

Phase I and II for Berth 22 Bulkhead Design Project

As a contractor to the Port of Oakland, GAIA Consulting, Inc. conducted a focused Phase I Environmental Site Assessment of the Port of Oakland's Berth 22 property located at 1425 Maritime Street in Oakland, California. The objective of the focused Phase I was to provide baseline information about the property, to assess potential site contamination, which an emphasis on the fill material/soil behind the existing underground bulkhead. The Port is currently designing a new bulkhead as part of reconstruction at Berth 22. The information from the Phase I was used in the design and demolition/reconstruction efforts of the bulkhead.

GAIA's scope of work for the Phase I Assessment consisted of (1) a visual reconnaissance of the subject property and the nearby area; and, (2) a search and review of historical environmental information through Environmental Data Resources, Inc. (EDR) (including Sanborn Fire Insurance Maps), the U.C. Berkeley Map Room, aerial photographs available from Pacific Aerial Survey and the Port of Oakland, and GAIA's previous Environmental Review of the Berths 22-30 for the Wharf Embankment Strengthening Program (WESP).

Once the Phase I Site Assessment was completed, GAIA, performed a Phase II Environmental Site Investigation for the Berth 22 property. The purpose of the Phase II site investigation was to evaluate the distribution of debris/fill and other potential contamination in the soil inland of the concrete bulkhead wall and under the deck area at Berth 22. The investigation addressed an area immediately landside of the existing wharf. This area will require excavation to facilitate construction work. Findings from the Berth 22 Phase I Site Assessment were incorporated into the Phase II investigation.

Field investigation at Berth 22 included installing 17 soil borings using a hollow-stem auger drill rig. Prior to starting fieldwork, all utilities and concrete tie-backs were cleared. GAIA hand measured a sampling grid and identified boring locations using GPS coordinates. Concrete coring was performed in certain areas of the wharf. Due to the potential presence of methane at the site, each bore hole was screened during drilling for methane and organic vapors.

Soil and groundwater samples were collected from each boring and analyzed for metals and Total Petroleum Hydrocarbons. Human and ecological risk assessments were performed to determine potential material reuse. The final Phase II Investigation Report included analytical results with recommendations for material disposal and/or reuse.

Field activities and analytical results associated with the Phase II investigation were summarized in the Phase II Investigation Report. The information obtained in the Phase II study was also used in the design and demolition/reconstruction efforts of the bulkhead.

The investigation at Berth 22 was subsequently expanded to include an investigation along a utility corridor. The utility corridor extended across portion of Berth 23, and required the installation of 6 borings at that berth, as well. The results of the utility corridor investigation were presented in a subsequent report.

Sub-Wharf Environmental Sampling and Risk Evaluation Berth 22 Bulkhead Design Project, Port of Oakland

As a contractor to the Port of Oakland, GAIA Consulting, Inc. conducted sampling of the wharf undercoating at the Port of Oakland's Berth 22. Previous sampling of the material, consisting partially of a tar-coated kraft paper and partially of a tar-like coating, had indicated that the material might contain asbestos, as well as metals and polynuclear aromatic hydrocarbons at levels exceeding human health protection thresholds. GAIA coordinated with the wharfinger for Berth 22 and the Port's diving team to obtain boat access to the underside of the wharfdeck to conduct the sampling effort. The objective of the sampling was to evaluate whether the material would constitute hazardous waste, and whether it would have to be separated from the concrete composing the wharf deck prior to disposal or reuse (crushing) of the concrete.

GAIA collected eight samples, which were analyzed for the constituents of concern. Based on the concentrations detected, we determined that the material would not pose a risk to human health based on incidental exposure (i.e., to local residents outside of the terminal area). We then conducted an industrial hygiene evaluation to assess potential risks to workers associated with demolition and crushing of the concrete. The industrial hygiene evaluation concluded that the material would not pose a risk to workers provided the Cal-OSHA nuisance dust standard was met. We also performed an ecological risk screening to evaluate potential ecological concerns associated with demolition of the wharf deck and potential for reuse of the coated concrete as rip-rap. The ecological screening consisted of an aquatic toxicity analysis and evaluation of four exposure scenarios. Based on the results of the aquatic toxicity testing, the behavior of the material in artificial seawater, and the environmental requirements imposed by the CEQA process, GAIA concluded that the material would not pose an unacceptable risk to the aquatic environment. We also concluded that the material would be classified as a hazardous waste for purposes of disposal, due to high total zinc concentrations.

