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November 30, 2010

Mr. Paresh Khatri
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**Subject: RO0000289
CORRECTIVE ACTION PLAN,
OWENS-BROCKWAY GLASS CONTAINER FACILITY.
3600 ALAMEDA AVENUE, OAKLAND, CALIFORNIA.**

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Owens-Brockway Glass Container Corporation is pleased to submit the attached Corrective Action Plan for the above site.

I declare under penalty of perjury that the information and recommendations contained in the attached report are true and correct to the best of my knowledge.

If you need further information feel free to call me at (567) 336-8682.

Sincerely,

Mark Tussing.
Manager, Environmental Affairs

CORRECTIVE ACTION PLAN
TARGETED EXCAVATION WITH IN SITU CHEMICAL OXIDATION
OWENS-BROCKWAY GLASS CONTAINER FACILITY
3600 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

CKG Environmental, Inc.
P.O. Box 246
St. Helena, CA 94574

A Report Prepared for:

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County of Alameda Health Care Services Agency
Environmental Health Department
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CORRECTIVE ACTION PLAN
TARGETED EXCAVATION WITH IN SITU CHEMICAL OXIDATION
OWENS-BROCKWAY GLASS CONTAINER FACILITY
3600 ALAMEDA AVENUE
ALAMEDA, CALIFORNIA

November 30, 2010

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1.0 INTRODUCTION

The following Corrective Action Plan provides a description and approach to complete targeted excavations to remove petroleum hydrocarbon impacted soil and groundwater from soil source areas at the Owens-Brockway Glass Container facility at 3600 Alameda Avenue in Oakland, California. The excavations will be followed by in-situ chemical oxidation to reduce petroleum hydrocarbon impacts in the groundwater plume and smear zone associated with the petroleum hydrocarbon releases. The effectiveness of the remediation will be evaluated through ongoing semiannual groundwater monitoring. The work is being performed as part of the existing investigation and remediation of fuel oil and diesel releases to soil resulting from historic leaks in underground fuel storage tanks. The following site description is excerpted from CKG's Feasibility Study for Fuel Releases dated August 27, 2010 (FS). A more detailed discussion is provided in that document.

1.1 SITE DESCRIPTION

The Owens-Brockway glass manufacturing facility is located at 3600 Alameda Avenue in Oakland, California (Plate 1). The site is located to the north of the Oakland Estuary with Fruitvale Avenue to the west, a Home Depot to the east and residences to the north. Onsite facilities include the operating glass manufacturing plant, warehouses, and offices (Plate 2).

Two former underground fuel storage tank (UST) areas existed at the Oakland plant (Plate 2). The first UST area was located on the west side of the plant and included three fuel oil USTs and potentially one small waste oil UST. Also in this area is a former lube oil tank located adjacent to the plant, between the Batch Building and the Furnace Building. Releases of fuel oil to the subsurface were observed when the USTs were removed.

The second UST area was located near the central part of the plant adjacent to the compressor building. Originally there were four USTs in this area and upon removal a gasoline release to the subsurface was observed. Two 24,000 gallon fuel oil USTs were installed in this area following the removal of the original four USTs, and these two USTs were removed in 1998.

1.2 PHYSICAL SETTING

1.2.1 Regional Physiographic Setting

The property is located adjacent to the Oakland Estuary on the east side of the San Francisco Bay. Prior to development and backfilling, the environmental setting of the Bay margin was estuarine with substantial beaches, and dunes formed. The estuary was later developed as the Oakland Harbor separating Alameda from the Oakland waterfront. Historically the estuary was significantly wider until filling on both sides resulted in the relatively narrow modern channel. Topography slopes slightly towards the southwest.

1.2.2 Soil Conditions

Interbedded clays, clayey silts and sands, sands, and gravels underlie the site. In localized areas fill soil has been placed for building pads or pavement. The fill is underlain by sandy and silty clays to depths of 9-14 feet and may form gradational contacts with underlying sandy clay, gravelly clay, and sandy silt. Geologic cross-sections were developed for the Site Conceptual Model (SCM) dated April 3, 2009 and updated and presented in the FS.

1.2.3 Geologic Conditions

Geologic mapping by Helley and others (1972) show the region to be underlain by the Quaternary Merritt Sand, and sand, silt and clay of younger fluvial deposits. A review of map data compiled by Nichols and Wright (1971) shows numerous meandering marsh land stream channels existed very near the site which deposited fluvial sediments. These old channels have subsequently been obscured by recent development which has obliterated all surface expression

1.2.4 Groundwater Conditions

Groundwater is encountered from 8 to 12 feet below ground surface. Groundwater monitoring initiated in 1986 shows a consistent flow gradient to the south-southwest toward the Oakland Estuary.

1.3 PETROLEUM HYDROCARBON STORAGE

Petroleum hydrocarbons were stored in underground storage tanks located in various areas of the site as shown on Plate 2

1.3.1 Western Fuel Storage Area

One UST site is located on the west side of the plant and included three former USTs, which were used to contain fuel as follows:

- 8,300 gallon lube oil
- 24,000 gallon fuel oil
- 24,000 gallon fuel oil

At the time these USTs were removed in 1987 it was discovered that fuel oil had been released to the subsurface. Owens-Brockway excavated impacted soil at the time the USTs were removed. Past efforts to remove floating hydrocarbon product associated with the fuel oil release have been unsuccessful. This lack of success is mainly due to the clay rich nature of the subsurface and the viscosity of the product. Groundwater monitoring has been ongoing since 1987.

A smaller waste oil UST is thought to have been located adjacent to the forklift ramp next to the bottling plant. The size and status of this UST is not known.

A lube oil UST was formerly located between the Furnace Building and the Batch Building. Details regarding this tank are unknown except that it was reportedly removed.

1.3.2 Central Fuel Storage Area

The second UST area is located near the central part of the plant adjacent to the compressor building. Originally there were four fuel USTs in the area as follows:

- 500 gallon diesel
- 4,000 gallon diesel
- 4,000 gallon gasoline
- 15,000 gallon diesel

When they were removed in 1986 a gasoline release to the subsurface was observed. Owens-Brockway excavated impacted soil at the time these USTs were removed. Two 24,000 gallon fuel oil USTs were installed in this area following the removal of the original four USTs, and these two USTs were removed in 1998. No indications of fuel releases were noted at that time.

1.4 SUMMARY OF HISTORICAL INVESTIGATIONS

The following presents a brief summary of site investigation and remediation history. A more thorough description is provided in the FS.

1.5 WESTERN FUEL STORAGE AREA

In September 1986 Exeltech removed a 16,000 gallon fuel oil UST along with 148 cubic yards of impacted soil. Also at that time they installed a 36-inch product recovery well (PR-1) in the excavation in an attempt to recover free phase fuel oil. Approximately six months after the product recovery well was installed Exeltech installed a product skimmer however no measurable quantity of product was recovered. The difficulty reportedly arose because the recovery equipment could not handle the viscosity of the product. Exeltech implemented triennial groundwater monitoring through 1987 and 1988.

In 1989 the equipment in the first product recovery well was upgraded and a second product recovery well (PR-2) was installed near MW-2. Product recovery efforts were still unsuccessful and abandoned.

In 1997 Kennedy Jenks Consultants (Kennedy Jenks) was retained to resume annual groundwater monitoring and to continue investigative and remediation work at the facility. In August 1997 a limited quantity of free floating product was removed from wells (MW-2, MW-5, and MW-6) using bailers and absorbent pads.

In January 1999 Kennedy Jenks completed an offsite investigation in which five Geoprobe ™ borings were installed on the south side of Alameda Avenue to assess the downgradient extent of petroleum hydrocarbon impacted soil and groundwater. Three of the five borings indicated detectable concentrations of petroleum hydrocarbons.

In June 1999 Kennedy Jenks installed a Petro-Trap™ product skimmer but again the product recovery effort had limited success. In December 2000 Soakease™ absorbent pads were installed in MW-2, MW-5, MW-6, MW-7, MW-8 and MW-9. These pads are still in use. Also in December 2000 Kennedy Jenks installed MW-20 and incorporated it into the monitoring program.

In July 2001 CKG Environmental, Inc. (CKG) was retained to destroy the two unused product recovery wells. This action was taken because of concerns that the wells could act as migration pathways for surface water infiltration.

In May 2003 CKG installed MW-19 on the south side of Alameda Avenue and incorporated it in the annual monitoring program which CKG has been implementing since that time. Additionally, in May 2003 CKG completed Cone Penetration Testing (CPT) to evaluate the distribution of petroleum hydrocarbons in the fuel oil release area and to investigate potential preferential contaminant pathways related to the granular backfill surrounding underground utilities. Fifteen CPT points were installed and soil and groundwater samples were collected.

In April 2006, a work plan to prepare a site conceptual model was submitted to the Alameda County Department of Environmental Health (ACDEH) by CKG. ACDEH responded to the site conceptual model work plan in a letter dated June 20, 2008.

The remediation activities at the site indicate free-phase product at the western UST area. This fuel oil has been difficult to extract from the subsurface due to the subsurface soil conditions at the site which have low permeability and hydraulic transmissivity.

1.6 CENTRAL FUEL STORAGE AREA

In 1986 three USTs (one 350 gallon, two 8,000 gallon and one 12,000 gallon) were removed and replaced with two double walled USTs (one for gasoline and one for diesel which were later removed in 1998). At the time the USTs were removed in 1986 a visible release from the gasoline UST was observed and 350 cubic yards of soil impacted soil were removed. No releases were reported from the tank removal in 1998.

In 1986 Exeltech conducted a subsurface investigation to determine potentially impacted soil and groundwater associated with the gasoline release. The results indicated impacted soil and groundwater, however, free-phase hydrocarbon product was not observed. The three wells located in the gasoline release area were incorporated into the triennial groundwater monitoring program. No other investigations or remedial actions have taken place in the gasoline release area.

