

Technical Memorandum

Initial Systematic Project Planning for the Weeks Neighborhood and Ravenswood Business Brownfield Projects

To

The City of East Palo Alto, California

From

U.S. Army Corps of Engineers, Innovative Technology Advocate (ITA) Triad Team

Dated

March 18, 2003

1.0 Introduction

1.1 Purpose

The purpose of this initial systematic planning memorandum is to provide programmatic and project specific recommendations for the City of East Palo Alto's Brownsfields environmental restoration projects. These proposals are presented in the context of the Triad approach – a strategic framework that integrates systematic project planning, the use of dynamic work plan strategies, and the application of real time measurement techniques. The advice detailed in this memorandum is tailored for two specific revitalization areas in the City of East Palo Alto; the Weeks Neighborhood and the Bay/Clarke Block of the Ravenswood Business District.

The recommendations provided are very general in nature because limited information has been provided to date concerning past use and planned reuse for these sites. More information is required before a detailed systematic plan for a monitoring and measurement program to support site remediation can be developed. The Corps Innovative Technology Advocate (ITA) Triad team can assist in the actual detailed planning (as funding allows) at the request of the City of East Palo Alto. This technical memorandum was prepared on behalf of the United States Environmental Protection Agency (EPA), Technology Innovation Office (TIO) Brownfield Technical Support Center (BTSC).

1.2 Triad Approach Advantages for Brownfields Projects

The Triad approach emphasizes the importance of systematically identifying and managing project decision uncertainties, including sampling representativeness for data sets. It highlights the contributions of emerging technologies (such as field analysis and decision-support software) and multidisciplinary expertise to the production of accurate conceptual site models that evaluate heterogeneities and other variables critical to successful site restoration. Benefits associated with the use of the Triad approach include careful focus on specific project objectives, which ensures cost effective and timely completion of environmental restoration. This is achieved by stakeholder involvement in goal development, early identification of criteria, as well as detailed project planning prior to collecting field data. These benefits can be combined with presumptive remedial measures to allow rapid redevelopment of blighted properties.

1.3 General Site Setting

The City of East Palo Alto is a community that includes residential, commercial and industrial land use. It is located approximately 30 miles southeast of San Francisco and includes a three-mile section of the San Francisco Bay shoreline. A small stream, San Francisquito Creek, lies along the south boundary of the City. Most of the City is highly urbanized and surface water runoff is directed to the Bay via a storm water collection system. Groundwater is encountered approximately 20 feet below the ground surface.

The two major environmental restoration projects in the community involve the former Romic chemical factory and the Rhone-Poulenc pesticide plant.

1.4 Programmatic Environmental Restoration Strategies

The City of East Palo Alto strives to return blighted properties to productive use within the context of a Master Redevelopment Plan. This requires close coordination of environmental restoration activities, realistic property development plans, adequate financing and cooperative landowners.

Efficient environmental restoration activities will facilitate the overall revitalization. For small residential and commercial parcels, such as those found in the Weeks Neighborhood and the Ravenswood Business District, Triad approach concepts can initially be applied during the Phase 2 Environmental Assessments. These investigations can be made more effective by applying systematic project planning, dynamic work plan strategies and the use of real time measurement techniques. The resulting investigation will better address project goals which will allow remedial activities, if necessary, to be conducted more effectively. The Triad approach concepts can also improve the effectiveness of presumptive remedial approaches, such as soil excavation and disposal (i.e. “dig and haul”). Post remediation groundwater monitoring can also be focused and improved with new analytical approaches.

2.0 The Weeks Neighborhood

2.1 Site History and Description

The Weeks Neighborhood includes residential and commercial parcels in the eastern section of the City of East Palo Alto. Historically this area was used for commercial flower production, which has resulted in pesticide contamination throughout the area. Master planning goals in this community center on returning underutilized parcels to productive reuse.

