

# **REVISION 2: DRAFT REMEDIAL DESIGN AND REMEDIAL ACTION WORK PLAN**

## **REMEDIAL ACTION AT IR SITE 25 FORMER NAVAL AIR STATION MOFFETT FIELD, CALIFORNIA**

Document Control No. ITSI-0808-0003-0003.R2

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Prepared under:

**Naval Facilities Engineering Command Southwest**  
Contract No. N62473-10-D-0808  
Contract Task Order 0003

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**September 2011**

**ITSI Project No. 07204.0100**



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## ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
ACM	asbestos-containing material(s)
AOI	Area of Investigation
APP	Accident Prevention Plan
ARARs	applicable or relevant and appropriate requirements
ARC	Ames Research Center
BA	biological assessment
BCT	Base Closure Team
BERA	baseline ecological risk assessment
bgs	below ground surface
BMP	best management practice
BRAC	Base Realignment and Closure
CAD	computer-aided design
Caltrans	California Department of Transportation
CBR	California black rail
CDFG	California Department of Fish and Game
CCR	California clapper rail, California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIH	Certified Industrial Hygienist
COEC	chemical of ecological concern
CSO	Caretaker Site Office
CSP	Certified Safety Professional, civil site plan
CTO	Contract Task Order
CY	cubic yards
DQO	data quality objective
DTSC	Department of Toxic Substances Control (California)
EDM	Eastern Diked Marsh
EMAC	Environmental Multiple Award Contract
EPP	Environmental Protection Plan
ESA	Endangered Species Act
EZ	Exclusion Zone
°F	degrees Fahrenheit
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	feet
GIS	geographic information system
gpm	gallons per minute
GSR	Green and Sustainable Remediation
HDPE	high-density polyethylene

HHRA	human health risk assessment
HSM	Health and Safety Manager
IR	Installation Restoration
ISSI	Integrated Science Solutions, Inc.
ITSI	Innovative Technical Solutions, Inc.
LF	linear feet
LGP	low-ground-pressure
MBTA	Migratory Bird Treaty Act
MDL	method detection limit
MROSD	Midpeninsula Regional Open Space District
msl	mean sea level
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NAVFAC SW	Naval Facilities Engineering Command Southwest
Navy	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NE	northeast
NIRIS	Naval Installation Restoration Information Solution
NPDES	National Pollutant Discharge Elimination System
NTP	notice to proceed
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OSPR	Office of Spill Prevention and Response
OU	Operable Unit
PCB	polychlorinated biphenyl
P.E.	Professional Engineer
P.G.	Professional Geologist
PG&E	Pacific Gas and Electric Company
PMO-West	Program Management Office West
QA	quality assurance
QC	quality control
QCM	Quality Control Manager
QCP	Quality Control Plan
QCSR	Quality Control Summary Report
RA	remedial action
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD/RAWP	Remedial Design/Remedial Action Work Plan
Refuge	Don Edwards San Francisco Bay National Wildlife Refuge
RG	remediation goal
RI	Remedial Investigation
RL	reporting limit

ROD	Record of Decision
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SHSP	Site Health and Safety Plan
SHSS	Site Health and Safety Specialist
SMHM	salt marsh harvest mouse
SWRP	Storm Water Retention Pond
SWPPP	Storm Water Pollution Prevention Plan
SWSB	Storm Water Settling Basin
T&D	transport and disposal
TCLP	Toxicity Characteristic Leaching Procedure
TOC	total organic carbon
TRV	toxicity reference value
USA North	Underground Service Alert of Northern California and Nevada
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
WATS	West-Side Aquifers Treatment System
WET	Waste Extraction Test
WPT	Western pond turtle

## **1.0 INTRODUCTION**

Innovative Technical Solutions, Inc. (ITSI), prepared this remedial design/remedial action work plan (RD/RAWP) on behalf of the Naval Facilities Engineering Command Program Management Office West (PMO-West) of the Base Realignment and Closure (BRAC) program being conducted by the United States Department of the Navy (Navy). The RD/RAWP describes activities to be performed during implementation of the remedial action (RA) at Installation Restoration (IR) Site 25 at the former Naval Air Station (NAS) Moffett Field, California (Figures 1, 2, and 3). ITSI is contracted through the Naval Facilities Engineering Command Southwest (NAVFAC SW) Environmental Multiple Award Contract (EMAC), Contract Number N62473-10-D-0808, Contract Task Order (CTO) 0003.

### **1.1 PROJECT OBJECTIVES**

The remedial design (RD) and RA at IR Site 25 are part of the Navy's response actions conducted at the site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The CERCLA Information System Identification number is CA2170090078. As part of the CERCLA response at IR Site 25, the Navy has prepared a record of decision (ROD; Navy, 2010). The ROD was signed by the regulatory oversight agencies, including the United States Environmental Protection Agency (USEPA) and the California Regional Quality Control Board–San Francisco Bay Region (Water Board), representing the State of California. The ROD stipulated that no CERCLA action was necessary at IR Site 25 to protect human health. For protection of the environment at IR Site 25, the ROD identified a remedial action objective (RAO) of reducing (exposure to) concentrations of chemicals of ecological concern (COECs) in sediment to levels that are protective of ecological receptors. The COECs for IR Site 25 are lead, zinc, total DDT, and total polychlorinated biphenyls (PCBs). Table 1 presents the remediation goals (RGs) related to the RAO, including the site-wide average RGs and the do-not-exceed RGs.

To implement the RA, shallow sediment will be excavated from pre-determined polygon-shaped areas throughout the site (Figure 4) that were selected due to the presence of COECs identified

during previous sampling activities. As stipulated in the ROD, the site-wide average RG for each COEC will be achieved after excavation of these areas. It is estimated that a total of approximately 5,000 cubic yards (CY) of sediment will be excavated from 54 polygons at the Eastern Diked Marsh (EDM), and approximately 28,000 CY will be excavated from 60 polygons at the Storm Water Retention Pond (SWRP).

After completion of the RA at IR Site 25, the site will be available for unlimited use and unrestricted exposure. Possible future uses of the IR Site 25 area under consideration include tidal marsh and managed pond. Attaining the site-wide average RGs will provide a level of protection adequate for tidal marsh reuse.

## **1.2 PROJECT ORGANIZATION**

Table 2 lists key personnel for the project, including select Navy staff, with their associated roles, responsibilities, and contact information. Figure 5 is the project organization chart identifying key personnel and depicting lines of reporting and communication for these personnel. Select ITSI project personnel are discussed below. The Accident Prevention Plan (APP; ITSI, 2011a) and the Site Health and Safety Plan (SHSP; ITSI, 2011b) provide further descriptions of key ITSI health and safety personnel and present emergency contact information.

The ITSI Project Manager, Mr. Robert Lindfors, P.E., will be the Navy's point of contact at ITSI. He will be responsible for overall project execution, and for cost and progress reporting. Mr. Lindfors also will be responsible for the technical quality of work performed and will ensure that regulatory requirements are met. He will participate in meetings with the Navy and the regulatory agencies.

Mr. Lindfors will report to Mr. Arvind Acharya, P.G., ITSI's EMAC Program Manager, who will assist in coordinating resources within the company to execute work in a timely and effective manner. Assisting Mr. Lindfors with technical issues will be Mr. Jeffrey Hess, P.G., ITSI Senior Technical Manager for the EMAC. Mr. Lindfors also will have support from Ms. Kellie Dougherty, ITSI Cost and Schedule Specialist. Ms. Dougherty will provide monthly schedule updates and cost reports to the Project Manager for review.

Mr. Scott Lovesy will serve as the ITSI Site Superintendent during major field operations, including excavation and transport and disposal (T&D). He will report directly to the ITSI Project Manager, and will be responsible for managing ITSI labor and subcontractors, overall field performance, and field communication including coordination with the Navy Resident Officer in Charge of Construction (ROICC) at Moffett Field. Mr. Lovesy will be on site during all field activities, with full authority and control over all aspects of field performance. He will execute all activities in compliance with Navy and regulatory requirements. ITSI field staff, subcontractors, material suppliers, T&D truck drivers, and miscellaneous vendors and specialty subcontractors will report to Mr. Lovesy.