1.7 CONCEPTUAL SITE MODEL

All data collected to date has been compiled and presented in the SCM and FS. The historical soil data employed analytical methods that are no longer used for comparison to current regulatory standards. CKG used the data collected in the 2009 data gap investigation to assess the distribution of petroleum hydrocarbons in soil. Soil data from the data gap investigation is summarized in Table 1. Petroleum hydrocarbon distribution as TPHd in soil is illustrated on Plate 3. To illustrate the distribution of petroleum hydrocarbon in groundwater the most recent 2009 groundwater monitoring event (Table 2) was combined with the data from the data gap investigation. Petroleum hydrocarbon distribution as TPHd in groundwater is illustrated on Plate 5. Plate 6 illustrates the distribution of TPHg in groundwater.

1.8 SOIL DATA INTERPRETATION/CONSTITUENTS OF CONCERN

Concentrations of contaminants in soil and groundwater were compared with the May 2008 Environmental Screening Levels (ESLs) established by the San Francisco Bay Region of the Regional Water Quality Control Board (SFRWQCB). For the purposes of this comparison CKG selected Table B-2, Shallow Soil Screening Levels, Commercial/Industrial Land Use and Table F-1b Groundwater Screening Levels (groundwater is not a current or potential drinking water resource). These ESLs most accurately reflect current land use conditions at the site. The following summarizes the established ESLs for the constituents detected during the 2009 investigation:

ESL Table Constituent of Concern	B-2 mg/kg	F-1b µg/l
Benzene	0.27	46
Ethylbenzene	4.7	43
Toluene	9.3	130
Xylenes	11	100
TPHg	180	210
TPHd	180	210
TPHmo	180	210
Acetone	0.50	1500
2-butanone (MEK)	13	14,000
T-butyl alcohol	110	18,000
Chloroethane	0.85	12
Methyl-t-butyl ether (MTBE)	8.4	1800
2 Methylnaphthalene	0.25	2.1
Naphthalene	2.8	24

1.8.1 Central UST Area

Field observations made during the subsurface explorations and analytical laboratory reports indicate that the fuel release originally reported for the former gasoline UST is larger than originally concluded. In addition, the 1986 data did not detect a diesel release associated with the former diesel USTs, however, the 2009 data indicates that soil and groundwater in the vicinity and downgradient of the former diesel/lube oil USTs has been impacted with petroleum hydrocarbon in the diesel and motor oil ranges. This finding explains the source of the elevated TPHd concentrations observed in MW-17 beginning with the 2004 groundwater monitoring event.

Borings B1 through B7 were advanced in the vicinity of the Central UST Area. As illustrated on Tables 1 and 2, constituents related to gasoline and diesel/motor oil exceed the ESLs in soil and groundwater. Shallower soil impacts at B1 and B2 probably reflect proximity to the original UST source areas. Plate 6 illustrates an approximate outline of the potential source area.

1.8.2 Western UST Area

Soil borings B8 through B41 were advanced to assess the Western UST Area and included offsite downgradient sampling locations. Tables 1 and 2 and Plates 4 and 5 indicate that groundwater in the area is impacted with petroleum hydrocarbons that exceed the ESLs. The highest concentrations of COCs are in the diesel range. The lack of BTEX constituents suggests that there are no gasoline releases in the Western UST Area High concentrations of gasoline range organics likely reflect the overlap of diesel components into the gasoline range of the chromatogram.

A review of Plate 3 indicates concentrations of diesel range petroleum hydrocarbons in soil above the water table. CKG considers impacted soil above 10 feet in depth to be potential source areas. Deeper soil samples probably reflect groundwater impacting soil in the capillary fringe.

Based on soil data and field observations, potential soil source areas may occur at the following locations:

- B23 and B24 - At the location of a former lube oil UST. Access to this area is very limited due to its location immediately adjacent to the glass plant, underneath the rail spur and between two smokestacks associated with the glass furnaces.

- B25, B26, B37 and B38 – In the vicinity of the former Maintenance Building and east of former fuel oil USTs. This area has impacted shallow soil which may be the result of historical surface releases.

- B12, B33 and B40 – The former location of two fuel oil USTs near the former Maintenance Building

- B8 – Adjacent to an alleged former waste oil tank. There or no records confirming that such a tank existed however shallow soil at B8 suggest a potential source in the vicinity.

Plate 6 illustrates approximate outlines of these potential source areas with the exception of impacts in the vicinity of B8. This particular location is difficult to pinpoint because the alleged waste oil tank is not located on site plans and it does not appear in site records. Also, this location is beneath a concrete ramp into the basement of the manufacturing building. The ramp itself may present a location where surface spills may have accumulated in the past and provided an opportunity to impact soil and groundwater below the ramp.

1.9 COMMUNITY PARTICIPATION

A public notification document has been prepared and included a discussion of the planned Targeted Excavations with ISCO program. ACDEH provided a mailing list and printed labels of interested stakeholders and local residents and businesses. The public notification document was mailed on October 12, 2010 and a 30-day comment period was allowed.

2.0 REMEDIAL ACTION OBJECTIVES AND CLEAN-UP GOALS

2.1 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are generally established that are protective of human health and the environment and reduce the potential for exposure to petroleum hydrocarbons in shallow soil encountered at the site. A single RAO has been selected for the site which is intended to address both short term and long term cleanup standards. The following statement is the RAO and proposed cleanup goal for the site:

> Removal or degradation of petroleum hydrocarbons in groundwater to achieve the agreed groundwater remediation goal, or an asymptotic minimum that stabilizes after the selected remediation effort has been implemented.

CKG suggests the following short term and long term cleanup goals unless the site conditions suggest that a stable asymptotic minimum has been achieved.

Groundwater Cleanup Standards

Constituent	Standard (µg/l)	Basis
Short-Term Cleanup Goals[a]		
TPH-diesel	2,500	ESL-Solubility
TPH-gasoline	5,000	ESL-Nuisance Odors
TPH-motor oil	2,500	ESL-Nuisance
Benzene	2000	ESL-Nuisance Odors
Xylenes	5,300	ESL-Nuisance Odors
Naphthalene	210	ESL-Nuisance Odors
Long-Term Cleanup Goals[a]		
TPH-diesel	210	Aquatic Habitat
TPH-gasoline	210	Aquatic Habitat
TPH-motor oil	210	Aquatic Habitat
Benzene	46	Aquatic Habitat
Xylenes	100	Aquatic Habitat
Naphthalene	24	Aquatic Protection

[a]Short-term goals are based on May 2008 Table I-2 ESLs for Gross Contamination Ceiling Levels for groundwater that is NOT a current or potential drinking water resource; long-terms goals are ESLs for based on Table F1-b groundwater that is NOT a current or potential drinking water resource.

3.0 PROPOSED FINAL REMEDY

3.1 CONCEPTUAL DESIGN

Based on the findings of CKG's FS dated August 27, 2010, the selected active remediation alternative includes targeted excavations at soil source areas following by an in-situ chemical oxidation injection program. The objectives of this work are as follows:

- The targeted excavations will remove shallow soil exceeding the short term cleanup goals
- The in-situ chemical oxidation program will reduce vadose zone and groundwater concentrations to the short term clean up goals

CKG proposes to complete four targeted excavations A through D as shown on Plate 6. Excavation A will encompass existing well MW-2 which will be properly destroyed prior to excavation. At the time the excavations are open CKG will try to recover impacted groundwater from the floor of the excavation. Because these are source areas these locations provide a unique opportunity to reduce the mass of petroleum hydrocarbons in groundwater relatively quickly. The success of this effort will be determined by the rate at which groundwater flows into the excavation. CKG will try to extract 1-3 excavation volumes from the excavation (assuming the excavation ends approximately one foot below first encountered groundwater).

When the excavations are backfilled CKG will place chemical oxidant mixed with gravel in the lower few feet of the excavation to facilitate ongoing biodegradation of petroleum hydrocarbons at the source areas. The rest of the excavation will be backfilled with compacted clean soil.

CKG will then follow the excavations with the in-situ chemical oxidation program. To facilitate the glass plant operations CKG may phase the excavations and areas of in-situ oxidation.

Following the active remediation CKG will continue monitoring the groundwater to evaluate the success of the active remediation. Each element of the final remedy is discussed in further detail below.

4.0 TARGETED EXCAVATIONS

4.1 PRELIMINARY WORK

4.1.1 Site Scheduling and Coordination

The Oakland plant is a 24-hour seven day a week operation that includes large numbers of trucks coming and going from the facility as well as personnel operating equipment or moving on foot at all times. Also, a number of existing structures such as the cullet bins, rail line, and existing diesel AST need to be removed/relocated to complete the excavations. All of these activities will require close coordination with the plant and are most likely to be staged one or two excavations at a time. CKG will prepare a scheduling document, once details have been resolved.

4.1.2 Proper Well Destruction and Replacement

Because MW-2 is located within or immediately adjacent to Excavation A it will be necessary to properly destroy it first.

CKG will obtain the necessary well destruction permits from the Alameda County Public Works Agency. CKG will coordinate with, an appropriately C-57 licensed contractor, to destroy the well by over drilling the entire well casing and sand pack. CKG will then grout to surface (or near surface) grade with 5% bentonite/cement slurry or bentonite grout slurry per Alameda County water well destruction requirements.

Well debris and soil generated during well closure will be stockpiled within the Excavation A area on plastic sheeting and will be covered with plastic sheeting. The soil and debris will be removed and properly disposed with the spoils created by Excavation A.

After the excavation is completed and backfilled, CKG will reinstall MW-2 at approximately the same location. It is probable that it will be within the former excavation which will provide a useful monitoring point to evaluate the effectiveness of the remedial action. The new well will be installed in accordance with Alameda County water well installation requirements.

4.1.3 Pre-Profile Excavation Soil for Disposal

CKG will coordinate with disposal facilities located near the Oakland plant. The data collected in 2009 should be adequate to profile the soil. If additional analyses are required, it will be possible to collect soil samples from the excavation area when MW-2 is destroyed. No excavation work will commence until an appropriate facility has accepted and profiled the waste.