2.2 Conceptual Site Model

Information gathered to date suggests that organochlorine (and perhaps organo-phosphorus) pesticides were released to the environment during application and preparation at each individual commercial facility. The pesticides at these former facilities are likely to be large molecular weight chemicals that bind strongly to soil. They are also very persistent in the environment. As a result, the pesticides are likely to be found in near surface soils and would not generally be expected to migrate to groundwater. Soil contamination is expected to be very heterogeneous and site use patterns will have a significant impact on areas expected to have hot spots. Thorough upfront systematic planning is crucial in the development of a sampling and analysis design that is representative of the site and its environment in the context of project

decisions. The Corps ITA Triad team will need to review all available background information on site past and future use, specific pesticides of concern, and potential human health and ecological receptors before developing a more detailed site conceptual model to guide selection of a sampling and analytical approach.

2.3 Project Objectives

The goals of the City of East Palo Alto are to cost effectively redevelop neighborhood parcels as they are made available by property owners. Emphasis is on residential development. Specific goals include maximizing the cost efficiency of site characterization and any subsequent remedial action. Site specific remediation and redevelopment strategies will influence the selection of a sampling and analysis design and will need to be discussed in more detail.

2.4 Restoration Strategies

The systematic project planning should begin by gathering all available data on historical operations, contamination, and remediation conducted to date. The project team will develop a comprehensive conceptual site model that can be updated as data is collected in the field. An electronic database should be established if possible. Coordination will need to occur with regulatory agencies to establish soil action levels and likely remedial actions. Strategies for applying field analytical procedures during investigation and remediation activities will need to be developed. Incorporation of decision criteria in the project work plan will guide the actions of the field investigation team. The project team will prepare a sampling and analysis design that is representative of the site in the context of specific project decisions. The extent of pesticide contamination can be effectively established by utilizing immunoassay or GC field analyses, combined with a quality control program to ensure that all data is of adequate quality in relation to site specific data uses. Use of near real-time measurement technologies will allow the team to control for measurement error by increasing the density of measurements and utilizing the near real-time data to guide sample selection in the field.

2.5 Restoration Decision Criteria

Decision criteria will be established to allow investigation or remediation actions to accommodate changing conditions. Examples of likely decision criteria include:

- Sampling to continue until extents are established with field analytical methods.
- Area of high concentrations (“hot spots”) to be defined to establish variability.
- Update analytical procedures in the event unexpected contaminants are found.
- Excavation extent to be established by field analytical methods.
- Excavated soil to be profiled for disposal at various receiving facilities using field analytical methods.
- Confirmation sampling to be performed to document clean closure of site.

3.0 The Bay/Clarke Block of the Ravenswood Business District

3.1 Site History and Description

The Bay/Clarke Block of the Ravenswood Business District includes residential and commercial land use and is located in the eastern section of the City of East Palo Alto. This area includes auto recyclers and other light industrial activity. Pesticide contamination is associated with the rail line that served the former Rhone-Poulenc plant. Considerable amounts of chemical and hydrogeologic data have been gathered during environmental restoration activities at the near by Romic chemical factory and the Rhone-Poulenc pesticide plant.

3.2 Conceptual Site Model

The activities associated with automobile recyclers may release gasoline, motor oils, hydraulic oils, battery acids, battery lead, and chlorinated solvents to the environment. The quantities of these releases are not known, but would generally be expected to be small in keeping with the size of the businesses in the Bay/Clarke Block. Gasoline, battery acid and chlorinated solvents are relatively mobile in the environment and could migrate to groundwater if present in sufficient quantities. These contaminants are susceptible to degradation and are moderately persistent in the environment. The oils and lead are less mobile and would normally be found in surficial soils. Heavy oils and lead are persistent in the environment. Pesticides associated with the rail line should be found in near surface soils, as discussed in Section 2.2 above. Soil contamination is expected to be very heterogeneous and site use patterns will have a significant impact on areas expected to have hot spots. Thorough upfront systematic planning is crucial to construct a sampling and analysis design that is representative of the site and its environment in the context of project decisions. The Corps ITA Triad team will need to review all available background information on site use, specific contaminants of concern, and potential human health and ecological receptors before developing a more detailed site conceptual model to guide selection of a sampling and analytical approach.