Mr. Robert Guerrero will serve as Site Health and Safety Specialist (SHSS). He will implement the APP and SHSP (ITSI, 2011a, 2011b) in the field and will work closely with the Project Manager and subcontractor health and safety personnel to ensure a safe work environment for all site personnel. He will fill out all health and safety field documentation, and report any health and safety concerns to Ms. Carole Fried, CIH, CSP, the ITSI Director of Health and Safety and Health and Safety Manager (HSM).

Mr. Raymond Spencer will serve as Quality Control Manager (QCM) for ITSI. He will be responsible for quality control (QC) aspects of the project on site, and will implement the Quality Control Plan (QCP; Appendix A). He will work closely with the Project Manager and Project Chemist to ensure the quality of work, maintain data quality, and ensure that field activities are performed in accordance with contract requirements. He will be present at the site during field activities to oversee sampling, testing, and inspections and to maintain a high level of QC.

Mr. Richard Flynn is the ITSI Project Chemist. He developed the Sampling and Analysis Plan (SAP; Appendix B), and will assist the Project Manager during project execution by coordinating chemistry and data quality issues with the Navy Quality Assurance (QA) Officer. He will coordinate with analytical laboratories and data validation subcontractors and assure that electronic data deliverables are submitted in accordance with Navy standards. Mr. Flynn will

also verify that sample logs are maintained, review analytical reports, and develop Quality Control Summary Reports (QCSRs) at various stages of the project.

### **1.3 REGULATORY FRAMEWORK**

The Navy's response actions at IR Site 25 are administered under Section 117(a) of CERCLA and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). A Federal Facility Agreement (FFA) is in place for Moffett Field and has been signed by the Navy and the regulatory agencies (USEPA and Water Board).

IR Site 25 is a part of Operable Unit (OU) 6 at Moffett Field; other components of OU-6 are being addressed separately. For IR Site 25, a Remedial Investigation (RI) and Feasibility Study (FS) have been completed. After releasing a Proposed Plan in January 2009 and sponsoring a subsequent public participation period, the Navy issued a final ROD in November 2009. The ROD incorporated public comments and was signed by the Navy and the regulatory agencies in January 2010. A recent pre-design study was completed for IR Site 25 (KCH, 2011). The RI/FS reports, ROD, and other related documents are contained in the administrative record file maintained by the Navy for Moffett Field.

### **1.4 SCHEDULE**

Appendix C presents the planned project schedule (task durations are in working days). The Navy issued the DD1155 award to ITSI on 15 September 2010, and a project kickoff meeting was held on 05 October 2010. Biological studies were conducted from November 2010 through July 2011. Due to excessive surface water present at the site during summer 2011, major RA activities were postponed until spring 2012 (with concurrence from the regulatory agencies), to allow for planning for water diversion that will be necessary to allow the excavation of sediment to take place. The Navy notified the regulatory agencies of this postponement in May 2011.

As indicated on the schedule, major RA field activities including water diversion are planned to begin in May 2012. Sediment removal (excavation) activities and T&D activities are scheduled to begin in July 2012 and to be completed in October 2012. The precise sequence of excavation will depend on the presence or absence of surface water and wildlife in the areas to be excavated,

and will be decided upon during the pre-construction phase before major site activities are initiated. Final site restoration activities are scheduled to be completed in mid-November 2012. Acceptance from the Navy of completion of field work is planned for late November 2012. A Remedial Action Completion Report (RACR) will be prepared at the close of field activities, and final acceptance of the RACR by regulatory agencies is anticipated around mid-2013.

## 2.0 SITE DESCRIPTION AND BACKGROUND

Moffett Field is located about 35 miles south of San Francisco and 10 miles north of San Jose, California (Figure 1). The Navy operated the facility as NAS Sunnyvale from 1933 to 1935. The United States Army Air Corps took over operations at the facility from 1935 to 1942, when the Navy resumed operations and renamed the facility NAS Moffett Field. The Navy closed the facility as an active military base in 1994 and transferred the property to the National Aeronautics and Space Administration (NASA) on 01 July 1994. The NASA Ames Research Center (ARC) now operates the facility; the Navy continues to be responsible for environmental restoration at the facility.

IR Site 25 is a broad, flat expanse of undeveloped land approximately 230 acres in size, located in the northwestern portion of Moffett Field between the Moffett Federal Airfield flight line and San Francisco Bay (Figures 2 and 3). The area is mostly below sea level, and was a wetland marsh until diking and drainage activities were conducted in the late 19<sup>th</sup> century. Today the site is bounded on the north and northeast by former solar salt ponds that now are part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) administered by the United States Fish and Wildlife Service (USFWS). The site is bounded on the east by IR Site 1, a former Moffett Field landfill; on the southeast by the Moffett Federal Airfield flight line; on the south by undeveloped portions of NASA ARC; and on the west by Stevens Creek and the Stevens Creek Trail. The San Francisco Bay Trail, a public access trail for hikers and bicyclists administered in part by USFWS, rings the northern portion of IR Site 25. San Francisco Bay proper is approximately 1 mile to the north of IR Site 25.

IR Site 25 has two distinct components: the EDM (approximately 20 acres in size) on the southern end, and the SWRP (approximately 210 acres in size) to the north. The SWRP is further demarcated into a western portion (owned by Midpeninsula Regional Open Space District [MROSD]) and the central and northeastern basins, both managed by NASA ARC (Figure 4).

The EDM and SWRP have been part of the storm water management system for the western

portion of Moffett Field since 1953. From that time until about 1992, storm water from a large portion of the west side of Moffett Field, including the Hangar 1 area, flowed to the Lindbergh Avenue ditch, which directed the flow to the northeastern corner of EDM. In 1991, NASA redesigned the storm water collection system for the western portion of Moffett Field so that runoff is directed into an underground pipe network. This network directs the water to the Storm Water Settling Basin (SWSB; also referred to as facility NA289), a concrete basin located at the southern edge of EDM. The SWSB also receives treated groundwater from the West-Side Aquifers Treatment System (WATS), a groundwater remediation system operated by the Navy (approximate system flow rate is 50 gallons per minute [gpm]).

The SWSB outfall discharges effluent into EDM. The SWSB also has an overflow spillway that allows influent water to bypass the settling basin and flow directly into EDM during heavy rain events. Sediment that settles at the SWSB is characterized and removed by NASA annually, typically during August-September.

From EDM, water drains by gravity through three 48-inch culverts under North Perimeter Road to the central basin of the SWRP. The central basin in turn connects to the western and northeastern portions of the SWRP through breaches in levees. Portions of SWRP are flooded with 1 to 5 feet (ft) of standing water during wet months, but historically are dry during summer and fall.

There are several “upland areas” in the central basin that are controlled by NASA. One upland area, Area of Investigation (AOI) 14, is approximately 8 acres in size. Soil at AOI 14 has been characterized as being impacted with PCBs. Response actions at AOI 14 are being administered by NASA and are not a direct part of the IR Site 25 RA.

Previous investigations have indicated that within IR Site 25, sediment with the highest COEC concentrations is found near the former discharge point of the Lindbergh Avenue ditch in the EDM, and that COEC concentrations generally decrease with distance from that point. This pattern was confirmed by results of the recent pre-design investigation of sediment that was

completed in 2010 and discussed in detail in the *Final Data Summary Report for Pre-Design Investigation of Sediment at IR Site 25* (KCH, 2011).

In August-September 2005, NASA excavated 450 CY of shallow soil from EDM in areas immediately to the north of the SWSB; and in September 2006, NASA excavated another 500 CY of shallow soil from adjacent areas farther north and west of the previously excavated areas. Analyses of this material indicated the presence of PCBs, lead, and zinc, but not DDT (Integrated Science Solutions, Inc., [ISSI], 2007).

## **2.1 LAND USE**

The objective of the project is to conduct an RA so that IR Site 25 is available for unlimited use and unrestricted exposure. Potential future uses include use as a tidal marsh to support a wide variety of habitat and use as a managed pond that provides storm water retention and open water habitat.

## **2.2 CLIMATE**

Moffett Field is located along the southwestern end of San Francisco Bay, adjacent to the cities of Mountain View and Sunnyvale, California. Compared to other portions of the San Francisco Bay Area, the Moffett Field environs are relatively sheltered from westerly winds and storms from the Pacific Ocean by coastal range mountains.

