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PORT OF OAKLAND

Alameda County
OCT 31 2002
Environmental Health

October 29, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: **Monitoring Well Installation and Utility Trench Sampling Workplan**
Gray & Reynolds Development Site, Embarcadero Cove, Oakland

Dear Mr. Chan:

Please find enclosed for your review the report "Monitoring Well Installation and Utility Trench Sampling Workplan, Gray & Reynolds Development Site, Embarcadero Cove, Oakland," dated October 29, 2002. This report is submitted in response to your technical comment letter dated September 11, 2002, in which you allow for the destruction of on-site wells MW-2, MW-3, and MW-4 with the condition that well MW-4 be reinstalled at a nearby location to continue to assess chemicals of concern in groundwater. The workplan also provides a strategy for addressing your other concern, potential impacts to utilities from chemicals of concern in groundwater.

The Port is prepared to implement the workplan as soon as we receive approval from your office. If you have any questions, please do not hesitate to contact me at (510) 627-1184.

Sincerely,

Douglas P. Herman
Associate Port Environmental Scientist

Encl: Monitoring Well Installation and Utility Trench Sampling Workplan, Gray & Reynolds Development Site, Embarcadero Cove, Oakland, dated October 29, 2002

Cc w/encl: Dan Gray
Tom Bender
Barbara Szudy
Betty Graham, RWQCB

Cc w/o encl: Chris Alger, Iris Environmental

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CAMBRIA

October 25, 2002

Mr. Douglas Herman
Associate Port Environmental Scientist
Port of Oakland
EH&SC Department
530 Water Street
Oakland, California 94607

Re: Monitoring Well Installation and Utility Trench Sampling Workplan
Gray & Reynolds Development Site
Embarcadero Cove
1275 Embarcadero
Oakland, California

Dear Mr. Herman:

As requested by the Port of Oakland, Iris-Cambria Environmental JV (Iris-Cambria) has prepared this *Monitoring Well Installation and Utility Trench Sampling Workplan* (Workplan) for the property at 1275 Embarcadero, Oakland, California (the Site). The two purposes of this Workplan are to propose a methodology for determining whether petroleum hydrocarbons in groundwater are migrating offsite and intersecting offsite utility backfill, and to propose final locations for a monitoring well network for the Site.

PROJECT BACKGROUND

A parking lot and a vacant former restaurant currently occupy the Site. The Port of Oakland (the Port) is the owner of the Site, and Gray & Reynolds has proposed commercial redevelopment the Site.

Past investigations include an environmental assessment report completed by Henshaw Associates (2001), a subsurface investigation by Baseline (2001), and a subsurface investigation by Iris-Cambria (2001). The Henshaw Associates environmental assessment reported that an underground storage tank (UST) had been removed from the Site.

Baseline completed fourteen borings to assess soil and groundwater conditions beneath the Site. Baseline reported groundwater between approximately 5 and 8 feet (ft) below ground surface

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(bgs) across the Site and the following subsurface conditions: gravelly fill to 2 ft bgs; a buried concrete/asphalt foundation at several locations at approximately 2 to 2.5 ft bgs; poorly sorted sand (fill material) between approximately 2.5 and 5 ft bgs; and silty sand to silty clay of moderate to very low estimated permeability beneath the fill to the total explored depth of 11 ft bgs.

During the August and September 2001 Iris-Cambria investigation, Iris-Cambria collected soil and grab groundwater samples from five borings, which were submitted for analysis for site specific chemicals of concern (COCs): petroleum hydrocarbons, MTBE and SVOCs. COCs detected in soil samples collected from the borings included TPHg, TPHd, TPHmo, benzene, toluene and xylenes. Neither MTBE nor any SVOCs were detected in soils during this investigation. MTBE was not detected in the grab groundwater samples collected during this investigation, and SVOCs were detected infrequently.

Quarterly Groundwater Monitoring

Iris-Cambria installed five groundwater monitoring wells on the Site to assess groundwater conditions, flow direction and gradient. Wells MW-1 through MW-4 were installed at the Site on October 9, 2001; well MW-5 was installed on April 26, 2002. To assess tidal influences, groundwater was gauged and sampled in monitoring wells MW-1 through MW-4 on October 19, 2001 and at two different tidal stages on December 5, 2001. Groundwater was gauged and sampled from wells MW-1 through MW-5 on May 3, 2002 and wells MW-2 through MW-5 on June 10, 2002 (monitoring well MW-1 was abandoned on May 15, 2002). Samples were analyzed for TPHg, TPHd, TPHmo, BTEX, MTBE and PNAs.

Highest chemical concentrations were found in the north and northeast portion of the Site furthest away from the Bay during both sampling events. MW-1 yielded the most elevated concentrations of TPHg and TPHd, and MW-4 yielded the most elevated concentrations of BTEX constituents. TPHg and BTEX were not detected in monitoring wells MW-2 and MW-5. MTBE was not detected in any well.