Environmental and Geotechnical Investigation for the U.S. Army Corps of Engineers– San Francisco District

As a contractor to the U.S. Army Corps of Engineers, GAIA provided environmental and geotechnical investigation as well as project management services in support of the widening of the Inner Harbor Turning Basin (IHTB) Project in Alameda, California. The IHTB project includes widening of the existing turning basin to a diameter of 1,500 feet and deepening of the entire turning basin to elevation -50 feet (MLLW). A number of structures (bulkheads, piers, marginal wharves, and two large dry dock pits) previously existed in the southern and western portion of the investigation area. The former presence of these structures was evaluated to provide detailed information for the design of the new bulkhead and dredging plan for the project. In addition, information was required to complete the environmental characterization of the material to be dredged.

GAIA's responsibility for this project included conducting nine over-water test borings within the project area and providing an environmental summary of the test results. GAIA's subcontractor, Fugro West, Inc. was responsible for the geotechnical analysis of the borings and performing cone penetration tests (CPTs) in the dry dock area of the IHTB. GAIA was also responsible for developing a Quality Control Plan prior to field investigations.

Borings were advanced from a drill rig situated on a drill vessel; borings were extended to penetrate the top of the San Antonio Formation, which was estimated at approximately –30 feet elevation. All borings were located using GPS measurements. Borings were performed primarily to obtain of recent bay deposits (RBD) samples for environmental testing and to help define the RBD/Young Bay Mud interface. The extent of RBD (sediment that may contain anthropogenic chemicals) at each boring location was determined through moisture content analysis by the geotechnical laboratory. Environmental testing was only performed on the RBD. Samples were shipped to a laboratory in Torrance, California for analysis and were tested for DMMO-specified parameters.

Based on previous investigation, the RBD in the dry dock areas of the IHTB is unsuitable for aquatic disposal and needs to be excavated. Therefore, the objective in this area was not to obtain physical samples for further testing but to better define the extent of material to be excavated in the former dry dock areas. CPTs were performed by Fugro West, Inc. from the same drill vessel used to drill the borings. A total of 18 CPTs were advanced within the project area.

Fugro performed the engineering analyses required to provide geotechnical conclusions and recommendations for the project, based on the conditions encountered in the borings and CPTs, and the laboratory test results. Engineering analyses included soil conditions below the former marginal wharf, with a special emphasis on the conditions in the vicinity of the former dry dock area.

A report was prepared for the Corps by GAIA and Fugro, documenting the field activities, engineering analyses, and sample results. The report included a brief environmental section, a geotechnical section, and QA/QC documentation. The environmental section consisted of a brief summary of field activities during the environmental sampling event and summary data tables, which presented chemical results for all samples collected and submitted to the laboratory. Summary tables also included Wetland Cover and Non-cover levels for constituents analyzed. The levels were used for comparison to samples results and for discussion with RWQCB.

UST Site Investigations

As a contractor to the Port of Oakland, GAIA prepared workplans for various UST sites at the 9th Avenue Terminal in Oakland, California. The workplans prepared provided a summary of each UST site along with a proposed course of action. Numerous rounds of investigation had been previously conducted at the site. In order to ensure that proper detail was documented in each workplan, GAIA coordinated with the Port as well as consultants involved in previous investigations at the site. A total of nine workplans were prepared and submitted to Alameda County for approval.

GAIA conducted investigations at the 9th Avenue Terminal for three UST sites. The investigations conducted were based upon the previously submitted workplans. The purpose of the investigation was to determine whether or not the UST stills existed at the site and the extent of contamination within each area. Several test pits were excavated at each using a backhoe. Soil and groundwater samples were collected and analyzed for petroleum compounds. UST investigation reports were prepared for each site documenting the all field investigation and analytical results. One UST was abandoned in place and a formal UST Closure Report was prepared and forwarded to Alameda County on behalf of the Port of Oakland.

Environmental Site Investigation APL Terminal (Berths 60-63), Port of Oakland

On behalf of the Port of Oakland, GAIA performed an extensive subsurface site investigation at the American President Lines (APL) Terminal located on Middle Harbor Road in Oakland California. The APL Terminal consists of Berths 60 through 63 and covers approximately 79 acres, including wharf area. Field activities and tabulated analytical results were provided in a subsequent environmental investigation report. The investigation report included a summary of analytical results, soil types and descriptions, and site conditions. A waste disposal evaluation was also included in the report with various disposal recommendations.

The goal of the preliminary investigation was to identify potential site-related subsurface environmental concerns that may impact future subsurface construction activities at the site. Currently, plans are being developed to modernize and reconfigure the APL Terminal container yard. The proposed modernization requires changing the Terminal boundaries from angled borders to boundaries perpendicular to the wharf face resulting in extensive realignment of various utilities. The objective for this investigation was to perform a general site-wide shallow subsurface investigation to assess the overall likelihood of contamination throughout the shallow soils at the Terminal. Borings were to be located as equidistant as possible within site constraints, represent as many areas of the site as possible. Information from this investigation was used to assess the site constraints and costs involved in relocating the site utilities.