The area near Moffett Field has a Mediterranean climate, with warm, dry summers and mild, wet winters. Monthly average maximum temperatures for Palo Alto, 4 miles north of Moffett Field, range from 57.4 degrees Fahrenheit (°F) in January to 78.5°F in August. Monthly average minimum temperatures range from 38.3°F in December to 54.8°F in July.

Palo Alto receives an average of 15.41 inches of precipitation per year. Average monthly precipitation ranges from 0.02 inches in July to 3.22 inches in January. Monthly averages for the six driest months are as follows: May, 0.39 inches; June, 0.09 inches; July, 0.02 inches; August, 0.05 inches; September, 0.18 inches; and October, 0.70 inches. Monthly averages for the six wettest months are as follows: November, 1.81 inches; December, 2.77 inches;

January, 3.22 inches; February, 2.88 inches; March, 2.31 inches; and April, 1.00 inches (Western Regional Climate Center, 2010).

### **3.0 REMEDIAL DESIGN**

As previously described, the selected remedy for IR Site 25 includes excavation of sediment impacted by COECs including DDT, PCBs, lead, and zinc. This section presents the RD for the IR Site 25 remedy. USEPA references used as guidance in developing the RD include the *Remedial Design/Remedial Action Handbook* (USEPA, 1995) and *Operation and Maintenance in the Superfund Program* (USEPA, 2001).

Topics discussed in this RD section are: basis of design, including brief descriptions of previous subsurface investigations at the site; conformance with applicable or relevant and appropriate requirements (ARARs); RD drawings prepared for the project; and operation and maintenance (O&M) requirements.

Because the remedy does not entail traditional construction activities, the RD did not include development of traditional technical specifications. However, special considerations regarding sediment chemistry, minimizing impacts to existing biological resources, and wetland restoration are crucial elements of the RD and are addressed in this section and throughout this RD/RAWP.

#### **3.1 BASIS OF DESIGN**

The remedy will excavate sediment in areas with COEC concentrations higher than do-not-exceed RGs (Table 1). Attainment of the do-not-exceed RGs at each selected area will result in meeting the site-wide average RGs (Table 1), which are risk-based and are considered protective of ecological receptors for conditions at IR Site 25. The selection of areas to be excavated was based on previous investigations, including the recent pre-design sampling event (KCH, 2011), as described below.

##### **3.1.1 Previous Investigations at IR Site 25**

The Navy has conducted RI and FS studies at Moffett Field since 1993; several of these studies addressed IR Site 25. The IR Site 25 ROD includes a comprehensive list of references to previous reports and the sources of data that were considered during selection of the remedy (Navy, 2010). Information from those sources and the ROD that is pertinent to the RD is repeated here.

### *3.1.1.1 Contaminant Fate and Transport*

Due to their locations relative to the Moffett Field storm drain system, the EDM and SWRP that comprise IR Site 25 receive loads of sediment suspended in storm water conveyed from a wide portion of the west side of the Moffett Field facility. Sources of sediment contamination include: the runway landfill (IR Site 1); the engine test stand area (IR Site 11); a sump and oil and water separator (IR Site 15); Hangar 1 (IR Site 29); the storm water conduits themselves; historical use of pesticides at Moffett Field; and various upland source areas (SulTech, 2005).

At IR Site 25, the identified COECs (DDT, PCBs, lead, and zinc) are considered generally immobile because in marsh conditions like those at the site, these chemicals tend to associate with the solid phase instead of dissolving in water. Lead and zinc are known to form organic complexes that adsorb to oxides and clay minerals found in typical sediment. DDT and PCBs are considered insoluble and tend to adsorb to fine-grained (clay) sediment and organic matter. Therefore, possible transport mechanisms for the COECs at IR Site 25 are resuspension and subsequent transport of sediment. However, due to the physical location and flat terrain of the site, there is little likelihood for sediment resuspension. The primary fate mechanism of DDT and PCBs in sediment at IR Site 25 is likely microbial degradation (SulTech, 2005).

### *3.1.1.2 Development of Remediation Goals*

The results of the RI sampling and testing events at IR Site 25 were evaluated in a baseline human health risk assessment (HHRA) and in a baseline ecological risk assessment (BERA) originally developed for OU-6 at Moffett Field, and refined for IR Site 25 (Navy, 2009). The HHRA concluded that no RA was needed at IR Site 25 based on either cancer or noncancer adverse effects to humans. The BERA concluded that RA was needed at IR Site 25 to address risk of exposure to DDT, PCBs, lead, and zinc by ecological receptors (Navy, 2010).

RGs were developed based on site-specific conditions for a managed pond scenario, a storm water retention pond scenario, and a tidal marsh scenario. The Navy selected to implement RGs for the tidal marsh scenario, considered the most protective scenario of the three. The site-wide average RG for each COEC promulgated in the ROD was either the ambient concentration

(based on regional datasets) or the risk-based concentration, based on the low toxicity reference value (TRV) calculated during the BERA (Navy, 2010).

### *3.1.1.3 Application of RGs and Selection of Areas to be Excavated*

During the RI phase for IR Site 25, the Navy established a sediment sample grid at the EDM and SWRP appropriate for the site conditions and conceptual site model (Sultech, 2007). This grid formed the basis for delineating the site into Thiessen polygons, an area-weighted method that creates polygons with sides that are equidistant from adjacent sample locations in the grid; i.e., each polygon contains all the area that is closer to a given sample point than to any other sample point. This sampling approach was approved by the regulatory agencies.

The ROD examined historical results of chemistry tests to calculate the do-not-exceed RGs and to select the polygons that would need to be excavated so that the site-wide average RGs would be attained. The recent pre-design report presented the historical results with recent sampling/testing results, and further refined the polygons to be excavated during the RA (KCH, 2011). Those updated areas are identified in the RD drawing set (Section 3.3 and Appendix D).

### **3.1.2 Chemistry Data Requirements for the RA**

For the RI and pre-design efforts at IR Site 25, sample results for each polygon were considered representative of the sediment in the entire polygon. This approach will also be used during the RA confirmation sampling program to be conducted to verify attainment of do-not-exceed RGs at each polygon (see SAP, Appendix B). The do-not-exceed RGs were used in selecting the reporting limits (RLs) for chemical tests to be conducted during the confirmation sampling program and during the characterization of fill material (see SAP, Appendix B).

### **3.1.3 Geotechnical Data**

Geotechnical analysis of sediment samples collected from the top 3 ft of sediment at 18 SWRP locations was conducted during the fall-winter of 2010 (KCH, 2011). Test results were reported for the following parameters: specific gravity; unit weight; Atterberg limits (plasticity); grain size; moisture content; visual classification; and triaxial unconsolidated, undrained shear strength. Field measurements including penetrometer and vane shear tests were also performed

to further evaluate physical characteristics of the sediment (KCH, 2011). These data will be used during the RA when considering possible locations for temporary access roads. The unit weight relationship will be used in estimating how much sediment can be loaded into a truck bed while maintaining legal haul limits.

### **3.1.4 Treatability Analysis and Leachability Tests**

A treatability analysis and a series of leachability tests of IR Site 25 sediment samples with elevated concentrations of lead was conducted during fall-winter 2010 (KCH, 2011). The objective of the treatability analysis was to compare reagent technologies for stabilizing lead and zinc present in the sediment matrix, to assess whether stabilization would be effective and would possibly reduce waste disposal costs. While some reagent tests appeared effective in stabilizing lead and zinc, the leachability tests indicated that neither lead nor zinc demonstrated a tendency to leach from the sediment matrix, i.e., the sediment may be characterized as non-hazardous without stabilization. Additional leachability tests for the COECs at the site will be conducted during waste profiling (Section 4.3).

## **3.2 CONFORMANCE WITH ARARS**

The ROD for IR Site 25 lists the ARARs that affect the RD/RA for the site (Navy, 2010). Chemical-specific ARARs in the ROD address waste characterization and disposal. All sediment to be excavated and removed from the site will comply with applicable regulations and rules regarding characterization, and all disposal facilities used during this project will be licensed waste facilities with the appropriate permits and licenses in place.