4.1.4 Site Preparation

Each excavation area will require that existing structures be relocated as discussed in Section 4.1.1. In addition CKG will remove paving within the excavation work areas. If necessary, CKG will temporarily relocate any conflicting utilities. The work areas will then be secured with chain-link fencing and clear labeling with caution tape or equivalent. Temporary traffic control signage/barricades will be utilized to prevent vehicular traffic from entering the work areas.

4.2 EXCAVATION

4.2.1 Remove Impacted Soil

CKG will use an excavator to remove the soil within the approximate perimeter of the proposed excavation areas. Excavations will extend to an anticipated total depth of 10 to 12 feet below grade, depending on depth to water at the time the work is performed. Soil will be either directly loaded into trucks to be properly disposed at the selected facility, or it may be stockpiled temporarily then loaded to the trucks. If the soil is stockpiled it will be stored on plastic sheeting at a location acceptable to the property owner. CKG anticipates that soil will not be stockpiled for more that 24-48 hours. Stockpiling will only be necessary if there is a delay in scheduling trucks. The decision regarding direct loading or stockpiling will be dependent on the availability of trucks at the time the work is done. All soil transport will be performed by companies appropriately licensed to haul petroleum hydrocarbon impacted soil.

Although the perimeters of the excavations are outlined based on investigative data collected in 2009 and historically, it is possible that the boundaries of the excavations may be modified based on field observations such as visibly stained soil. To the extent practicable as much impacted soil as possible will be removed at each location recognizing that this effort may be limited by existing immovable structures or other obstacles. The following provides an estimated size, soil volume, and groundwater volume for each excavation:

Excavation	Area (ft^2)	Soil Volume ($yard^3$) Assuming 12 ft deep	Groundwater volume (gallons assuming 1 feet thick)
A	5000	2222	37,403
B	7000	3111	52,362
C	1000	444	7,481
D	2000	888	14,961

4.2.2 Confirmation Sampling

CKG will collect confirmation soil samples from the walls of the excavation, above the vadose zone. Samples will be collected at approximately 10 foot intervals around the perimeter of each excavation. Samples will be analyzed for total petroleum hydrocarbons quantified as gasoline and diesel by EPA Method 8015 as discussed in Section 3.1. One sample from each side of the excavation will also be analyzed for volatile organic constituents by EPA Method 8260 and semivolatile organics by EPA Method 8270.

4.2.3 Remove Groundwater

CKG anticipates pumping out approximately 1 to 3 excavation volumes of impacted groundwater at each excavation. Groundwater volumes for each excavation are tabulated above. The total volume of groundwater pumped will be determined by the rate of recharge and the logistics surrounding leaving the excavations open for a period of time.

Groundwater will be managed by placing it in the existing site oil/water separator. This system can handle a large volume of petroleum impacted water as long as it is not applied as a slug. If the water is particularly turbid it may be necessary to prefilter the water before it is discharged to the oil/water separator system.

4.2.4 Add ISCO, Backfill Excavation

The depth to groundwater at the facility varies from 8 to 14 feet below grade, with only a foot or two of seasonal variation over time. Assuming the excavations are extended one foot below the water the range of water elevation change can be expected to be up to two feet. CKG will backfill the bottom of the excavation with approximately three feet of gravel which will bring it up to the highest recorded historic water level. CKG also will mix a slurry of the oxygen releasing reagent, Oxygen Release Compound (ORC Advanced®) manufactured by Regenesis. ORC Advanced is a proprietary formulation of food grade calcium oxy-hydroxide that produces a controlled release of molecular oxygen to the subsurface for a period of up to 12 months. The ORC provides for enhanced bioremediation by releasing oxygen to the groundwater thus aiding microbial growth and enhancing conditions for microbial activity in order to accelerate natural attenuation processes.

After the gravel and ORC slurry is placed CKG will backfill and compact the excavation to grade using clean soil/fill material. The clean fill will be obtained from a local quarry which is quarrying native material. The quarry will provide documentation regarding the quality of the soil (including chemical analyses documenting that the soil is not impacted with petroleum hydrocarbons or other contaminants of concern and geotechnical properties of the soil including a compaction curve). Backfill will be compacted to approximately 90% and will be properly tested and documented by a geotechnical engineering firm.

4.2.5 Site Restoration

After the excavation backfill is completed CKG will remove debris and remove the fencing. The excavation footprint will be restored as necessary for Owens-Brockway to return the area to plant use.

5.0 CHEMICAL OXIDATION INJECTION

CKG will perform one initial round of ISCO reagent injections in the 6 injection areas as shown on Plate 6. The approximate sizes and total number of injection points (assuming 10 foot centers) for each injection area is tabulated below:

ISCO Injection Area	Dimensions	Number of Injection Points
1	140 x 190/2	133
2	160 x 120	192
3	160 x 190	304
4	90 x 25	22
5	80 x 120	96
6	210 x 20	42

Depending on the remediation schedule the injection areas may be completed at different times. CKG will request a permit from the Alameda County Health Department, for advancing the soil borings for injections. The drilling will be performed in accordance with State and County requirements. CKG also will obtain the proper encroachment permits from the City of Oakland to complete the injections in Areas 1 and 6. A site-specific health and safety plan (HASP) will be prepared as warranted to protect workers and the community during the ISCO injection implementation. CKG will document the field activities, monitor site data, and provide technical guidance to the contractor during the injection activities.

CKG's drilling subcontractor will use a direct-push drill rig to advance a 1½-inch-diameter stainless steel injection drill rod to the top of the targeted depth at each location. The rig will extract the injection rods to expose a 1-foot-long perforated injection tool, pump the desired quantity of reagent, close the injection tool, advance the injection rod one foot and repeat this process through the injection interval.

CKG has selected to use RegenOx manufactured by Regenesis. According to Regenesis, RegenOx is an advanced ISCO technology designed to treat organic chemicals. RegenOx is effective in treating TPH, PAHs (e.g., naphthalene), and chlorinated hydrocarbons. RegenOx reagent is a two part product (Part A is an oxidizer powder; Part B is a liquid activator). Part A is a mixture of sodium percarbonate [2Na2CO3- 3H2O2], sodium carbonate [Na2CO3], sodium silicate and silica gel, and Part B is a mixture of sodium silicate solution, silica gel and ferrous sulfate.

The exact concentrations of ISCO reagent to be injected are selected based on overall site conditions. Although it might be possible to calculate exactly how much petroleum hydrocarbon will be oxidized by a specific oxidant, in reality that is not the way the reaction occurs in the field. Soil and groundwater chemistry and pH, iron content and other chemical factors all take part in the very complex process. In addition it is not possible to calculate the effect of the secondary bioremediation enhancement that occurs. The following describes in general what occurs in the soil/groundwater when the ISCO reagent is added;

1 Oxidizing agent (Sodium percarbonate/calcium peroxide or whatever is selected) mixes with water to produce hydrogen peroxide.

2 Hydrogen peroxide is catalyzed to produce several oxygen radicals.

3 Oxygen radicals react with contaminants to form hydroxylated organics (alcohols/polyols/organic acids)

4 Hydroxylated organics are readily metabolized by intrinsic bacteria to carbon dioxide.

The manufacturers of the ISCO reagents have tested their products extensively in the field and have developed general rules of for application. In general when trying to reduce the contaminant mass apply as much as possible, however, field experience indicates that too much ISCO changes the water pH which causes other concerns. The exact quantity of ISCO injected is determined by the soil properties at the site and the volume that can be injected without creating chemical problems in the subsurface. Based on the ISCO contractor’s experience they have found that the optimal concentration is 18% ISCO by weight. At each injection point approximately 150 gallons of slurry will be injected with a pump at a target saturation of approximately 6 gallons per cubic yard. All drilling and sampling equipment will be properly decontaminated prior to use and between each location.

Actual treatment intervals and the quantity of oxidant injected at each injection point may be modified depending on site conditions. Upon completion of the injection process, grout will be used to seal the boreholes at each injection location.

It has been CKG's experience that the application of ISCO can have a surfactant effect on petroleum hydrocarbons sorbed to soil in the vadose zone and release them to collect as separate phase product on the groundwater surface. If this occurs it is an excellent opportunity to collect and remove it. CKG will measure depth to water and product thicknesses in monitoring wells within or downgradient of an ISCO injection area on a weekly basis for a minimum of four weeks. If sufficient free product begins to accumulate, CKG will have a technician visit the well approximately weekly to extract the product using a small submersible pump. The exact number of extraction events will be determined by the volume of free product that accumulates and its rate of recovery after an extraction event. This process will continue until the product thickness is too small to be extracted with a pump. A petroleum hydrocarbon absorbing sock will then be placed in the well.

ISCO injections will be repeated until the groundwater concentration reaches established short-term cleanup goals or asymptotic levels for a minimum of six months. If necessary this remediation approach may be modified depending on its effectiveness or site conditions encountered.

6.0 REMEDIAL ACTION COMPLETION

6.1 COMPLETION REPORT

When the targeted excavations and first round of ISCO are completed CKG will prepare a summary report. The following is a generalized outline of the report:

1.0 EXECUTIVE SUMMARY
2.0 INTRODUCTION
- 2.1 Site Description
- 2.2 Previous Work
- 2.3 Regulatory Status
- 2.4 Work Objectives

3.0 FIELD IMPLEMENTATION
- 3.1 Excavation Activities
- 3.2 Stabilization Activities
- 3.3 Soil and Groundwater Management
- 3.4 Site Restoration

4.0 CHEMICAL OXIDATION INJECTION
5.0 CONCLUSIONS
6.0 REFERENCES
7.0 LIMITATIONS

Tables and Plates summarizing analytical data, sample locations and excavation.

The above is not meant to be limiting and the content of the report will be modified as needed based on actual conditions encountered.

7.0 REMEDIATION EFFECTIVENESS MONITORING

CKG will continue with the existing groundwater monitoring program to evaluate the effectiveness of the remedial actions. Presently the groundwater monitoring is being performed annually but will be increased to semiannually after the first round of ISCO injections is completed. The first groundwater monitoring event after the excavation and ISCO have been completed will include analysis of chromium VI (Cr VI). Cr VI will be included annually to evaluate the potential that adding oxidant to the groundwater may oxidize indigenous chromium.