Groundwater elevations measured during recent monitoring events reflected a northeastern to eastern groundwater gradient of 0.025 ft/ft. Groundwater elevations observed in MW-5 are consistent with historical groundwater flow directions.

Monitoring Well Destruction

On October 10, 2002, Iris-Cambria destroyed monitoring wells MW-2, MW-3, and MW-4. Well vaults were removed, and a drill rig winch used to remove the full length of the PVC well casing. The well cavities were then filled with cement and capped with concrete to grade.

PREVIOUS STUDIES CONCLUSIONS AND RECOMMENDATIONS

Soils

Based on existing data, maximum chemical concentrations in soil were detected near MW-1, which was installed at the location of a former UST at the Site. All other COC detections in soils were sporadic. Except for soil sampled from the vicinity of the former UST, concentrations of TPH and benzene were less than 5 mg/kg and 0.021 mg/kg, respectively.

Groundwater

Existing Site data suggest that chemicals in groundwater are restricted to the northeastern portion of the Site, near the former UST location. Chemical concentrations detected in groundwater attenuate rapidly in the upgradient (southwest) direction between the former location of MW-1 and the Bay. TPH and benzene are the most commonly detected compounds in Site groundwater. The extent of chemical detections appear generally well defined and decline rapidly to the south, west and east of the likely former UST location.

PROPOSED MONITORING WELL LOCATION

Iris-Cambria proposes to replace well MW-4 with well MW-4a, located in the sidewalk at The Embarcadero approximately 15 feet from MW-4 (Figure 1). Standard well installation procedures are presented in Appendix A.

PROPOSED UTILITY TRENCH SAMPLING

Iris-Cambria proposes to install four temporary groundwater monitoring wells in the utility trench backfill surrounding the storm drain and sanitary sewer located adjacent to the Site on The Embarcadero. Groundwater samples will be analyzed for TPHg, (EPA Method 8015) TPHd and

TPHmo, (EPA Method 8015 with silica gel cleanup) and BTEX (EPA Method 8020). The proposed sample locations are shown on Figure 1. The rationale for the sample locations is presented below.

Rationale for Temporary Well Locations

The utility corridor sampling will help assess whether the backfill materials around the utilities are acting as conduits for the migration of COCs. While the sanitary sewer backfill is likely contacting groundwater, current groundwater data does not definitively indicate that groundwater is intersecting the backfill surrounding the storm drain. To determine whether groundwater is intersecting the utility backfill(s), and COCs are impacting the backfill materials, two sets of grab groundwater samples will be collected using temporary wells. Temporary wells TW-1 and TW-2 will be located at the upgradient property boundary along The Embarcadero and are designed to test whether groundwater present in upgradient utility corridor backfill has been impacted by offsite activities. Temporary wells TW-3 and TW-4 will be located downgradient of well MW-5 and are designed to test whether groundwater present in the utility corridor backfill has been impacted by Site COCs. Specifically:

Temporary Well TW-1: TW-1 will be located within saturated backfill adjacent to the storm drain pipe at the upgradient property boundary of the Site.

Temporary Well TW-2: TW-2 will be located within saturated backfill adjacent to the sanitary sewer pipe at the upgradient property boundary of the Site.

Temporary Well TW-3: TW-3 will be located within saturated backfill adjacent to the storm drain pipe downgradient of monitoring well MW-5.

Temporary Well TW-4: TW-4 location will be located within saturated backfill adjacent to the sanitary sewer pipe downgradient of monitoring well MW-5.

Temporary Well Installation and Sampling Procedures

Each temporary well boring will be advanced into the trench backfill surrounding the utility conduits with a 4-inch diameter boring to the top of native soil. Sampling locations will be determined with the assistance of a professional line locator to insure proximity to the utility

conduits, and approximate conduit depths confirmed by East Bay Municipal Utility District engineering staff. The sample locations will be exposed with water jet cutting and vacuum extraction technologies to avoid damaging the adjacent conduits. The volume of water used in water jet cutting will be gauged and compared against the amount extracted by vacuum extraction to determine the quantity of water potentially not recovered by vacuum. Two-inch screened PVC well sections and associated PVC riser will be placed through the 4-inch diameter excavation. Screen slot size used will be 0.010 inches wide.

The temporary wells will be developed prior to sampling, using a combination of ground water surging and extraction. Surging and extraction continue until at least five times the volume of water not recovered during water jet cutting or three well casing volumes are extracted, whichever is greater.

CLOSING

We are prepared to begin fieldwork on October 30, 2002 upon approval of this Workplan. If you have any questions or comments, please feel free to contact Rob Marinai at (510) 420-3310 or Ian Young at (510) 420-3305.