Other chemical-specific ARARs in the ROD address water quality. All actions taken during the RA, including water diversion (Section 4.2), will conform to requirements stipulated in the Basin Plan promulgated by the Water Board (Water Board, 2010).

Location-specific ARARs in the IR Site 25 ROD address biological issues and include the Endangered Species Act (ESA); the Migratory Bird Treaty Act (MBTA) of 1972; and the Coastal Zone Management Act. As described in subsequent sections of this RD/RAWP, RA activities will be conducted in conformance with these biological ARARs.

Other location-specific ARARs in the ROD address navigable waters and protection of wetlands. As described herein, the RA activities will not result in releases of excavated sediment and will not affect the course, location, condition, or capacity of adjacent navigable waters. Wetlands will be restored and monitored as necessary to provide for habitat restoration (Section 6.5).

### 3.3 LIST OF DRAWINGS

The set of RD technical drawings is presented in Appendix D. These drawings form the basis of the RA activities to be implemented in the field. Information in the drawings includes the locations and planned depths of excavations, and the resulting volume of sediment to be removed at each polygon. The Civil Site Plans (CSPs) indicate in detail the polygons to be excavated, as identified in the pre-design study (KCH, 2011). The CSPs were generated using the computer-aided design (CAD) system and the geographic information system (GIS) used by the Navy and NASA ARC. The northing and easting coordinates of the corners of each polygon to be excavated will be forwarded to the excavation team for delineation of the target areas in the field. The drawings included in Appendix D are as follows.

<u><i>Drawing number</i></u>	<u><i>Drawing title</i></u>
<b><u>General</u></b>	
G-1	Maps and List of Drawings
G-2	Abbreviations, Legend, and Notes
<b><u>Civil</u></b>	
C-1	IR Site 25 Site Plan
C-2	Traffic Control and Bay Trail Closure Plan – Local Haul
C-3	Traffic Control and Bay Trail Closure Plan – Offhaul
C-4	Schedule of Excavations
C-5	Diversion of WATS Effluent
C-6	SWRP Water Diversion Plan
C-7	CSP Key Plan
CSP-1	Civil Site Plan (1)
CSP-2	Civil Site Plan (2)
CSP-3	Civil Site Plan (3)
CSP-4	Civil Site Plan (4)
CSP-5	Civil Site Plan (5)

**Drawing list (continued)**

<b><u>Drawing number</u></b>	<b><u>Drawing title</u></b>
CSP-6	Civil Site Plan (6)
CSP-7	Civil Site Plan (7)
CSP-8	Civil Site Plan (8)
CSP-9	Civil Site Plan (9)
CSP-10	Civil Site Plan (10)
CSP-11	EDM Plan (1)
CSP-12	EDM Plan (2)

**3.4 OPERATION AND MAINTENANCE REQUIREMENTS**

O&M requirements for IR Site 25 will include ecological monitoring. Replanted and newly planted vegetation will be inspected periodically to track the condition of the planted areas and to assure that the vegetation takes root and flourishes. Appendix H is the restoration plan for IR Site 25 and describes the Navy's future activities for re-vegetating and monitoring the condition and health of the wetland areas.

## **4.0 PRE-CONSTRUCTION ACTIVITIES**

This section describes activities to be conducted for the RA before formal construction (excavation and T&D) activities begin.

### **4.1 PRE-CONSTRUCTION BIOLOGICAL SURVEYS**

To protect biological resources at IR Site 25, extensive participation from experienced biologists will be required. The Navy will coordinate with USFWS and with the California Department of Fish and Game, Office of Spill Prevention and Response (CDFG-OSPR) during the RA to ensure that activities will not likely impact federal endangered and listed species or state special status species at IR Site 25. Major undertakings regarding biological issues being conducted prior to the invasive RA field activities include the following:

- Pre-design biological site reconnaissance was conducted over the wet and dry months of 2010. Special status species encountered or observed during the reconnaissance included two State Fully Protected Species and four State Species of Special Concern (see KCH, 2011, Appendix A).
- A biological assessment (BA) report, based on site surveys conducted in fall 2010, has been prepared and is presented in Appendix E. The BA is intended to comply with substantive requirements of the ESA.
- A database search of possible species of interest (both flora and fauna) for the project was conducted. Appendix F includes tables presenting lists of species of interest.
- Surveys for the California black rail (CBR) and California clapper rail (CCR); rare plant surveys; and surveys for aquatic snails were conducted during spring-summer 2011 ahead of the planned invasive RA activities. Survey reports are included in Appendix G.
- Each area to be excavated or disturbed (by temporary access roads, sediment laydown areas, etc.) will be inspected by a botanist familiar with local saltwater and freshwater marsh vegetation to record the type and density of plants present. Photographs will be used to support and document the inspections.

### **4.2 WATER DIVERSION**

Drying out the project site will be crucial to allow excavation and T&D activities to occur efficiently and with minimal impacts to the environment and to activities at NASA ARC. Two major efforts for diverting water will be undertaken, as described below.

#### **4.2.1 Diversion of WATS Water**

WATS effluent (approximately 50 gpm) will be diverted away from the SWSB prior to formal construction activities. As discussed with and cleared by NASA ARC and approved by the Water Board by e-mail on 15 March 2011, this activity will be covered under the existing National Pollutant Discharge Elimination System (NPDES) permit for WATS discharge (Water Board, 2009). The WATS effluent water is routinely sampled for volatile organic compounds (VOCs) and other constituents and is typically devoid of contamination.

The diversion will entail installing a lift pump into an existing manhole at the connection to SWSB. The pump will be powered by a diesel generator. The pump discharge will be connected to temporary pipes or fire hoses and directed to an existing catch basin east of Zook Road and west of the Moffett Federal Airfield flight line (Figure 7). The catch basin will convey the water by gravity eastward under the flight line to join the NASA ARC storm drainage system, eventually ending up in the Northern Channel. From the Northern Channel, water is pumped into the Sunnyvale West Flood Control Channel (NASA ARC, 2010).

#### **4.2.2 Diversion of SWRP Water**

In some years, the SWRP is generally dry by August-September, due to evapotranspiration of water that accumulates during winter months. However, due to significant rainfall received at Moffett Field during the 2010-2011 rainy season, and possible subsurface water infiltration from the Don Edwards San Francisco Bay National Wildlife Refuge ponds to the north, the SWRP was nearly full as of late June 2011; the estimated level of water was 1.1 feet above mean sea level (ft msl), corresponding to an estimated water volume in the SWRP of 100,000,000 gallons.

For sediment removal to take place in summer-fall 2012, water diversion within the SWRP is planned to dry out the sediment sufficiently to allow heavy equipment onto the site without sinking. Two temporary dams will be deployed to partition the SWRP into three zones, as follows: to separate the central portion of the SWRP from the MROSD area (western portion of the SWRP), approximately 900 linear feet (LF) of plastic partitions (Porta Dam<sup>tm</sup>) will be deployed; and to separate the central portion of the SWRP from the northeast (NE) portion of the

SWRP, approximately 100 LF of Porta Dam<sup>tm</sup> partitions with approximately 1,500 LF of Aqua Dam<sup>tm</sup>, a tube-like apparatus, will be deployed (Figure 8). The NASA building located on a peninsula north of the restricted flight line area will be protected from flooding. Dam installations are planned to start in May 2012; dam removal is planned for early October 2012.

For the first phase of SWRP pumping, i.e., from the central portion to the eastern and western portions, the estimated volume of water to be pumped is 70,000,000 gallons, assuming a water elevation of 1.1 ft msl. For this volume, a nominal flow rate of 3,800 gpm would correlate to about 15 days of active pumping. ITSI will pump from one pump station with one intake manifold deployed at the deepest part of the SWRP central portion (-3 ft msl) in an area approximately 100 ft from the Levee Road. Water will be discharged to the NE Basin and the MROSD (western) portion of the SWRP through arrays of large-capacity irrigation heads and submerged discharge manifolds. The pump discharge will be split to send roughly 2,500 gpm to the NE Basin and 1,300 gpm to the MROSD portion, to account for the different respective capacities of those areas.