The results of the groundwater monitoring will be used to evaluate the need for additional rounds of ISCO. The results of the first round of ISCO will be documented in the first semiannual groundwater monitoring report completed after the ISCO is completed. Groundwater monitoring will continue until the residual contaminant concentrations achieve the long term clean-up goal or an asymptotic low.

8.0 REFERENCES

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9.0 LIMITATIONS

CKG Environmental, Inc. prepared this Corrective Action Plan in accordance with generally accepted standards of care, which exist in Northern California at this time. It should be recognized that definition and evaluation of geologic and environmental conditions is a difficult and an inexact science. Conclusions and recommendations presented in this report are based on the data provided in various reports contained in regulatory files.

Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present. More extensive studies, including additional subsurface investigations, may be performed to reduce uncertainties. If the client wishes to reduce the uncertainties of this investigation, CKG should be notified for additional consultation. No warranty, expressed or implied, is made.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both onsite and offsite) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify CKG of such intended use. Based on the intended use of the report, CKG may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release CKG from any liability resulting from the use of this report by any unauthorized party.

TABLES

Table 1. Soil Sample Analytical Results
Oakland, California

Sample ID	Sample Date	Depth ft bgs	TPHd	TPHmo	TPHg	BTEX				MTBE	SVOCs[11]	VOCs[12]
						Benzene	Toluene	Ethylbenzene	Xylenes			
CKG - B1 3.5-4[3]	8/31/2009	3.5-4	ND	ND	1.8	ND	ND	ND	ND	-	-	-
CKG - B1 8-8.5[3,4]	8/31/2009	1 8-8.5	**510**[5]	**180**[5]	**340**	ND<0.050	ND<0.050	0.057	0.55	-	ND<3.3 - ND<16[1]	0.053-0.54[1]
CKG - B2 5-5.5[3]	8/31/2009	5-5.5	**710**[5]	**190**[5]	66	ND	ND	ND	0.039	-	-	-
CKG - B2 12-12.5[3]	8/31/2009	12-12.5	150[6,8]	98[6,8]	50	ND<0.010	ND<0.010	ND<0.10	ND<0.10	-	-	-
CKG - B3 12.5-13	8/31/2009	12.5-13	ND	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B4 9-9.5	8/31/2009	9-9.5	19[6,8]	59[6,8]	ND	ND	ND	ND	ND	-	-	-
CKG - B5 11.5-12[3,4]	8/31/2009	11.5-12	63[5]	18[5]	24	ND	0.013	0.07	0.064	-	-	-
CKG - B6 5-5.5	8/31/2009	5-5.5	ND	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B6 7.5-8	8/31/2009	7.5-8	ND	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B7 7.5-8	8/31/2009	7.5-8	9.9[7]	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B7 12-12.5[3]	8/31/2009	12-12.5	ND	ND	6.3	ND	ND	ND	ND	-	-	-
CKG - B8 7.5-8[3,4]	9/1/2009	7.5-8	**1,800**[5,8]	**390**[5,8]	**2,000**	ND<0.25	0.51	2.4	10	-	-	-
CKG - B8 13-13.5[3,4]	9/1/2009	13-13.5	**580**[5,8]	170[5,8]	**840**	ND<0.25	ND<0.25	**4.3**	2.9	-	-	-
CKG - B9 4-4.5[3,4]	9/1/2009	4-4.5	140[6,8,9]	**200**[6,8,9]	140	ND<0.050	ND<0.050	0.26	0.18	-	-	-
CKG - B9 14-14.5[2,3]	9/1/2009	14-14.5	**760**[5,8]	**190**[5,8]	870	ND<1.0	ND<1.0	ND<1.0	ND<1.0	-	-	-
CKG - B11 11-11.5	9/1/2009	11-11.5	ND	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B11 13.5-14[3]	9/1/2009	13.5-14	**800**[5,8]	**360**[5,8]	**280**	ND<0.25	ND<0.25	ND<0.25	ND<0.25	-	-	-
CKG - B12 3.5-4[3,4]	9/1/2009	3.5-4	**7,500**	**3,600**	**2,400**	ND<1.0	ND<1.0	**4.9**	**11**	-	-	-
CKG - B12 13.5-14[3,4]	9/1/2009	13.5-14	**220**[5,8]	87[5,8]	**490**	ND<0.25	ND<0.25	0.5	1.2	-	ND<0.66-0.8	ND<0.008 - ND<0.2[1]
CKG - B13 10-10.5	9/1/2009	10-10.5	8.5[6,8]	14[6,8]	ND	ND	ND	ND	ND	-	-	-
CKG - B14 10-10.5[3,4]	9/1/2009	10-10.5	**3,100**[6,8,9]	**3,200**[6,8,9]	**890**	ND<0.25	1.1	2.5	5.5	-	-	-
CKG - B14 15-15.5[3,4]	9/1/2009	15-15.5	**290**[6,8]	**260**[6,8]	**420**	ND<0.010	0.25	0.62	1.1	-	-	-
CKG - B15 4-4.5	9/1/2009	4-4.5	2.8[6,9]	ND	ND	ND	ND	ND	ND	-	-	-
CKG - B15 9-9.5[3,4]	9/1/2009	9-9.5	**430**[5,8]	140[5,8]	**400**	ND<0.10	ND<0.10	0.51	1.5	-	-	-
CKG - B16 4-4.5[3,4]	9/1/2009	4-4.5	4.8[6,8,9]	7.7[6,8,9]	-	ND	ND	0.013	0.074	-	-	-
CKG - B16 9.5-10[3,4]	9/1/2009	9.5-10	**7,900**	**5,300**	-	ND<1.0	7.5	**11**	**36**	-	-	-
CKG - B17 4-4.5[3]	9/1/2009	4-4.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B17 9.5-10[3]	9/1/2009	9.5-10	**1,000**[5,8]	**270**[5,8]	-	ND<0.10	ND<0.10	2	4.4	-	-	-
CKG - B19 4-4.5[3]	9/2/2009	4-4.5	20[6,8]	92[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B19 10-10.5[3]	9/2/2009	10-10.5	**680**[5,8]	**320**[5,8]	-	ND<0.10	ND<0.10	0.14	0.17	-	-	-
CKG - B20 3.5-4	9/2/2009	3.5-4	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B20 13-13.5[3,4]	9/2/2009	13-13.5	38[6,8]	31[6,8]	-	ND	ND	0.02	ND	-	-	-
CKG - B21 5.5-6	9/2/2009	5.5-6	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B21 12.5-13	9/2/2009	12.5-13	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B22 7.5-8	9/2/2009	7.5-8	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B22 12-12.5	9/2/2009	12-12.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B23 8-8.5[3]	9/2/2009	8-8.5	**940**[6,8]	**970**[6,8]	-	ND<0.050	ND<0.050	ND<0.050	ND<0.050	-	-	-
CKG - B23 12.5-13[3]	9/2/2009	12.5-13	23[6,8]	33[6,8]	-	ND	ND	ND	ND	-	-	ND<0.005-0.082
CKG - B24 4-4.5[3,4]	9/2/2009	4-4.5	**420**[6,8]	**860**[6,8]	-	0.012	ND	0.096	0.18	-	-	-
CKG - B24 11.5-12[3]	9/2/2009	11.5-12	15[6,8]	28[6,8]	-	ND	ND	ND	ND	-	ND<0.33-ND<1.6	-
CKG - B25 3.5-4	9/2/2009	3.5-4	130[6,8]	**340**[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B25 7.5-8[3]	9/2/2009	7.5-8	**1,700**[6,8]	**1,800**[6,8]	-	**0.36**	ND<0.25	ND<0.25	ND<0.25	-	-	-
CKG - B26 7.5-8[3]	9/2/2009	7.5-8	8.9[6,8]	28[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B26 14.5-15[3]	9/2/2009	14.5-15	**1,200**[6,8]	**1,200**[6,8]	-	ND<0.10	ND<0.10	0.34	0.98	-	-	0.021-0.054
CKG - B27 5.5-6	9/3/2009	5.5-6	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B27 8.5-9	9/3/2009	8.5-9	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B28 8.5-9	9/3/2009	8.5-9	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B28 12.5-13	9/3/2009	12.5-13	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B29 4-4.5	9/3/2009	4-4.5	2.5[6,8,10]	9.7[6,8,10]	-	ND	ND	ND	ND	-	-	-
CKG - B29 12-12.5	9/3/2009	12-12.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B30 8-8.5	9/3/2009	8-8.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B30 14-14.5	9/3/2009	14-14.5	1.5[6]	ND	-	ND	ND	ND	ND	-	-	-
CKG - B31 8-8.5	9/3/2009	8-8.5	14[6,8]	**100**[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B31 13-13.5	9/3/2009	13-13.5	4.6[6,8]	9.9[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B32 7-7.5	9/3/2009	7-7.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B32 14-14.5[3]	9/3/2009	14-14.5	**230**[5,8]	67[5,8]	-	ND<0.50	ND<0.50	ND<0.50	ND<0.50	-	-	ND<0.016-ND<0.4[1]
CKG - B33 5-5.5[3]	9/3/2009	5-5.5	**2,300**[5,8]	**890**[5,8]	-	ND<1.0	ND<1.0	**2.3**	7	-	-	-
CKG - B33 10-10.5[3,4]	9/3/2009	10-10.5	**980**[5,8]	**380**[5,8]	-	ND<1.0	1.7	1.2	2.8	-	-	-
CKG - B34 5.5-6[3]	9/3/2009	5.5-6	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B34 12-12.5	9/3/2009	12-12.5	2.1[6,8]	10[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B35 4-4.5	9/3/2009	4-4.5	9.1[6,8]	85[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B35 9.5-10	9/3/2009	9.5-10	1.2[6]	ND	-	ND	ND	ND	ND	-	-	-
CKG - B36 4-4.5	9/4/2009	4-4.5	ND	ND	-	ND	ND	ND	ND	-	-	-
CKG - B36 9-9.5	9/4/2009	9-9.5	72[6,8]	**210**[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B37 4-4.5[3]	9/4/2009	4-4.5	7.7[6,8]	36[6,8]	-	ND	ND	0.0081	0.029	-	-	-
CKG - B37 16.5-17[3,4]	9/4/2009	16.5-17	**4,100**[6,8,10]	**3,100**[6,8,10]	-	ND<1.0	ND<1.0	**5.7**	6.7	-	-	-
CKG - B38 7.5-8[3]	9/4/2009	7.5-8	**590**[5,8]	**240**[5,8]	-	ND<0.050	ND<0.050	ND<0.0050	0.56	-	-	-
CKG - B38 15-15.5[3]	9/4/2009	15-15.5	66[5,8]	26[5,8]	-	ND	ND	0.0094	0.12	-	-	-
CKG - B39 8-8.5[3]	9/4/2009	8-8.5	14[6,8]	39[6,8]	-	ND	ND	ND	ND	-	-	-
CKG - B39 15.5-16[3]	9/4/2009	15.5-16	**480**[5,8]	90[5,8]	-	ND<0.10	ND<0.10	ND<0.10	0.63	-	-	-
CKG - B40 9-9.5[3,4]	9/4/2009	9-9.5	**3,800**[5,8]	**1,100**[5,8]	-	ND<0.25	ND<0.25	ND<0.25	10	-	-	-
CKG - B40 15.5-16[3]	9/4/2009	15.5-16	**190**[5,8]	76[5,8]	-	ND<0.050	ND<0.050	0.073	4.6	-	-	-
CKG - B41 8-8.5[3]	9/4/2009	8-8.5	12[6,8,9]	28[6,8,9]	-	ND	ND	ND	ND	-	-	-
CKG - B41 16.517[3,4]	9/4/2009	16.5-17	24[5,8]	11[5,8]	-	ND	ND	0.035	0.072	-	-	-
ESL Standard B-2			**180**	**180**	**180**	**0.27**	**9.3**	**4.7**	**11**	**8.4**	-	-