Sincerely,
Iris-Cambria Environmental JV

Robert Marinai, R.G.
Senior Project Manager

Figures: 1 – Proposed Monitoring Well and Temporary Well Locations

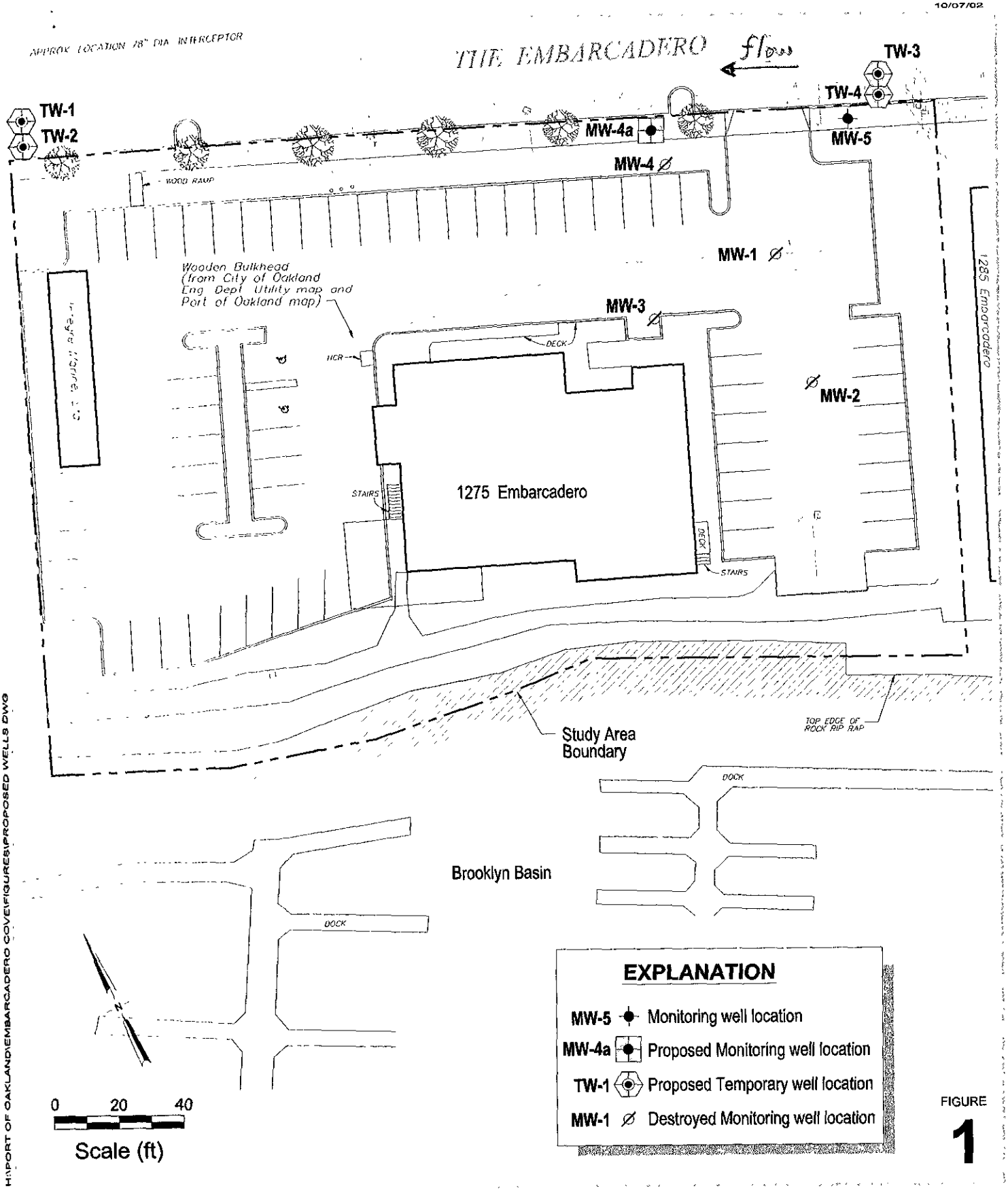
Appendix: A – Standard Field Procedures for Soil Borings and Monitoring Wells

REFERENCES

Baseline Environmental Consulting. *Soil and Groundwater Investigation and Workplan.* Gray & Reynolds Development Project. Embarcadero Cove, Oakland, California. August 13, 2001.

Henshaw Associates, Inc. *Draft Review of Existing Site Conditions and Environmental Risk Evaluation.* Embarcadero Cove Project, Oakland, California. March 14, 2001 a.

Iris-Cambria Environmental, JV. *Site Investigation and Screening-Level Risk Assessment Report.* Gray and Reynolds Development Site. Embarcadero Cove, 1275 Embarcadero, Oakland, California. January 17, 2002 a.



EXPLANATION

- MW-5 — Monitoring well location
- MW-4a — Proposed Monitoring well location
- TW-1 — Proposed Temporary well location
- MW-1 — Destroyed Monitoring well location

FIGURE
1

H:\PORT OF OAKLAND\EMBARCADERO COVE\FIGURES\PROPOSED WELLS.DWG

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1275 Embarcadero
Embarcadero Cove Project
Oakland, California

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Proposed Monitoring Well and Temporary Well locations

ATTACHMENT A

Standard Field Procedures for Soil Borings and Monitoring Wells

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STANDARD FIELD PROCEDURES FOR SOIL BORINGS AND MONITORING WELLS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

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