The area for the pumping station will be cleared of pickleweed using labor-intensive methods (non-mechanized tools) and a biologist will be present to monitor the clearing. A pad will be graded with crushed rock to provide a hard, level workable site sufficient for mounting the pump trailer. The pump station will be secured with a temporary chain-link fence and outfitted with sanitation facilities. For the first phase of pumping, an array of irrigation heads and a submerged discharge manifold will be installed at both the NE Basin and at the MROSD area (Figure 8).

Water discharged through the irrigation heads will be regulated and directed at an appropriate angle to provide a low-impact spray of water, thereby preventing disturbance of bottom sediments in the receiving water body. The submerged intake and discharge manifolds will be constructed of approximately 10-inch-diameter plastic piping and placed on the pond floor (in uncontaminated areas) so that the water is pulled (or pushed) without disturbing the surrounding soft sediment. The manifolds will be anchored with rip-rap as necessary. Following excavation of contaminated sediment and site restoration in the SWRP central portion, the pumping scheme

will be reversed so that water is pumped from the NE and MROSD portions of the SWRP to the central portion.

Sampling and testing will be conducted to monitor water quality in the SWRP. Samples will be collected at three pond locations during two events for each of two phases of pumping. Samples will be submitted to a testing laboratory to be analyzed for the IR Site 25 COECs. Table 3 lists the COECs with the analytical methods to be used and the related method detection limits (MDLs). A field meter will also be used to monitor turbidity. Figure 9 presents an inspection form to \*be used during SWRP pumping.

A security force will be provided during off hours, including nights and weekends, to prevent vandalism of temporary facilities.

#### **4.3 PROFILING SEDIMENT FOR WASTE DISPOSAL**

Before excavation activities begin, ITSI will coordinate with waste disposal companies to profile (characterize) the sediments to be excavated for disposal. Previous results of chemistry testing of the sediments have been forwarded to waste vendors for discussion. For the site history and the anticipated volume of sediment to be removed (33,000 CY), waste disposal facilities will require 132 samples to be collected. Four-way composites will be created, resulting in 33 samples to be tested for total metals including lead and zinc. Leaching tests including the Toxicity Characteristic Leaching Procedure (TCLP) and the Waste Extraction Test (WET), as described in the California Code of Regulations (CCR) Title 22 will be conducted if warranted. The sampling activities will be coordinated with the ROICC at Moffett Field.

#### **4.4 PRE-CONSTRUCTION PHOTO SURVEY**

A pre-construction photo survey of the existing infrastructure at the project site, including NASA ARC buildings, fences, pavements, walkways, etc., and Bay Trail levee roads and appurtenances, will be conducted so that possible impacts related to RA activities can be assessed and that appropriate repairs/restoration can be made at the end of the project. This effort will be coordinated with NASA ARC and MROSD.

#### **4.5 PERMITS AND NOTIFICATIONS**

Site operations will be performed in coordination with the Navy Remedial Project Manager (RPM), the Navy ROICC, and NASA ARC representatives. The following permits/notifications are anticipated for the project:

- A NASA construction permit will be acquired. A Planning Clearance Application will be completed and submitted to NASA ARC through the Navy ROICC. The application will include requests for a construction permit, excavation permit, and safety clearance permit. The application requires review and approval by the ARC permit planning board. Field construction work will not begin until the required permitting action is approved and a signed work permit is issued by the NASA ARC Chief Building Official.
- If any hot work (welding, cutting, etc.) is required, a hot work permit will be coordinated with the NASA ARC Safety Group.
- A permit from NASA ARC will be required for using two-way radios.
- A Permit to Enter from MROSD will be obtained to conduct remediation activities on the western area of the SWRP.
- The Navy will notify stakeholders of Bay Trail closures 3 weeks in advance (Section 5.2).

Field activities will comply with the requirements of all jurisdictions, as documented in the applicable or relevant and appropriate requirements (ARARs) listed in the Final Record of Decision (ROD).

#### **4.6 UTILITY CLEARANCE**

ITSI has reviewed utility plans provided by NASA ARC in an attempt to identify any known utilities in or near the areas of proposed excavation. The NASA utility information is indicated in the RD drawings (Appendix D). The construction company performing excavation activities for ITSI will notify Underground Service Alert of Northern California and Nevada (USA North) and use a specialty utility survey company to locate and mark underground utilities in the vicinity of excavation work. As indicated in the RD drawings, a buried natural gas transmission line owned and operated by the Pacific Gas and Electric Company (PG&E) runs through IR Site 25. PG&E will be contacted directly to inspect the site during excavation operations in the vicinity of its pipeline.

## **5.0 SITE MANAGEMENT**

Site management topics are presented in this section. Health and safety measures including establishing and maintaining Exclusion Zones (EZs) are discussed in detail in the APP and SHSP (ITSI, 2011a, 2011b).

### **5.1 SECURITY, ACCESS, AND TRAFFIC CONTROL**

All persons entering the NASA ARC-controlled portion of Moffett Field will have security badges issued by NASA ARC. Once inside the facility, all vehicle traffic will strictly observe NASA traffic control requirements. Truck traffic will adhere to restrictions related to the use of specific gates for access to and egress from Moffett Field. In accordance with arrangements between the Navy and NASA, Ames Gate 17 (“Wright Avenue Gate”) on the west side of the facility will be used for ingress and egress for heavy equipment deliveries and waste T&D.

Project personnel and vehicles will proceed to work areas and staging areas over established roadways or areas previously cleared for use. During the pre-construction phase of work, ITSI will coordinate with NASA and the Navy ROICC to establish truck holding areas. During high-volume T&D operations, traffic controls will include signage and flagmen. Traffic controls will be consistent with guidance from the *California Manual on Uniform Traffic Control Devices for Streets and Highways* (California Department of Transportation [Caltrans], 2010). Critical traffic control points are indicated on Figure 6.

### **5.2 ACCESS AND SECURITY WITHIN IR SITE 25**

The EDM portion of IR Site 25 is within the confines of NASA-controlled Moffett Field but is open land (not fenced). Access from NASA-controlled Moffett Field to the SWRP is restricted by chain link fences and a series of gates. However, the general public (bicyclists and hikers) has access to the SWRP area from both the east and west via the San Francisco Bay Trail.

During active excavation and T&D operations, local site access will be controlled by temporary barriers including warning tape and signage. During off-work hours, any work areas near existing roadways that could impact vehicle traffic will be demarcated with battery-operated

reflectors. Gates between the SWRP and Moffett Field proper will be kept closed except when project vehicles are crossing.

For excavation and T&D activities at SWRP, the San Francisco Bay Trail will be closed near the IR Site 25 perimeter on the east and west sides during work hours (Figure 6). Notice will be provided to the USFWS, ABAG, and MROSD at least 3 weeks in advance of these closures. Notices of the trail closures also will be made at Restoration Advisory Board (RAB) meetings and posted on the site and at the Don Edwards Visitor Center to alert trail users to the trail closings.

### **5.3 EQUIPMENT AND PERSONNEL DECONTAMINATION FACILITIES**

ITSI will use dry decontamination methods to the maximum extent possible to clean excavators, backhoes, bins, trucks, and associated tools and equipment. Should decontamination fluids be used, equipment decontamination areas will be established near the excavation sites and at the staging area to avoid any tracking of sediment off site. Personnel decontamination areas may be established at work areas, if required by the APP and SHSP (ITSI, 2011a, 2011b). If feasible, WATS effluent water will be used for equipment decontamination, as a “green and sustainable remediation” (GSR) activity.

Decontamination water will be contained, collected in a storage tank, and reused on site or disposed of at a licensed disposal facility, based on characterization. Solids collected in the decontamination area will be stored and characterized for subsequent reuse or disposal.

### **5.4 TEMPORARY UTILITIES DURING CONSTRUCTION**

ITSI will use the following utilities on site during project execution:

- Construction water (for dust control and compaction of backfill). Water will be imported or obtained from WATS effluent.
- Communication. Two-way radios and cell phones will be used for on-site communications as required.
- Electrical. A power drop may be available near NA289 to power the field trailer. As required, generators fueled by diesel or gasoline will be used for electrical power.
- Potable water. Bottled water or potable water jugs will be provided for site workers.