Forty-eight borings, spanning the entire APL Terminal, were drilled during the investigation at the site. Each boring location was adjusted in the field to avoid utility lines, stacked containers, and dangerous high truck traffic areas. A hand-held GPS receiver unit was also used to uniquely identify each boring location. Each boring was drilled using a direct -push method with a Geoprobe truck-mounted unit equipped for continuous coring. Concrete was encountered below the asphalt at some boring locations, therefore concrete coring was also performed. Grab groundwater samples and two soil samples within the vadose zone were collected from each boring for analytical testing.

The schedule for the investigation was extremely compressed, because the Port required an estimate of the costs associated with contaminated soil removal to proceed with the design for the project. To accommodate both the Port's schedule and the Terminal operations, GAIA conducted the field investigation on weekends, during the two biggest rainfall events of the year (over 14 inches of rain fell during the two weekends).

Port of Oakland As-Needed Environmental Services

GAIA currently is the Prime Contractor on an as-needed service contract with the Port of Oakland. GAIA provides project management and technical expertise to the Port of Oakland as part of a team of four consulting companies. In our project management capacity, we develop task order scopes of work and budgets, schedule and monitor on-going work performed by the various consulting firms, prepare project reports, and maintain on-going project-related and administrative contact with the Port. To date, the projects awarded to the team have included:

- Groundwater Monitoring;
- Phase I Property Transfer Assessments;
- Phase II Site Investigations; and,
- UST Investigations

GAIA performed a Phase II investigation for the UP Roundhouse property located at 1407 Middle Harbor Road in Oakland. The Phase II investigation included soil, soil gas, and ground water sampling to assess the potential concerns associated with the former use of this 39-acre property. The Port is contemplating purchasing the property and required an estimate of the potential remediation liabilities associated with the site.

Currently, semi-annual groundwater monitoring is being conducted at the UP Roundhouse site. The purpose of the groundwater monitoring is to track the extent of free product in the groundwater and assess whether there is migration of petroleum hydrocarbons from the free product area across the site.

UP Roundhouse Groundwater and Storm Drain Monitoring

On behalf of the Port of Oakland, GAIA is currently conducting semi-annual groundwater monitoring at the UP Roundhouse site in Oakland, California. The site is located within 100 feet of the Bay and is currently used as a container storage and truck parking facility in support of marine terminal operations in the area. Truck traffic at the site is high. The purpose of the groundwater monitoring is to track the extent of free product in the groundwater and assess whether there is migration of petroleum hydrocarbons from the free product area across the site towards San Francisco Bay.

Free product (heavy hydrocarbons) has been identified in one monitoring well at the site; the amount of product fluctuates from season to season ranging from several inches to multiple feet. GAIA is also responsible for maintaining a skimmer that was placed into the monitoring well.

As part of the same project GAIA performed quarterly visual inspections of 6 storm drain catch basins. Free product had been identified in one of the catch basins. The lines had subsequently been flushed by the Port and the purpose of the visual inspections was to check that the storm drains remained free of product.

UP Roundhouse Storm Drain Investigation and Removal

On behalf of the Port of Oakland, GAIA is conducted an investigation of a storm drain line at the UP Roundhouse site in Oakland, California. As part of a regular sotrm drain visual inspection project, free product was suddenly identified in one of the catch basins being monitored at the site. Multiple attempts were made to identify the source of the thick, tarry product; however, visual (camera) inspection of the lines failed because the material quickly coated the lens of the camera. GAIA worked with the Port and the Port's emergency response contractor to flush the storm drain lines and remove the free product before it could enter the Bay.

Free product reappeared in the storm drains after they had been flushed, and the Port decided to remove the affected segment of the storm drain line and replace it with a new line. GAIA was responsible for overseeing the storm drain line removal and collecting environmental samples of the excavated soil. A portion of the storm drain line (approximately 50 feet in length) connecting two catchbasins, located on the south side of the property, was excavated in December 2002. The storm drain line and the downgradient catchbasin were replaced. GAIA observed and documented the entire construction effort.

Environmental Sampling and Oversight at the Former Seabreeze Yacht Center

On behalf of the Port of Oakland, GAIA conducted environmental sampling and observations of the tunnel sealing construction activities at the intake and discharge tunnels at the former Seabreeze Yacht Center in Oakland. A steam-generation power plant was operated at this site from 1909 through the 1950s. Saltwater was pumped through an underground intake tunnel to provide cooling water for the steam condensers of the former power plant. Used cooling water was then discharged to the Clinton Basin through a separate underground discharge tunnel. Petroleum hydrocarbons, including polynuclear aromatic hydrocarbons, and heavy metals had been detected in the sediments in the tunnels.