Notes: All results in mg/kg
ESL Standard B-2 - Shallow Soil Screening Levels, Commercial/Industrial Land Use (groundwater is not a current or potential drinking water resource).

1 Sample diluted due to high organic content
2 Estimated value due to low surrogate recovery, caused by matrix interface
3 Strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram
4 No recognizable pattern
5 Unmodified or weakly modified diesel is significant; and/or kerosene/kerosene range/jet fuel range
6 Diesel range compounds are significant; no recognizable pattern
7 Aged diesel is significant
8 Oil range compounds are significant
9 Stoddard solvent/mineral spirit (?)
10 Gasoline range compounds are significant
11 See table 1A below
12 See table 1B below

Table 1A. Soil Sample Analytical Results - SVOCs
Oakland, California

Sample ID:	CKG - B1 8-8.5[1]	CKG - B12 13.5-14	CKG - B24 11.5-12	ESL Standard B-2
SVOCs				
2-Methylnapthalene	ND<3.3	**0.8**	ND	**0.25**
All Other SVOCs	ND<3.3 - ND<16	ND<0.66-ND<3.2	ND<0.33-ND<1.6	-

Note: All results in mg/kg
Standard B-2 - Shallow Soil Screening Levels, Commercial/Industrial Land Use (groundwater is not a current or potential drinking water resource).

1 Sample diluted due to high organic content

Table 1B. Soil Sample Analytical Results - VOCs
Oakland, California

Sample ID:	CKG - B1 8-8.5[1]	CKG - B12 13.5-14[1]	CKG - B23 12.5-13	CKG - B26 14.5-15	CKG - B32 14-14.5[1]	ESL Standard B-2
VOCs						
Acetone	ND<0.2	ND<0.1	0.082	ND<0.2	ND<0.2	**0.50**
n-Butyl benzene	0.54	ND<0.01	ND	0.038	ND<0.02	-
1,2,4 - Trimethylbenzene	ND<0.02	ND<0.01	ND	0.052	ND<0.02	-
sec Butyl Benzene	0.20	ND<0.01	ND	0.054	ND<0.02	-
Ethylbenzene	ND<0.02	ND<0.01	ND	0.021	ND<0.02	**4.7**
Isopropylbenzene	0.068	ND<0.01	ND	0.035	ND<0.02	-
n-Propyl benzene	0.053	ND<0.01	ND	0.032	ND<0.02	-
1,2,3 - Trichloropropane	ND<0.02	ND<0.01	ND	0.024	ND<0.02	-
1,3,5 - Trimethylbenzene	ND<0.02	- ND<0.01	ND	0.052	ND<0.02	-
All Other VOCs	ND<0.016 - ND<0.2	ND<0.008 - ND<0.2	ND<0.005-ND<0.1	ND<0.016-ND<0.4	ND<0.016 - ND<0.4	-

Note: All results in mg/kg
ESL Standard B-2 - Shallow Soil Screening Levels, Commercial/Industrial Land Use (groundwater is not a current or potential drinking water resource).

1 Sample diluted due to high organic content

Table 2. Groundwater Sample Analytical Results
Oakland, California

Sample ID	Sample Date	TPHd	TPHmo	TPHg	BTEX				MTBE	SVOCs[14]	VOCs[15]
					Benzene	Toluene	Ethylbenzene	Xylenes			
CKG - B1[2,3,3]	8/31/2009	**220,000**[2,3,7,8,10]	**53,000**[2,3,7,8,10]	**17,000**	**720**	ND<25	**400**	**340**	-	-	22-710[2,3]
CKG - B2[2,3,5]	8/31/2009	**720,000**[2,3,4,9]	**630,000**[2,3,6,9]	**15,000**	ND<10	ND<10	ND<10	ND<10	-	-	-
CKG - B3[2]	8/31/2009	**270**[2,6,9]	**310**[2,6,9]	ND	ND	ND	ND	ND	-	-	-
CKG - B4[2]	8/31/2009	**410**[2,6,9]	**520**[2,6,9]	ND	ND	ND	ND	ND	-	-	-
CKG - B5[2,6]	8/31/2009	**1,200**[2,6,9]	**850**[2,6,9]	240	ND	1.6	ND	ND	-	-	-
CKG - B6[2]	8/31/2009	**3,900**[2,6,9]	**3,400**[2,6,9]	ND	ND	ND	ND	ND	-	-	-
CKG - B8[2,3,5,6]	9/1/2009	**170,000**[2,3,7,9]	**62,000**[2,3,7,9]	-	ND<10	ND<10	17	ND<10	-	-	-
CKG - B9[2,3,5,6]	9/1/2009	**330,000**[2,3,4,7,9]	**120,000**[2,3,4,7,9]	**23,000**	ND<10	ND<10	**46**	**200**	-	-	-
CKG - B11[2,5]	9/1/2009	**3,100**[2,6,9]	**6,300**[2,6,9]	-	ND	ND	ND	ND	-	-	-
CKG - B12[2,3,5]	9/1/2009	**150,000**[2,3,4,7,9]	**100,000**[2,3,4,7,9]	-	ND<2.5	ND<2.5	3.8	10	-	-	1.4-13[2,3]
CKG - B13[2]	9/1/2009	**3,200**[2,6,9]	**10,000**[2,6,9]	-	ND	ND	ND	ND	-	-	-
CKG - B14[2,3,6,7]	9/1/2009	**82,000**[2,6,9]	**81,000**[2,6,9]	**1,400**	ND<1.0	2.2	14	4.6	-	-	-
CKG - B15[2,3,5]	9/1/2009	**34,000**[2,3,4,9]	**19,000**[2,3,4,9]	-	ND<2.5	ND<5.0	ND<5.0	ND<5.0	-	-	-
CKG - B16[2,3,6,7]	9/1/2009	**680,000**[2,6,9,11]	**490,000**[2,6,9,11]	**11,000**	ND<1.0	10	26	63	-	-	-
CKG - B17[2,3,6,7]	9/1/2009	**19,000**[2,3,4/7,9]	**9,300**[2,3,4/7,9]	**1,400**	ND<1.7	ND<1.7	ND<1.7	ND<1.7	-	-	-
CKG - B19[2,3,6,7]	9/2/2009	**1,300,000**[2,6,9,11]	**860,000**[2,6,9,11]	**19,000**	ND<10	12	39	14	-	-	-
CKG - B20[2,3,7]	9/2/2009	**1,100,000**[2,6,9]	**900,000**[2,6,9]	**4,300**	ND<10	ND<10	ND<10	ND<10	-	-	4.3-27[1,2,3]
CKG - B21[2]	9/2/2009	**310**[2,6,9]	**330**[2,6,9]	ND	ND	ND	ND	ND	-	-	-
CKG - B22[2,3,7]	9/2/2009	**70,000**[2,3,6,9]	**60,000**[2,3,6,9]	110	ND	ND	ND	ND	-	-	-
CKG - B23[2,3,6,7]	9/2/2009	**140,000**[2,6,9,11]	**590,000**[2,6,9,11]	**7,500**	ND	2.6	5.1	39	-	-	-
CKG - B24[2]	9/2/2009	**3,900**[2,8,9]	**4,300**[2,8,9]	ND	ND	ND	ND	ND	-	-	-
CKG - B25[2,3,7]	9/2/2009	**34,000**[2,6,9]	**57,000**[2,8,9]	**270**	ND	ND	N D	2.5	-	-	-
CKG - B26[2,3,6,7]	9/2/2009	**4,700,000**[2,3,6,9]	**4,700,000**[2,3,6,9]	**5,500**	ND<2.05	2.6	4.7	42	-	-	6.1-70[1,2,3]
CKG - B27[2,3,7]	9/3/2009	**3,200**[2,4/7,9]	**1,500**[2,4/7,9]	**250**	ND	ND	ND	2.3	-	-	-
CKG - B28[2,3,6,7]	9/3/2009	**770,000**[2,4/7,9]	**230,000**[2,4/7,9]	**8,000**	ND<1.7	ND<1.7	9.5	35	-	-	-
CKG - B29[2,3,7]	9/3/2009	**120,000**[2,4/7,9]	**55,000**[2,4/7,9]	**1,700**	ND<5.0	ND<5.0	ND<5.0	ND<5.0	-	-	-
CKG - B30[2,3,7]	9/3/2009	**29,000**[2,6,9]	**36,000**[2,6,9]	120	ND	1.1	ND	0.8	-	-	-
CKG - B31[2,3,7]	9/3/2009	**260,000**[2,4/7,9]	**150,000**[2,4/7,9]	**2,100**	ND<5.0	ND<5.0	ND<5.0	ND<5.0	-	-	2.8-72[1,2]
CKG - B32[2,3,7]	9/3/2009	**1,700,000**[2,4/7,9]	**820,000**[2,4/7,9]	**18,000**	ND<1.7	ND<1.7	13	78	-	-	-
CKG - B33[2,3,5,6]	9/3/2009	**1,500,000**[2,3,4/7,9]	**1,100,000**[2,3,4/7,9]	-	ND<1.7	8	19	50	-	-	-
CKG - B34[5,6]	9/3/2009	**1,000**[2,6,9]	**2,800**[2,6,9]	-	ND	ND	ND	ND	-	-	-
CKG - B35[2]	9/3/2009	**450**[2,6,9]	**1,200**[2,6,9]	-	ND	ND	ND	ND	-	-	-
CKG - B36[2,3,5,6]	9/4/2009	**310,000**[2,3,6,9,11]	**250,000**[2,3,6,9,11]	-	ND	1.9	2.7	16	-	-	-
CKG - B37[2,3,5,6]	9/4/2009	**460,000**[2,3,6,9,11]	**550,000**[2,3,6,9,11]	-	ND	2.6	6.5	34	-	-	-
CKG - B38[2,3,5,6]	9/4/2009	**620,000**[2,3,4/7,9]	**300,000**[2,3,4/7,9]	-	ND	3.4	4.7	20	-	-	-
CKG - B39[2,3,5]	9/4/2009	**180,000**[2,3,4/7,9]	**64,000**[2,3,4/7,9]	-	ND	ND	5.1	ND	-	ND<1,000-ND<5,000[1,2]	-
CKG - B40[2,3,5,6]	9/4/2009	**350,000**[2,3,4/7,9]	**150,000**[2,3,4/7,9]	-	ND<2.5	2.6	**47**	**200**	-	-	-
CKG - B41[2,3,5,6]	9/4/2009	**150,000**[2,3,4/7,9]	**87,000**[2,3,4/7,9]	-	ND<10	ND<10	ND<10	ND<10	-	-	-
MW-1[2, 9, 12]	10/16/2009	**310**	**310**	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-5[2, 3, 2, 9, 12]	10/16/2009	**160,000**	**140,000**	180	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-6[3, 2, 12, 13]	10/16/2009	**98,000**	**89,000**	**490**	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-7[3, 34, 5, 9]	10/16/2009	**60,000**	**35,000**	**2,200**	ND<5.0	ND<5.0	ND<5.0	ND<5.0	-	-	-
MW-8[2, 6, 11, 12]	10/16/2009	**340**	ND<250	**280**	ND<0.5	ND<0.5	ND<0.5	1.4	-	-	-
MW-10[2 5, 9, 12]	10/16/2009	**4,700**	**4,600**	110	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-13[2]	10/16/2009	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-15[2, 12]	10/16/2009	55	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-16[9, 12, 13]	10/16/2009	**780**	**910**	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-17[2, 3, 4, 5, 6]	10/16/2009	**900,000**	**350,000**	**2,400**	ND<1.0	2.9	ND<1.0	ND<1.0	-	-	-
MW-19[5, 11, 12]	10/16/2009	**440**	ND<250	**390**	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	-
MW-20	10/16/2009	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	-	
ESL Standard F-1b		**210**	**210**	**210**	**46**	**130**	**43**	**100**	**1,800**	-	-