- Sanitation facilities. Portable toilets and refuse containers will be set up near the work sites. Portable toilets will have non-potable water for hand-washing.

## 5.5 WORK HOURS

Work hours for site activities will be Monday through Friday, 7:00 A.M. to 4:00 P.M.

## 5.6 CONTINGENCY PLAN

The likelihood of unplanned releases of contaminants that could threaten human health or the environment is considered low, due to the shallow excavation depths at most sites and the non-volatile properties of the COECs. Amounts of fuel that will be stored at the site will be minimal, and any fuel storage tanks will have dedicated containment. The buried PG&E high-pressure natural gas transmission line will require special coordination with PG&E.

In case of emergencies, ITSI will implement the emergency response measures described in Section 11.0 of the SHSP (ITSI, 2011b). Measures to protect water resources during the work are described in Section 7.2 of this document. A Storm Water Pollution Prevention Plan (SWPPP) will be developed by the excavation subcontractor to describe the best management practices (BMPs) that will be put into place to protect surface water resources and control erosion (Section 8.2).

## **6.0 FIELD ACTIVITIES FOR REMEDIAL ACTION**

This section describes the activities to be completed in the field for the RA at IR Site 25. As previously described, Appendix D includes the RD drawings that indicate the size, location, depth, and volume of the sediment polygons to be excavated.

### **6.1 MOBILIZATION FOR EXCAVATION**

After the Navy provides a notice to proceed (NTP), ITSI will mobilize personnel and equipment to the project site. A field trailer will be set up at the area near facility NA289 (the SWSB). A diesel-fueled generator or a tie-in to the local NASA ARC power system will be set up to provide electricity to the trailer. Portalets and hand-washing stations will be installed near the trailer and at additional locations throughout the site as necessary. Use of Ames Gate 17 at Wright Avenue for ingress and egress will be coordinated with NASA ARC security.

Secured storage containers will be mobilized to the job site as needed to store materials and small tools and equipment. Temporary fencing will be set up as necessary to protect possible ecologically sensitive areas, and to secure equipment and materials from theft or vandalism.

### **6.2 PRE-CONSTRUCTION MEETING**

ITSI will conduct a pre-construction meeting to be attended by NAVFAC SW, the Moffett Field ROICC, key ITSI staff, and key subcontractors to ITSI. The meeting will address health and safety considerations, site security, scope of work, lines of communication, and the contract requirements to be fulfilled, including QC procedures.

### **6.3 CLEARING AND GRUBBING**

Some clearing and grubbing of areas at or near sites to be excavated will be required. All activities will be conducted under the supervision of a biologist. The approach for vegetation removal is described in the BA (Appendix F).

### **6.4 EXCAVATION OF CONTAMINATED SEDIMENT**

ITSI will excavate the polygons as indicated on the RD drawings (Appendix D). Site conditions at IR Site 25 at the time of excavation, including the presence of surface water and/or wildlife, will dictate the sequence of excavation. Possible tidal connections also will be assessed.

Prior to excavation, each area to be excavated will be demarcated with construction stakes using the coordinates for each polygon corner derived from the Navy CAD/GIS system. This effort will be conducted in the field by a state-licensed surveyor. The areas to be excavated will be inspected by a botanist familiar with local saltwater and freshwater marsh vegetation to record the types and density of plants present. Photographs will be used to support and document the inspections.

If standing water is present, dewatering operations using localized temporary berms or other isolation methods will be considered. For saturated or soft-ground conditions, the use of low-ground-pressure (LGP) earthmoving equipment and trucks will be considered (timber crane mats also have been used successfully in other wetland reclamation projects in the south San Francisco Bay region). For handling saturated sediment, the excavator may be equipped with a perforated “mud” bucket to allow excess water to drain back into the hole before the material is moved. Long-reach excavators will be used to dig hard-to-reach areas. Some temporary access roads may be required; these roads will be removed at the end of the excavation activity. When the areal and vertical extents of excavation for a specific polygon has been reached, based on construction stakes set in the field, confirmation samples will be collected from the floor of the polygon (Section 6.4.3).

#### **6.4.1 Possible Unknown Site Features**

If any leach field lines, sumps, vaults, or other underground conveyances or containers are found during excavation activities, ITSI and the Navy will discuss the situation and agree on an approach to properly decommission the feature. Options will include removal and backfilling with clean material where possible, or the use of pressure-grouting equipment to inject grout/cement or neat cement where excavation is not feasible.

#### **6.4.2 Temporary Sediment Laydown Area(s)**

As necessary, and depending on the presence of water, one or more temporary laydown areas will be installed. A proposed location for a central laydown area is indicated on Figure 4. The volume of sediment to be stockpiled and the laydown area locations will be selected based on waste characterization sampling (scheduled for February-March 2012) and the site conditions

(e.g., degree of saturation in sediment to be excavated; presence of vegetation). These factors will affect the volume of sediment to be stockpiled and the size and locations of laydown areas.

Stockpiles may be located in areas slated for excavation, with confirmation sampling conducted after removal of the stockpile (and the underlying contaminated sediment), to verify that clean conditions have been attained. For stockpiles located outside areas slated for excavation, confirmation samples will be collected (after stockpile removal) on 60-foot centers to prove that no contaminants exceeding upper bound RGs remain. To contain water, laydown areas will be bermed and lined with high-density polyethylene (HDPE) liner. The planned maximum duration of on-site storage will be six months.

#### **6.4.3 Confirmation Sampling and Approval to Backfill**

After initial excavation is completed at each polygon, confirmation samples of sediment will be collected from the excavation floor. Approximately 170 samples are currently planned, based on the current excavation configurations (see Appendix D, Figure 3). Samples will be submitted to a stationary testing laboratory and analyzed for concentrations of COECs. The SAP (Appendix B) presents details on the confirmation sampling program, including: sample design; figures indicating planned sample locations; sample procedures; data quality objectives (DQOs); lists of analytes; laboratory RLs; data handling; data validation; and database management.

If COECs are reported at concentrations above the corresponding upper-bound RGs in the confirmation samples, the associated polygon(s) will be overexcavated in 0.5-ft increments and another round of confirmation samples will be collected. The process will be repeated as necessary until all results are equal to or less than the upper bound RGs. Excavations will not extend laterally beyond the planned polygon boundaries indicated in the CSPs (Appendix D). Per the ROD, attaining the upper bound RG at each sample at each polygon will result in attainment of the site-wide (lower bound) RG (Navy, 2010).

Analytical results for the confirmation samples will be reduced to provide easy-to-read tables that also list the upper-bound RG for each COEC. The tabulated data will have been entered into

a database and undergone Stage 2A validation as described in USEPA guidance (USEPA, 2009). The data tables will be reviewed by the Navy for internal check, then forwarded to the regulatory agencies for 24-hour review. Backfill activities will then proceed.

#### **6.4.4 Excavation Security**

The excavation areas are generally inaccessible or are surrounded by chain link fence and gates. Gates will be kept closed during working hours. The San Francisco Bay Trail will be closed to the public during portions of excavation activities (Figure 6). No additional excavation security is anticipated.

### **6.5 BACKFILLING AND SITE RESTORATION**

After sediment excavation activities are completed, excavated areas will be restored to their pre-excavation condition as appropriate and to the extent practicable. Excavated areas that are routinely inundated will not be backfilled. Wetland habitats that include pickleweed and salt grass that are present over much of the SWRP will be re-vegetated (Appendix H). Other restoration activities will include repairs to and restoration of NASA ARC and USFWS infrastructure including roads, fencing, and levees, to restore them to their pre-construction condition.

#### **6.5.1 General Fill Material**

For areas to be backfilled, material from clean, non-vegetated areas at the SWRP will be used as fill. Figure 10 indicates borrow areas at the SWRP. These areas are routinely inundated (and therefore devoid of vegetation); the areas intersect polygons where COEC concentrations were either reported as non-detected or significantly less than the RGs for IR Site 25 (Table 4).

Using on-site material is desirable in that: (1) there will be fewer truck trips and reduced impacts to NASA ARC operations and infrastructure, in contrast to bringing in import from off-site sources; and (2) observations at the site indicate that sensitive habitat flora such as pickleweed flourish in the sediment, suggesting that on-site material will provide conditions conducive to rapid re-vegetation of marsh species.