3.3 Project Objectives

The goals of the City of East Palo Alto are to cost effectively redevelop parcels in this neighborhood as they are made available by property owners. Emphasis is on residential and commercial development. Specific goals include maximizing the cost efficiency of site characterization, as well as for subsequent remedial action. Site specific remediation and redevelopment strategies will influence the selection of a sampling and analysis design and will need to be discussed in more detail.

3.4 Restoration Strategies

The systematic project planning should begin by gathering all available data on historical operations, contamination, and remediation conducted to date. The project team will

develop a comprehensive conceptual site model that can be updated as data is collected in the field. An electronic database should be established if possible. Coordination will need to occur with regulatory agencies to establish soil and groundwater action levels and likely remedial actions. Strategies for applying field analytical procedures during investigation and remediation activities will need to be developed. Incorporation of decision criteria in the project work plan will guide the actions of the field investigation team. The project team will craft a sampling and analysis design that is representative of the site in the context of specific project decisions. Field analytical technologies are available for the potential contaminants at these sites:

<u>Contaminant</u>	<u>Analytical Technology</u>
Petroleum products	Immunoassay and/or GC
Acid	Electronic probes
Lead	X-Ray Fluoresce
Chlorinated solvents	Field Portable GC/MS and/or GC
Pesticides	Immunoassay and/or GC

Sample collection in both soil and groundwater can be accomplished using direct push equipment. As always, quality control measures must be detailed in the investigation work plan to ensure that all data gathered is appropriate for decision making.

3.5 Restoration Decision Criteria

Decision criteria will be established to allow investigation or remediation actions to accommodate changing conditions. Examples of likely decision criteria include:

- Sampling to continue until extents are established with field analytical methods
- Areas of high concentrations (“hot spots”) to be defined to establish variability
- Update analytical procedures in the event unexpected contaminants are found
- Excavation extent to be established by field analytical methods
- Excavated soil to be profiled for various disposal options using field analytical methods
- Change assumptions on possible contaminant transport based on unexpected groundwater flow direction
- Discovery of extensive contamination might trigger data gathering to support risk assessment evaluations
- Confirmation sampling to be performed to document clean closure of site

4.0 Recommendation Summary

Programmatically, Triad approach concepts are well suited to improving the effectiveness of the following activities:

- Phase 2 Environmental Site Assessments
- Remedial action using presumptive approaches

The Triad approach can be used to design sampling and analysis strategies that are focused toward obtaining “representative” data sets. A variety of decisions are typically made over the course of site investigation and cleanup, and each may require data sets with different representativeness. For example, a data set representative of risk assessment decisions (a statistically random data set representative of an average contaminant concentration over some specified exposure unit) will not be representative of cost-effective remedial design (requiring non-random data representative of contaminant locations, mass, and concentration extremes). Data representativeness is therefore meaningful only if sufficient up-front planning has defined the scale of intended decision-making, which is then used to guide data collection activities. The Corps can work with the City of East Palo Alto to assist with definition of project specific data collection objectives and initial design of a representative sampling and analysis strategy.

Systematic project planning

The time and effort used to gather all relevant information, develop conceptual models, and establish clearly defined goals and representative sampling and analysis strategies will result in cost effective and successful environmental restoration activities.

Dynamic work plan strategies

Investigation work plans should establish criteria and decision logic to ensure that adequate data is collected to address project goals. The flexibility provided by real-time analytical technologies will allow the project team to adapt sampling to the changing conditions of the unfolding investigation.

Real-time measurement technologies

Field analytical methods, such as immunoassay, x-ray fluoresce, field GC and GC/MS should be utilized when capable of providing the data needed to achieve project objectives. In many cases it may be advantageous to combine laboratory and field analytical methods to produce collaborative data sets.

5.0 Points of Contact

Please do not hesitate to contact the Corps of Engineers for additional information or clarification. Points of contact are listed below:

Bradley A. Call, P.E.
Corps of Engineers, Sacramento District
916.557.6649
bradley.a.call@usace.army.mil

Kira Lynch
Corps of Engineers, Seattle District
206.764.6918
kira.p.lynch@usace.army