Note: All results in µg/l
ESL Standard F-1b - Groundwater Screening Levels (groundwater is not a current or potential drinking water resource).

1 Sample diluted due to high organic content
2 Aqueous sample that contains greater than ~1 vol. % sediment
3 Lighter than water immiscible sheen/product is present
4 Weakly modified or unmodified gasoline is significant
5 Strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram
6 No recognizable pattern
7 Kerosene/kerosene range/jet fuel range
8 Aged diesel is significant
9 Oil range compounds are significant
10 Stoddard solvent/mineral spirit (?)
11 Gasoline range compounds are significant
12 Diesel range compounds are significant; no recognizable pattern
13 One to few isolated peaks present in the TPH (d/mo) chromatogram
14 See table 2A below
15 See table 2B below

Table 2A. Groundwater Sample Analytical Results - SVOCs
Oakland, California

Sample ID:	CKG - B39[1,2]
SVOCs	
All Other SVOCs	ND<1,000-ND<5,0000

Note: All results in µg/l

1 Sample diluted due to high organic content
2 Aqueous sample that contains greater than ~1 vol. % sediment

Table 2B. Groundwater Sample Analytical Results - VOCs
Oakland, California

Sample ID:	CKG - B1[2, 3]	CKG - B12[2,3]	CKG - B20[1,2,3]	CKG - B26[1,2,3]	CKG - B32[1,2]	ESL Standard F-1b
VOCs						
Acetone	ND<330	13	27	70	72	**1,500**
Benzene	**710**	ND	ND<1.0	ND<1.0	ND<2.5	**46**
2-Butanone(MEK)	ND<67	ND	4.3	15	17	**14,000**
n-Butyl benzene	100	6.1	ND<1.0	11	10	-
tert-Butyl benzene	ND<17	1.4	ND<1.0	ND<1.0	ND<2.5	-
Chloroethane	ND<17	ND	ND<1.0	ND<1.0	2.8	**12**
4-Isopropyl toluene	ND<17	3.9	ND<1.0	9	ND<2.5	-
Naphthalene	**190**	ND	ND<1.0	ND<1.0	ND<2.5	**24**
1,2,4 - Trimethylbenzene	92	ND	ND<1.0	14	ND<2.5	-
t-Butyl alcohol (TBA)	ND<67	ND	5.3	44	ND<10	**18,000**
sec Butyl Benzene	22	8.7	ND<1.0	6.1	15	-
Ethylbenzene	**360**	ND	ND<1.0	ND<1.0	ND<2.5	**43**
Isopropylbenzene	91	2.3	ND<1.0	15	ND<2.5	-
Methyl-t-butyl ether (MTBE)	320	ND	ND<1.0	ND<1.0	ND<2.5	**1,800**
n-Propyl benzene	220	ND	ND<1.0	16	ND<2.5	-
1,2,3 - Trichloropropane	ND<17	ND	ND<1.0	ND<1.0	ND<2.5	-
1,3,5 - Trimethylbenzene	190	ND	ND<1.0	6.3	ND<2.5	-
Xylenes	**320**	ND	ND<1.0	24	ND<2.5	**100**
All Other VOCs	ND<17-ND<330	ND<0.2-ND<10	ND<0.4-ND<20	ND<0.4-ND<20	ND<1.0-ND<50	-

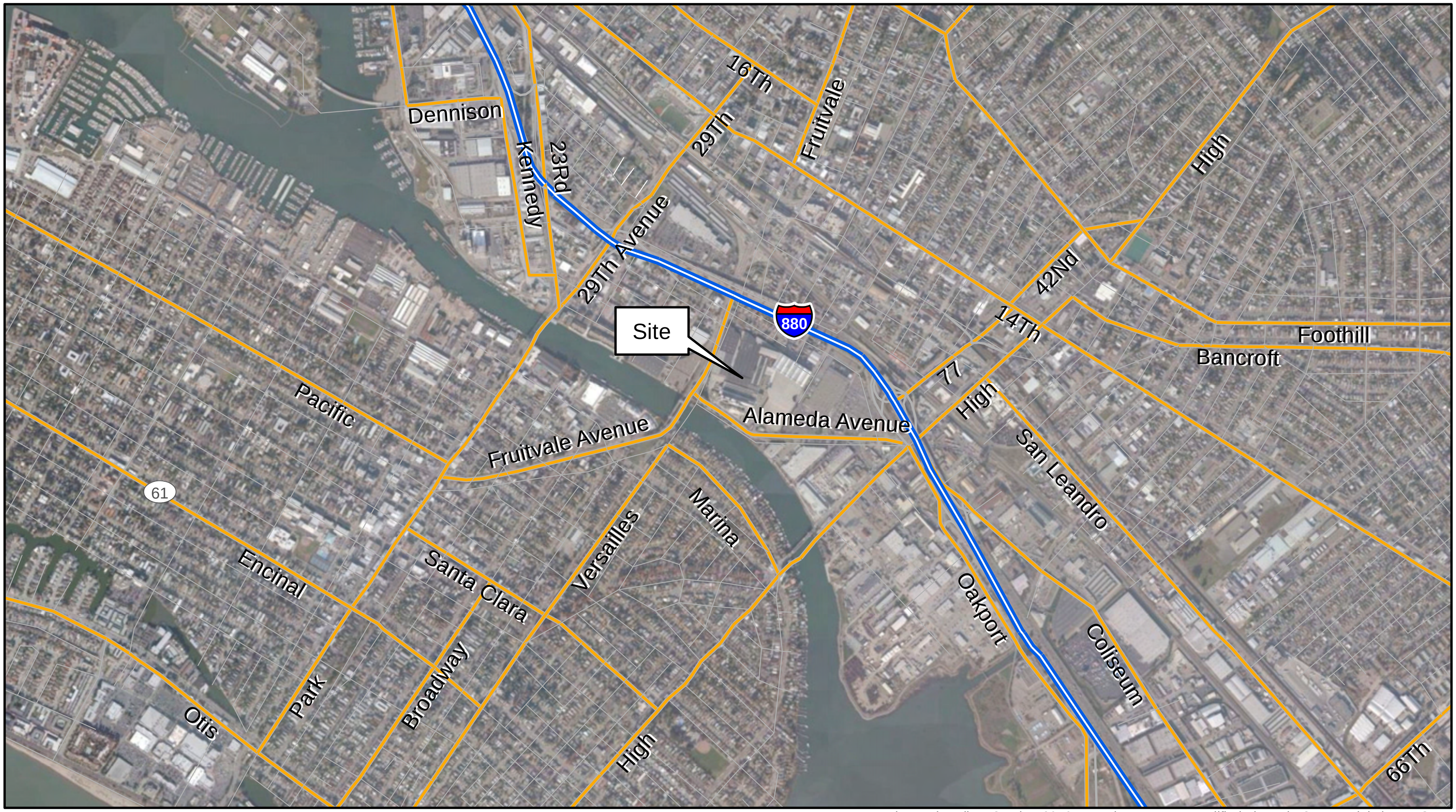
Note: All results in µg/l
ESL Standard F-1b - Groundwater Screening Levels (groundwater is not a current or potential drinking water resource).