Alameda County Health Care Service Agency, Department of Environmental Health (County) there requested that the Port (1) seal both the intake and the discharge tunnels prior to transferring the property, and (2) collect soil and groundwater samples along the intake and discharge tunnels to complete site characterization. A sampling and closure plan (Plan) for sealing the intake and discharge tunnels was prepared by a previous Port Consultant in July 2001. The sampling proposed in the Plan was designed to evaluate the condition of the soil that would be excavated as part of the tunnel sealing activities, and to assess whether there had been a release from the tunnels to the adjacent soils and groundwater. After reviewing the Plan, GAIA concluded that the sampling component could not be implemented as proposed. After consultation with the Port, GAIA proposed collecting sidewall samples from the excavation in the tunnel sealing area, using sampling procedures typically employed during a UST removal. This change in approach was approved by Alameda County.

Both the intake and discharge tunnels were located and sealed by the construction contractor. Five sidewall samples were collected from the discharge excavation area and four were collected from the intake tunnel excavation area. One grab groundwater sample was collected from each excavation. All samples were tested for petroleum hydrocarbons and metals. On behalf of the Port of Oakland, GAIA prepared a final report documenting all environmental sampling as well as construction activities for Alameda County.

Litigation Support

As a contractor to the Port of Oakland, GAIA assisted in developing the technical basis for refuting a claim of lost income due to property contamination. GAIA reviewed the available site data and appropriate regulatory standards and was able to demonstrate that the alleged contamination did not prevent the proposed use of the property. GAIA staff were also called to testify in this case; however, opposing counsel waived its right to examine GAIA staff.

Sampling Plan Preparation

As a subcontractor to ERM-West, Inc., GAIA prepared and assisted in the preparation of various sampling plans designed to evaluate existing conditions at seven Navy facilities located throughout California. The sampling program development effort included defining data quality objectives, developing sampling and analysis protocols, negotiating sample density and frequency with the regulatory agencies, developing a quality assurance/quality control plan, and providing standard operating procedures for the sampling effort.

Compounds of concern addressed by the sampling plans included volatile organic compounds, semivolatile organic compounds, petroleum hydrocarbons, heavy metals (including butyltins and organic lead), cyanides, pesticides, herbicides, PCBs, and dioxins and furans.

Confidential Site Investigation and Remediation Cost Estimate

On behalf of the Port of Oakland, GAIA conducted multiple rounds of site investigation pertaining to site with a known release of heavy metals. GAIA delineated the subsurface extent of the contaminated material, evaluated the concentration and solubility of metals present in the materials, and developed multiple remediation scenarios to provide a basis for cost negotiations in a litigation effort. The cost estimates developed for the remediation scenarios took into consideration the community's interest in waterfront access in this area, the presence of a large stormwater outfall, and the effect of tidal stage on groundwater in the immediate vicinity of the contaminated material. Port legal staff successfully negotiated a settlement with the former operator of the site, and the site is awaiting redevelopment as part of a larger redevelopment effort in the area.

Port of Oakland Wharf and Embankment Strengthening Project (WESP) GIS Mapping, Berths 21-30

As a contractor to the Port of Oakland, GAIA prepared an Environmental Review of Berths 23, 24, and 25 for the Port of Oakland's Wharf Embankment Strengthening Project (WESP). The WESP is a Port Engineering Department project to improve the wharves and underlying embankments in the Outer Harbor Terminals area. The goal of the Environmental Review was to support the design efforts for the Berth 23-25 component of the WESP. By identifying existing environmental concerns, the design can be adjusted to minimize environmental impacts and costs, while safeguarding the construction workers and terminal workers affected by the project. The Environmental Review was prepared to succinctly summarize known data in the project area and immediate project vicinity regarding hazardous material releases to soils and groundwater. For this evaluation, GAIA identified screening levels, where appropriate, for both human health and ecological considerations. Following identification of the key constituents in soil, soil gas and groundwater, GAIA plotted the sample locations on aerial photographs using a Geographical Information System (GIS).

Once the data were linked to the sample locations, sample locations with constituents in excess of a given screening level were displayed. Contour lines were then drawn to encompass the points exceeding the given screening level and exclude the points below the screening level. GAIA also conducted a historical review of the area to provide information regarding environmental concerns. The contour lines and historical information were entered into the GIS and plotted on the aerial photographs. A total of four maps were completed to display information pertaining to groundwater, soil, soil gas and historical data. The maps provide a quick overview of contamination concerns at a given location, and enable engineering staff to easily consider environmental constraints in their design.

The original scope of the work was subsequently expanded to include Berths 21-22, 25, 26, and 30. GAIA compiled the relevant numerical sampling results and historical information for these areas as well, and expanded the existing maps to cover the entire area from Berth 21 to Berth 30.