailto:bosalet.lisa@sbeach.navy.mil]
Sent: Thursday, December 12, 2002 8:51 AM
To: John Sharpe (E-mail)
Subject: NAVAL WEAPONS STATION SEAL BEACH (USN991124A) LTR OF 22 JUL 2002

Hello John,

After working on a draft MOA for the soil removal project under the old water tower and modifying the text of our data recovery plan I am providing you this e-mail as information for your consideration when responding to our subject letter. The Navy agrees to make the changes stated in the response column and have provided the data recovery plan with changes highlighted. I didn't include the figures or the attachments because this was just too much information, but the final data recovery plan shall be apart of the MOA, which I have also attached for your review and comment in your letter back to us. We are looking to try to get out into the field soon, so if you could please let me know as soon as possible if there is anything I can do to continue this project through the 106 process, I can respond quickly. Thank you for your time.

John Sharpe Comments (Sections refer to file DataRecovery.doc)	**Navy Responses**
Comment 1. The Navy had recommended excavating a 1 percent sample of the archaeological deposit that will be removed during IRP Site 73 remediation. The SHPO would like to discuss 5%.	**Response 1.** Sections 2.2 and 2.2.1 have been revised to reflect a 5 percent data recovery sample, the amount to be determined from estimated midden volume.
Comment 2. The Work Plan needs to specify that the excavation method will be done horizontal to the contour rather than with the contour.	**Response 2.** Section 2.2.1, third paragraph, sixth and seventh sentences are revised to read, "Excavation will be in 10-centimeter levels within the site's natural strata, measured from the natural contour of the ground surface. Small, discrete lenses of midden will be

	excavated as natural units."
Comment 3. The SHPO recommends that after data recovery the Navy should take advantage of the potential to "mine" or grade for features.	**Response 3.** Section 2.2.1, a new eighth bullet has been added which reads, "**Exploration for Features**. Following completion of the 5 percent sample, one-half of the area of the APE that contains midden will be systematically scraped by front loader in approximate 20-centimeter lifts to recover any features that might have been missed during auger testing and controlled excavation. These features will be plotted into the site grid and excavated in the same manner as features found during controlled excavations."
	Response 4. Section 2.4, first sentence has been revised to read, "The report of findings will follow California Parks and Recreation Commission Archeological Resource Management Report guidelines…."

Comment 4. Recovery plan should mention ARMR.	
Comment 5. Curation should be stated with attachment showing agreement letter for handling artifacts and statement that this is where all the other artifacts from this archaeological site are curated.	**Comment 5.** Curation should be stated with attachment showing agreement letter for handling artifacts and statement that this is where all the other artifacts from this archaeological site are curated.
Comment 6. Data from data recovery should be used to inform the public about cultural resources. Items like displays, brochures, and the like have been done.	**Comment 6.** The Navy sponsors a Nature Center which supports public information about the Seal Beach National Wildlife Refuge, and a display could be created to better interpret information about past cultures in the Seal Beach or Orange County area.

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