1 Sample diluted due to high organic content
2 Aqueous sample that contains greater than ~1 vol. % sediment
3 Lighter than water immiscible sheen/product is present

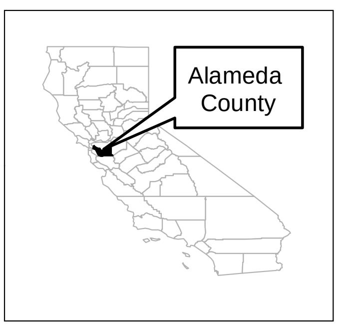
NOTES (Tables 1-2):

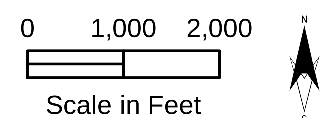
TPHg: Total petroleum hydrocarbons as gasoline; analyzed by Method SW8021B/8015Bm
TPHd: Total petroleum hydrocarbons as diesel w/silica gel cleanup; analyzed by Method SW8015B
TPHmo: Total petroleum hydrocarbons as motor oil w/silica gel cleanup; analyzed by Method SW8015B
SVOCs: Semi-Volatile Organic Compounds; analyzed by Method SW8720C
VOCs: Volatile Organic Compounds; analyzed by Method SW8260B
MTBE: Methyl-t-butyl-ether; analyzed by Method SW8021B/8015Bm
mg/kg: Milligrams per kilogram
µg/l: Micrograms per liter
ND: Not detected above the respective reporting limit
- : Not Analyzed

PLATES



Drawn by A. Llewellyn. October 2010. Base layers are unmodified Alameda County Digital Data Sets.

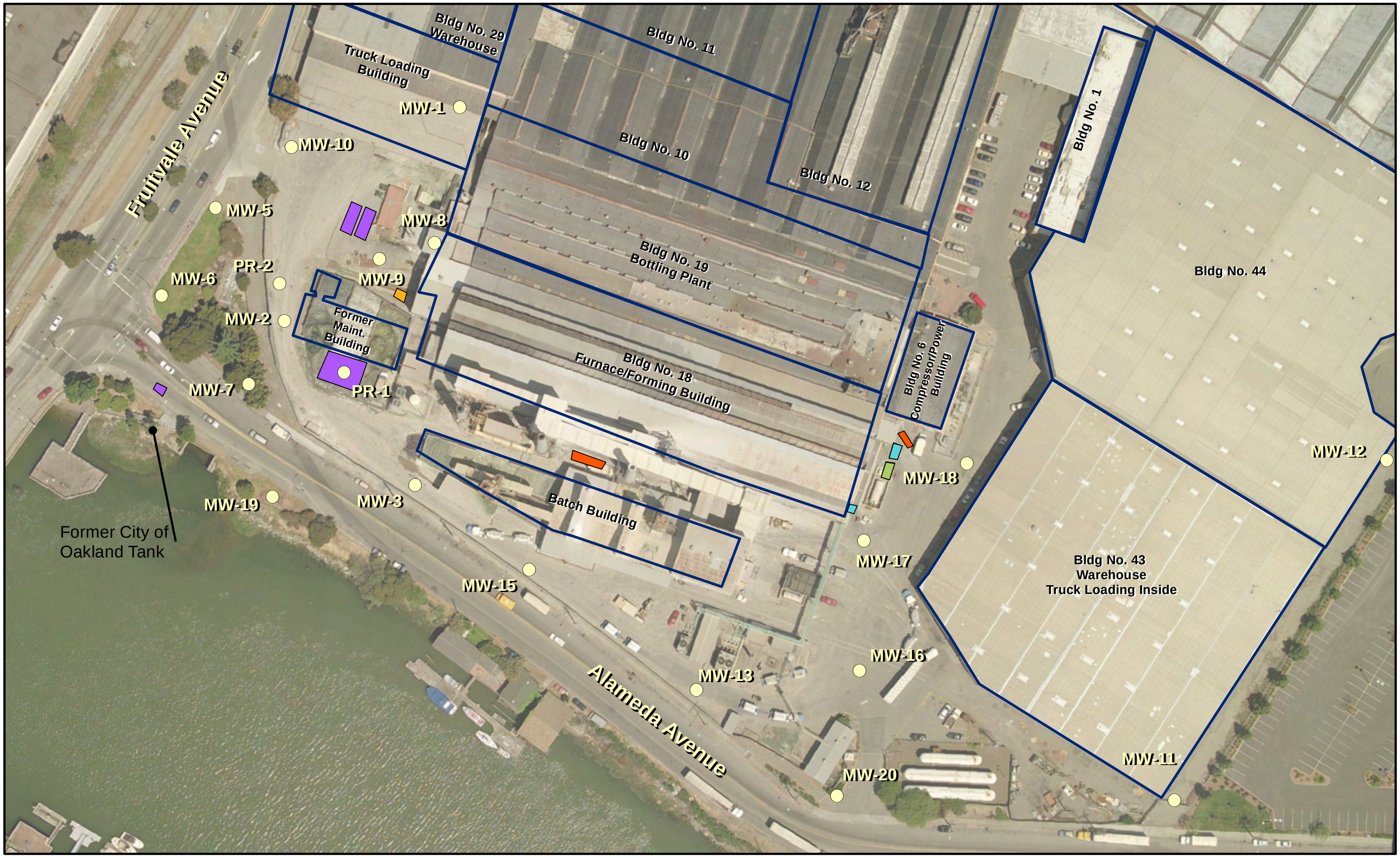




CKG Environmental, Inc.

Site Location Map
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland, California

PLATE
1



Drawn by A. Llewellyn. October 2010. Base layers are unmodified Pictometry Digital Data Sets.

0 75 150

Scale in Feet

N

S

EXPLANATION

Monitoring Well

Building

Former Underground Fuel Storage Tanks

Diesel

Fuel Oil

Gasoline

Lube Oil

Waste Oil

CKG Environmental, Inc.

Site Features Map

Owens-Brockway Glass Container Facility

3600 Alameda Avenue, Oakland California

PLATE

2

Drawn by A. Llewellyn. October 2010. Base layers are unmodified Pictometry Digital Data Sets.

EXPLANATION

710 TPHd Concentration from Geoprobe in mg/kg

● Geoprobe Location

○ Monitoring Well

- - - - Sausal Creek Storm Sewer

0 50 100

Scale in Feet

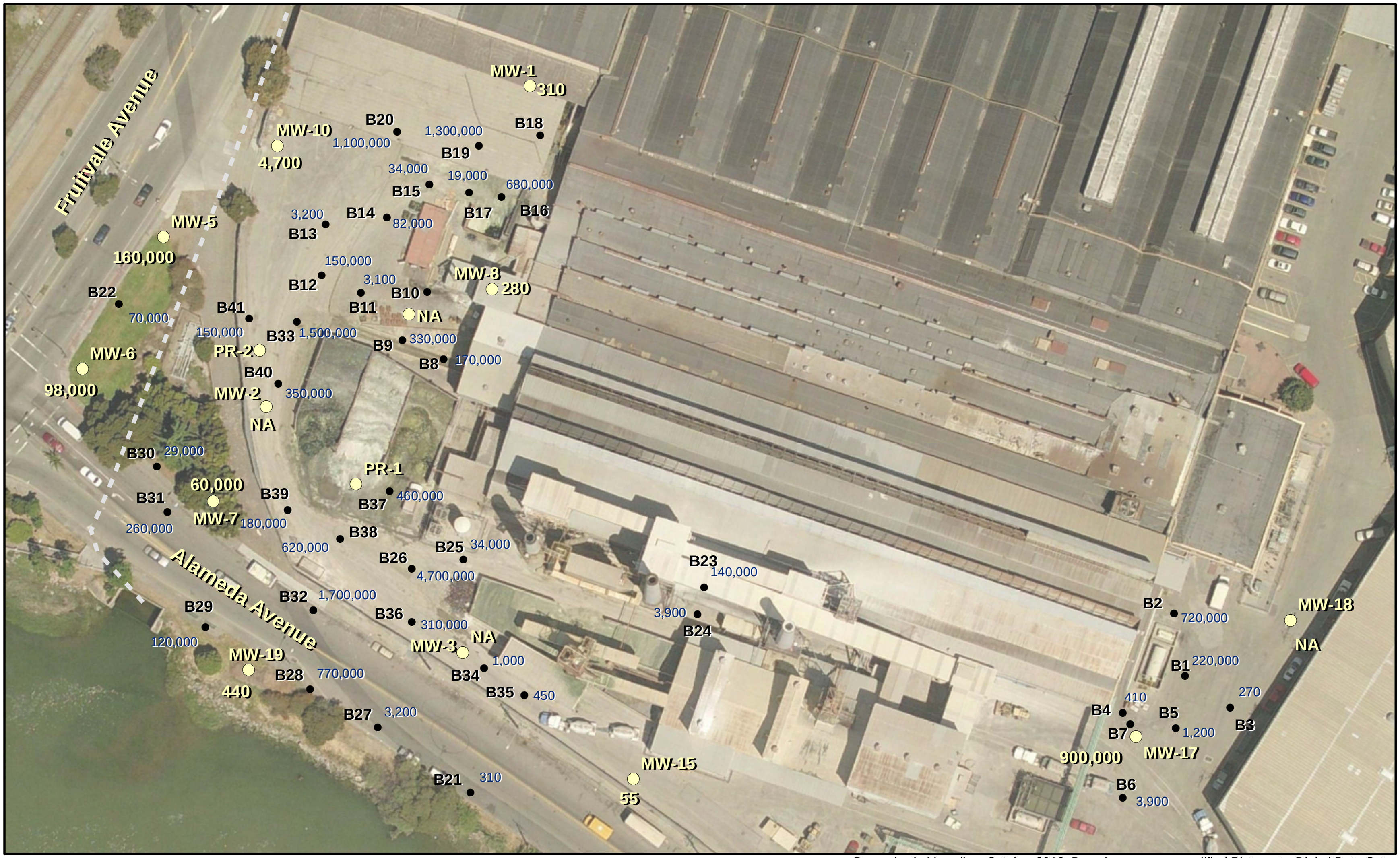
N

S

CKG Environmental, Inc.