Prior to use, samples of the planned fill material will be collected from the borrow area footprints and submitted to an analytical laboratory for chemistry testing as described in the SAP (Appendix B). Sampling frequency will be approximately one sample per 500 CY. The analyte list for testing will include the COECs for IR Site 25, plus the standard list of CCR Title 22 metals. Acceptance criteria are discussed in the SAP. In addition to COEC testing, Appendix H describes testing for agronomic parameters that will be useful in evaluating the ability of the fill material to support vegetation.

After all borrow material is removed at each respective borrow area, grading will be conducted to smooth off the edges of the remaining depression (24-inches-deep or less).

## **6.6 DECONTAMINATION OF EQUIPMENT**

All equipment and vehicles that come into contact with contaminated sediment, liquids, and/or infrastructure will be decontaminated in controlled and contained areas before demobilization. Dry brushing or wiping or both will be the primary decontamination methods used (to minimize the volume of rinsate water requiring treatment or disposal). If necessary during periods of rainfall or when significant contamination is present, equipment and vehicles (especially tires) will be washed with a pressure washer over a bermed, lined area. WATS water will be used if feasible. Decontamination will proceed until all sediments and residues are removed. Waste liquids will be contained and disposed of properly.

## **6.7 INSPECTIONS**

Inspections to be conducted during the site remediation of IR Site 25 are described in the QCP (Appendix A).

## **6.8 DEMOBILIZATION**

ITSI will demobilize earthwork equipment and personnel as activities requiring their employment are completed. Upon completion of all site activities, the ITSI field representative will inspect the equipment storage area and sediment laydown areas to verify that all project-related equipment, trash, and debris have been collected and properly disposed.

Demobilization also will include the disposition of government-owned property, if any; removal

of equipment, tools, and supplies; and removal of temporary fencing, traffic control devices, signs, storage containers, portable toilets, and refuse containers. A final site inspection will be held by the Navy, ITSI, and other stakeholders (NASA ARC, MROSD) as may be required.

## **7.0 WASTE MANAGEMENT PLAN**

Waste materials generated during this project may include: vegetative matter from clearing and grubbing; surplus sediment or other excavated materials; contaminated sediment; contaminated waste water; and other construction/demolition debris. Wastes will be characterized and disposed in accordance with appropriate regulations under the Resource Conservation and Recovery Act (RCRA) and CCR Title 22. This section outlines waste profiling, transport, and disposal procedures.

### **7.1 WASTE PROFILING**

As previously discussed, sediments will be characterized (profiled) for disposal in accordance with applicable regulatory and disposal facility criteria. ITSI will consult with the disposal facilities on appropriate methods of characterizing the sediment for off-site disposal. As previously described, ITSI will conduct a sampling effort to characterize the sediment prior to excavation, to better plan the excavation sequence and T&D operations. Results will be compared to EPA 261.20 Subpart C and/or CCR Title 22 criteria to assess the hazardous-waste status of the material.

On-site treatment of sediments with high concentrations of lead will be considered, based on the volume and the cost of treatment versus direct disposal. As noted above, results of leachability tests as described in the recent pre-design report indicated that lead and zinc at IR Site 25 do not appear to leach, and therefore treatment may not be necessary (KCH, 2011). Leachability of COECs and possible benefits of lead stabilization will be further evaluated after consultation with waste disposal vendors.

### **7.2 T&D COORDINATOR**

A T&D Coordinator will manage sediment T&D activities, including contacting and scheduling the trucking companies and coordinating profiles and manifests with the Navy BRAC PMO-West Caretaker Site Office (CSO), currently housed at former Naval Station Treasure Island. No shipments of waste will leave the site without a Navy signature.

The T&D Coordinator will direct and track all shipments and will provide a report to the QCM detailing the specifics of the management of the waste, including tonnage and date of shipment on each day that materials are shipped. The T&D Coordinator will ensure that the Navy coordinator receives the proper copies of signed manifests (after generator and transporter have signed) as well as all waste acceptance letters and certificates of disposal/destruction. The T&D Coordinator will receive the waste acceptance letters from the disposal facilities for inclusion into the RACR.

### **7.3 TRANSPORT AND DISPOSAL OF SEDIMENT**

Contaminated sediment wastes will be transported from Moffett Field using licensed waste haulers. All shipments will be tracked using the waste manifest signed by the Navy. No waste shipment shall leave Moffett Field without a Navy-signed manifest. All shipments will be disposed of at licensed waste facilities.

### **7.4 VEGETATIVE MATTER**

Vegetative matter from clearing and grubbing operations will be stockpiled temporarily, pending transport to a local licensed facility that accepts vegetative debris. This material will be stockpiled at appropriate locations within the confines of IR Site 25 based on conditions at the time of clearing. Specific locations of laydown areas will be presented to stakeholders for review before grubbing operations are conducted, and stockpiled material will be disposed in a timely manner. Materials to be disposed off site will be inspected to assure that contaminated sediment is not included in the waste stream. Demolition/Construction Debris

General debris will be collected and disposed throughout the project duration and coordinated with the Navy CSO and ROICC and NASA ARC to minimize disruption to Moffett Field activities during transport.

### **7.5 WASTEWATER DISPOSAL**

Liquid wastes generated during the project will be collected and stored on site using roll-off tanks or other transportable tanks. Water will be tested for contaminants including the COECs identified for the site and, if determined to be clean, will be recycled through WATS or disposed of on site after consultation with the Navy, NASA ARC, and regulatory agencies. Analytical methods and related MDLs for this activity will be identical to those for SWRP water diversion

(Table 3). Water containing detectable contaminants will be disposed of off site at a licensed disposal facility.

#### **7.6 ASBESTOS-CONTAINING MATERIAL**

It is anticipated that no asbestos-containing material (ACM) will be encountered during this project. If ACM is encountered, ITSI will contact the Navy to coordinate material handling and sampling using a specialty subcontractor licensed for such activities.

## **8.0 ENVIRONMENTAL PROTECTION PLAN**

This Environmental Protection Plan (EPP) was developed to establish procedures for executing the project in a manner that protects the environment during the contract period. Environmental protection, for the purpose of this project, is defined as maintaining the environment in its natural state and enhancing and/or restoring the appearance of disturbed areas after the project is completed. Practices including use of WATS water for dust control and use of “clean” diesel fuel for powering heavy equipment will be implemented where feasible in an effort to assist the Navy with its GSR program.

To accomplish environmental protection, consideration will be given to air, water, and land resources, including management of visual aesthetics; possible natural, historical, and archeological resources; noise; and solid waste. The ITSI Project Manager will implement the EPP so that work is performed in a manner that minimizes the pollution of air, water, and land resources, and complies with federal, state, and local regulations. Recycling will be implemented to the maximum degree possible.

### **8.1 PROTECTION OF AIR RESOURCES**

Project activities will be conducted in a manner that minimizes the release of airborne particulates within or outside the project boundaries. The principal concern for site excavation activities involves controlling dust containing lead during site excavation activities. Air monitoring for dust will be performed in accordance with the approved SHSP (ITSI, 2011b) to cover the extent of the excavation sites and downwind throughout the removal action field activities. All possible precautions will be taken to ensure that dust is not created and that applicable dust criteria are not exceeded.

#### **8.1.1 Dust Control**

During all earth-moving operations, dust control will be conducted using wet methods, i.e., water spray. As a sustainability measure, treated effluent from WATS will be used for dust control.

Dust-control measures will be in place at all times while sediment is being excavated, stockpiled, stored, and/or transported. Truck tires will be decontaminated whenever necessary to prevent trackout of dirt and dust. A water truck also will be available on the roadways near the truck access points.

Any temporary stockpiles will be dampened as needed to control dust. Stockpiles of contaminated sediment will be covered with HDPE sheeting and secured with hold-down weights, e.g., sandbags, when not exposed for receiving or moving sediment. At the end of each workday, active work areas will be swept or washed as appropriate to minimize the potential for fugitive dust during non-working hours. Care will be taken to control overspraying and to minimize discharge of dust-control spray water.