TPHd in Soil Distribution Map
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE
3



Drawn by A. Llewellyn. October 2010. Base layers are unmodified Pictometry Digital Data Sets.

0 50 100

Scale in Feet

N

S

EXPLANATION

310 TPHd Concentration from Geoprobe Sample in µg/l

Geoprobe Location

310 TPHd Concentration from Monitoring Well Sample in µg/l

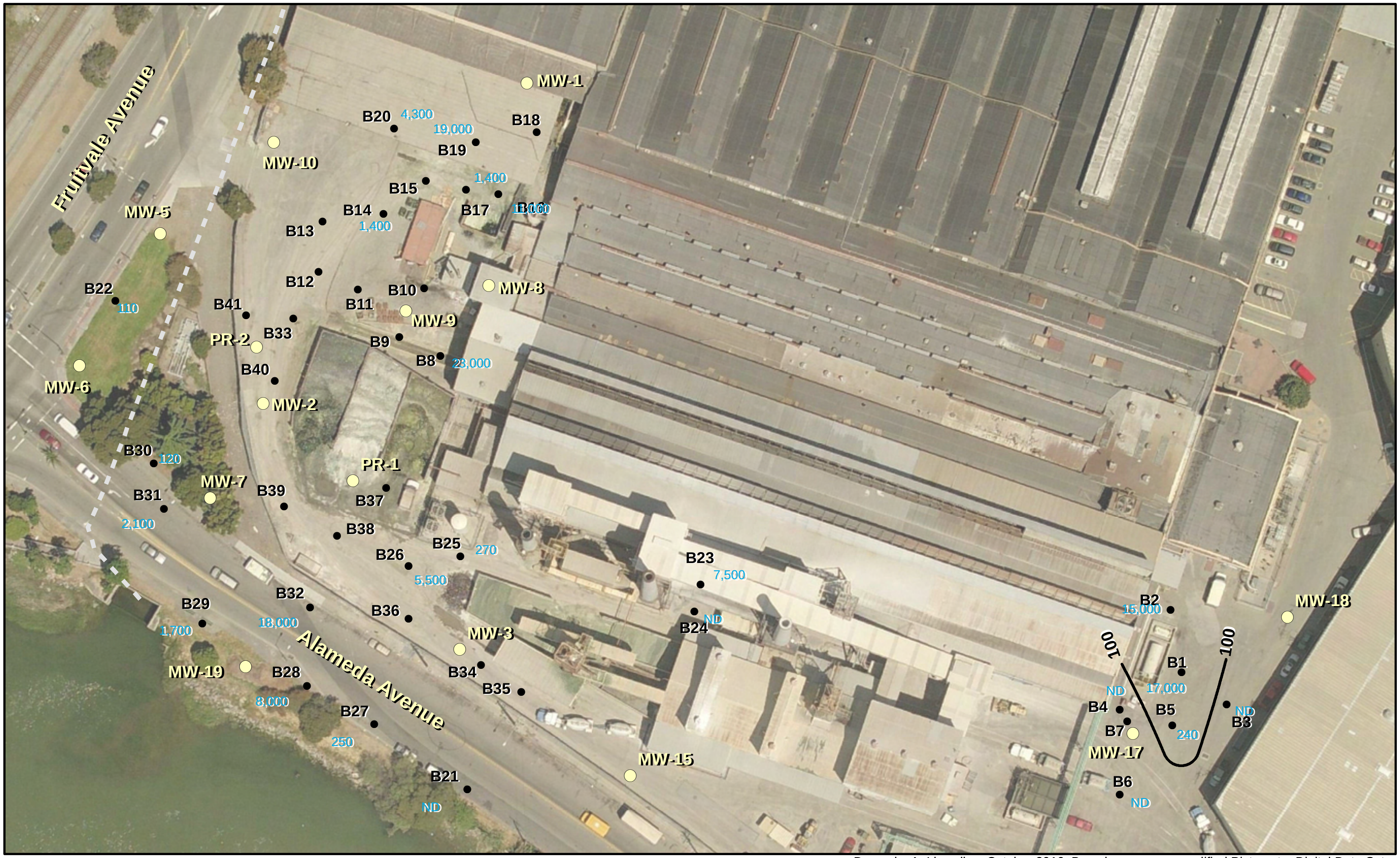
Monitoring Well

Sausal Creek Storm Sewer

CKG Environmental, Inc.

TPHd in Groundwater Distribution Map
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE
4



Drawn by A. Llewellyn. October 2010. Base layers are unmodified Pictometry Digital Data Sets.

EXPLANATION

710 TPHg Concentration from Geoprobe Sample in µg/l

● Geoprobe Location

○ Monitoring Well

Line of Equal TPHg Concentration

Sausal Creek Storm Sewer

0 50 100

Scale in Feet

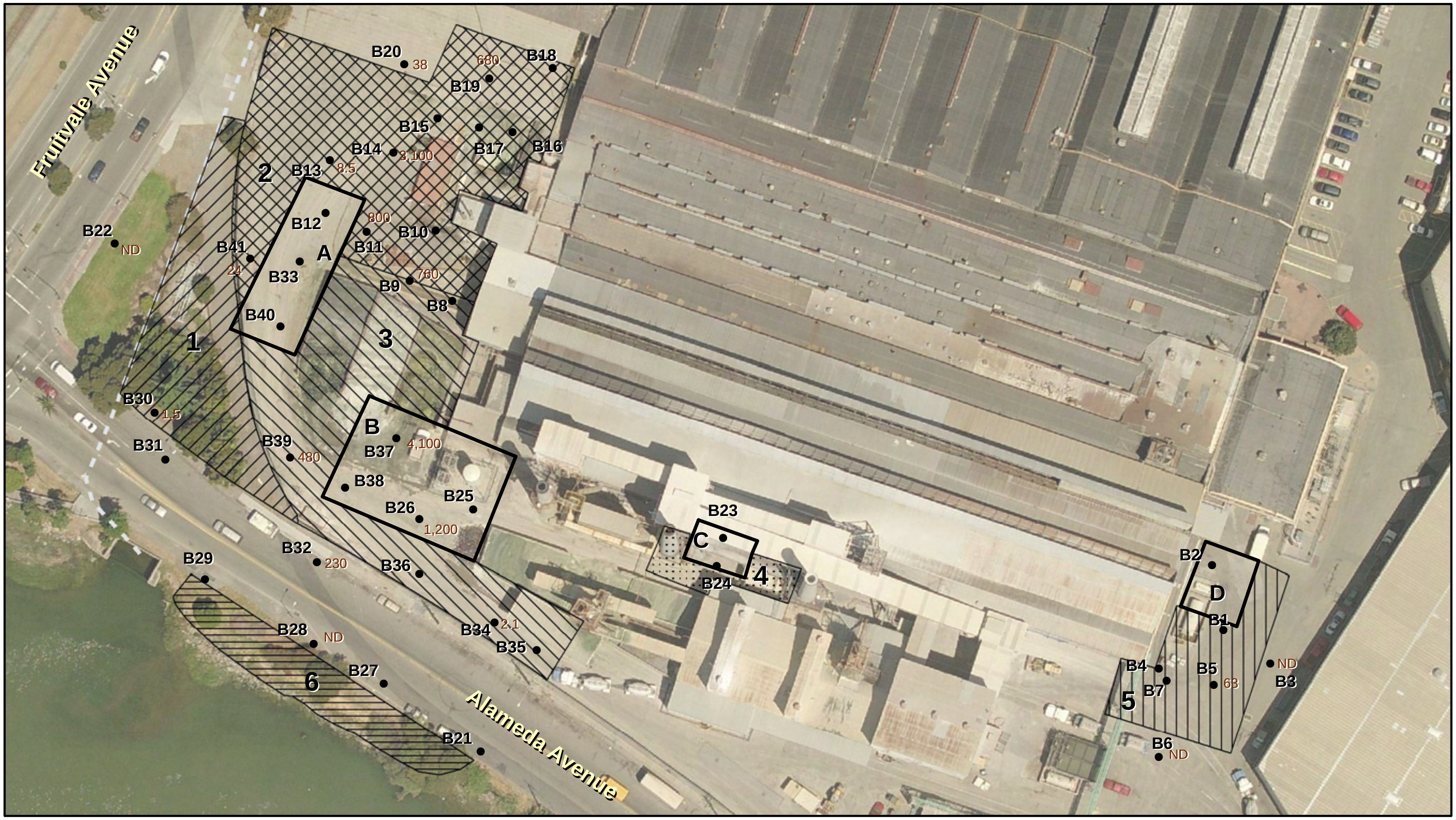
N

S

CKG Environmental, Inc.

TPHg in Groundwater Distribution Map
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE
5



Drawn by A. Llewellyn. October 2010. Base layers are unmodified Pictometry Digital Data Sets.

EXPLANATION

230 TPHd Concentration in mg/kg

• Geoprobe Location

A Soil Source Area and Excavation

ISCO Injection Areas

1

2

3

4

5

6

Sausal Creek Storm Sewer

0 50 100

Scale in Feet

N

S

CKG Environmental, Inc.

Proposed Soil Excavation And ISCO Injection Areas
Owens-Brockway Glass Container Facility
3600 Alameda Avenue, Oakland California

PLATE
6