### **8.1.2 Burning and Hot Work**

No burning of debris or other material will be allowed. No hot work (work requiring an open flame or posing a potential fire hazard, e.g., welding) is anticipated at this time; however, if hot work is required, a permit to conduct this activity will be coordinated through NASA ARC.

### **8.1.3 Noise**

ITSI will comply with applicable Occupational Safety and Health Administration (OSHA) and local noise standards. Equipment operators, contractors, and other personnel will be required to wear appropriate hearing protection when necessary, as detailed in the APP and SHSP (ITSI, 2011a, 2011b).

## **8.2 PROTECTION OF SURFACE AND GROUNDWATER RESOURCES**

Construction activities will be conducted in compliance with all appropriate federal, state, and local laws regarding potential and actual contamination of surface water and groundwater, and in a manner that will prevent the discharge of pollutants and minimize impacts to water resources. To comply with the substantive requirements of the State of California General Construction NPDES Permit, a SWPPP will be developed by the excavation contractor and will describe the BMPs for erosion control to be carried out during this project. The SWPPP will be forwarded to the regulatory oversight agencies prior to commencement of excavation. In developing the

SWPPP, the *Erosion and Sediment Control Field Manual* (Water Board, 1999) will be used as guidance.

To reduce potential impacts to groundwater quality during excavation, equipment used in excavation activities will be inspected daily for hydraulic oil leaks, and any leaks will be fixed immediately.

### **8.3 PROTECTION OF LAND AND ARCHEOLOGICAL RESOURCES**

Activities at excavation sites will be conducted in a manner that minimizes impact to land resources within and outside the project boundaries. Before-and-after photographs will be provided for each excavation location. Site features including roads and fences will be restored as appropriate.

Archeological remains and artifacts are not anticipated to be encountered at the work sites; however, any structure(s) or artifact(s) of potential historical interest discovered during excavation activities will be carefully preserved in an undisturbed state. The Site Superintendent will report any findings to the ROICC immediately, so that proper authorities may be notified.

### **8.4 BIOLOGICAL AVOIDANCE AND MINIMIZATION MEASURES**

Crucial components to be implemented for a successful RA at IR Site 25 are measures for avoiding and minimizing impacts to flora and fauna. The attached BA (Appendix E) describes the following avoidance and minimization topics:

- A biological education/awareness program for site workers.
- Compliance with the MBTA.
- Measures for listed species, including the salt marsh harvest mouse (SMHM), the CBR, and the CCR.
- Vegetation removal.

The following general procedures will be followed during field activities:

- Silt fences will be installed along access roads that border or cross over vegetation including pickleweed to prevent impacts to wildlife from vehicles and equipment. Silt fences will be monitored at a minimum frequency of once during each active work day.
- Before work begins each day, the qualified biologist(s) will thoroughly inspect the work areas and adjacent habitat areas to determine if SMHMs, CBRs, CCRs, or other special-status species are present in these areas. The qualified biologist(s) will remain on site throughout the duration of earth-moving activities.
- Equipment and vehicles will be confined to the designated access routes, staging areas, and excavation areas.
- The equipment decontamination area will be located in the designated upland staging area, away from wetland habitat.
- Upland routes covered with pavement, bare ground, or non-native vegetation will be used as access routes to the designated staging areas and excavation areas to the greatest extent possible.

Additional measures will be implemented for special status species recognized by the State of California that may be present at Moffett Field, as described below.

- Western pond turtle (WPT). A qualified biologist(s) will be present during all project activities occurring in the marsh areas of the EDM where WPTs could exist. If WPTs are observed, the biologist(s) will relocate them to an appropriate site at NASA ARC as identified by the NASA ARC biologist. Capture will be by hand or net with individuals held temporarily in a secure container until they can be relocated (within 4 hours of capture).
- Burrowing owls: Recent biological surveys have not provided any indications of the presence of burrowing owls. Regardless of the season, additional preconstruction surveys within 3 weeks of initiation of construction will be conducted to identify any active burrowing owl burrows. Should burrowing owls or active burrows be encountered during site work, the on-site biologist(s) will shut down operations to assess the situation in consultation with the NASA ARC biologist, to determine the appropriate method of avoiding or mitigating impacts.

At a minimum, additional avoidance and minimization measures for impacts to burrowing owls will be consistent with measures recommended in the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium, 1993). These measures included the following: (1) no disturbance will occur within 160 ft of occupied burrows during the non-breeding season of 01 September through 31 January, or within 250 ft during the breeding season of 01 February through 31 August; and (2) on-site passive relocation will be

implemented if the above avoidance requirements cannot be met.

Relocation of burrowing owls can be implemented only during the non-breeding season. Burrowing owls will be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow needs to be provided for each burrow that will be excavated in the project impact zone. The project area will be monitored daily for 1 week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

- Roosting bats: No lights or any project activity will be allowed at night within 100 ft of any buildings that could be possible roost sites.
- Nesting birds: During the nesting season, a focused survey for nesting birds will be conducted by a qualified biologist for all staging and storage areas, transportation routes, work areas, soil stockpile areas, borrow areas, and all natural habitats within 500 ft of the work area to identify active nests. The survey will be conducted within 14 days prior to commencement of any project activities. If work is stopped for more than 14 days during the nesting season, affected areas will be resurveyed. The qualified biologist must survey the work area. If no active nests are found, no further action will be required. If nesting birds are found, DFG and USFWS will be notified, and work in the vicinity of nesting birds will be at the discretion of the on-site biologist, based on the recommended buffer zones. Work activities will be allowed as long as there are no resulting impacts to the normal behavior of nesting birds.

## **8.5 LANDSCAPE PROTECTION**

ITSI will coordinate with the ROICC prior to excavation activities at each site to identify any land resources to be preserved within the work area. ITSI personnel will mark any areas to be preserved and provide fencing, barriers, or other physical protection. ITSI will minimize damage to land resources within and outside project work areas, and will repair any damage caused to land resources.

## **8.6 PROTECTION OF GROUNDWATER MONITORING WELLS**

Existing monitoring wells are present at various locations on the project site. Locations of these wells are indicated on the CSPs (Appendix D). As part of site preparation prior to clearing and grubbing, wells within or near excavation footprints will be flagged in the field. Care will be taken during all field activities to protect existing wells.

## **8.7 PROTECTION OF UTILITIES**

The RD drawings (Appendix D) present information directing replacement of existing utilities that could possibly be damaged during RA activities. Of particular note is the buried PG&E gas line; precautionary steps addressing this line, including hand digging and coordinating inspections by an on-site PG&E representative, are included on Sheet G-2 of the RD drawing set.

## **8.8 POST-CONSTRUCTION CLEANUP**

Following the completion of field activities, and subject to input from the Navy, ITSI will perform final site cleanup and will leave work areas in a restored condition.

## 9.0 POST-REMEDIAL ACTION SUBMITTALS

ITSI will prepare a RACR that describes in detail the site operations performed for the RA at IR Site 25. The RACR will include site diagrams; results of chemical analyses and any other tests; confirmation of the do-not-exceed and site-wide average RGs; amounts and types of materials disposed; a list of disposal facilities used; copies of waste manifests; copies of weigh tickets; and certificates of disposal/destruction/recycling. Specific to Moffett Field, the RACR will document final (polygon) excavation limits and quantities and the results of confirmation samples verifying that COECs were removed from each excavation to the not-to-exceed RGs.

After internal checks, the Navy will submit the draft RACR to stakeholders for review and comment. The draft final version will incorporate resolved regulatory agency comments. All tabular and spatial data and environmental restoration program documentation will be entered into the Naval Installation Restoration Information Solution (NIRIS) system and documented within the RACR.

A QCSR addressing results of confirmation sediment sampling will be developed by the Project Chemist and appended to the RACR. The QCSR will include a detailed report of data precision, accuracy, and completeness for each type of analysis. An assessment of laboratory practices used to assess data precision, accuracy, and completeness will be included in the report, along with a description of applicable field quality control. The QCSR will include a summary of any performance and system audits, corrective actions, and nonconformances.

## 10.0 REFERENCES

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Western Regional Climate Center, [wrcc@dri.edu](mailto:wrcc@dri.edu). 2010.