May 13, 2015

Mr. Keith Nowell
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **Revised Remedial Design and Implementation Plan**

Site: **76 Station No. 5191/5043**
449 Hegenberger Road
Oakland, California
Fuel Leak Case No. RO0000219

Dear Mr. Nowell;

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

If you have any questions or need additional information, please call:

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Pacific Convenience & Fuel
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WSprague@pcandf.com

Sincerely,

PACIFIC CONVENIENCE & FUEL

WALTER SPRAGUE
Director of Retail Services

Attachment

Revised Remedial Design and Implementation Plan

76 Station No. 5191/5043
449 Hegenberger Road
Oakland, California

Alameda County Health Care Services Agency, Fuel Leak Case No. RO0000219

San Francisco Bay, Regional Water Quality Control Board, Case No. 01-1601

GeoTracker Global ID No.T0600101476

Antea Group Project No. I42705191

May 13, 2015

Prepared for:
Mr. Keith Nowell
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

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Appendices

Revised Remedial Design and Implementation Plan

1.0 INTRODUCTION

Antea® Group is pleased to submit this *Revised Remedial Design and Implementation Plan* (RDIP) as requested by the Alameda County Health Care Services Agency (ACHCSA) during a phone conversation on May 5, 2015 about the referenced site in Oakland, California (**Figure 1**).

This RDIP details Antea Group's proposed shallow soil excavation in the southwest and eastern portions of the site. The goal of this proposed remedial action is to excavate the majority of the residual petroleum hydrocarbon impacted soil contributing to the dissolved phase petroleum hydrocarbons in groundwater [total petroleum hydrocarbons - gasoline range organics (GRO), benzene, ethylbenzene, and methyl tertiary-butyl ether (MTBE)].

2.0 SITE DESCRIPTION

The subject site is an operating 76 station located on the southwestern corner of Hegenberger Road and Edgewater Drive in Oakland, California **(Figure 1).** This site contains six fuel dispensers on two islands under a single canopy, three fuel underground storage tanks (USTs) on the north side of the site, a carwash facility on the west side of the site, and a station building in the central portion of the site. The current site features are shown on **Figure 2**. A summary of previous site assessment, environmental investigations, remedial activities, and sensitive receptors are presented in **Appendix A.**

3.0 GEOLOGY AND HYDROGEOLOGY

The following sections provide a summary of the regional and site-specific geologic and hydrogeologic setting.

3.1 Regional Geologic Setting

The site is located on the western portion of the East Bay Plain Subbasin near the Oakland Airport. This area is primarily underlain by bay mud and artificial fill.

3.2 Regional Hydrogeologic Setting

According to the California Department of Water Resources' (DWR) *California's Groundwater, Bulletin 118 – Update 2004,* the site is located in the Santa Clara Valley Groundwater Basin – East Bay Plain Subbasin. Groundwater bearing formations in the subbasin include the Early Pleistocene Santa Clara Formation, Late Pleistocene Alameda Formation, Early Holocene Temescal Formation, and artificial fill. East Bay Plain Subbasin has existing beneficial uses as irrigation, municipal, and domestic water supplies (DWR, 2004).

3.3 Site Geologic and Hydrogeologic Conditions

The site is underlain by Holocene-age bay mud. The bay mud typically consists of unconsolidated, saturated clay and sandy clay that is rich in organic material. The bay mud locally contains lenses and stringers of silt, well-sorted sand and gravel, and beds of peat. The most recent monitoring and sampling event was conducted at the site on March 16, 2015. The measured depth to groundwater ranged from 2.40 feet to 4.18 feet below top of casing (TOC). The groundwater flow direction was variable across the site

3.4 Sensitive Receptors

On April 24, 2006 TRC completed a sensitive receptor survey for the site. According to the Department of Water Resources (DWR) records, there are two irrigation wells and one industrial well located within one-half mile of the site. The nearest well, is an irrigation well located approximately 1,080 feet southeast of the site. The other irrigation well is located approximately 2,623 feet southeast of the site and the industrial well is located approximately 2,570 feet northeast of the site.

In addition, two surface water bodies are located within a one-half mile radius of the site. San Leandro Creek is located approximately 1,400 feet southwest of the site and flows into the San Leandro Bay. Elmhurst Creek is located approximately 2,220 feet north of the site and also flows into the San Leandro Bay.

4.0 SCHEDULE OF SITE WORK

Work on both excavation areas, A1 and A2 (**Figure 3**), will commence in the summer of 2015 once all preparations are complete.

4.1 Groundwater Monitoring Wells

Antea Group submitted the *Work Plan – Well Destruction*, Dated May 8, 2014 to the ACHCSA. The work plan detailed the destruction of monitoring wells MW-12, MW-12A, and MW-17 before commencing the excavation of A1 and the destruction of monitoring wells MW-6 and MW-14 before commencing the excavation of A2 as depicted on **Figure 3**. The work plan was approved by ACHCSA in an email dated June 2, 2014. The email also recommended that monitoring well MW-10 be destroyed due to its proximity to excavation A1. Monitoring wells MW-10, MW-12, MW-12A, and MW-17 were destroyed on June 18, 2014 by pressure grouting in preparation of the proposed excavation activities. Monitoring wells MW-6 and MW-14 will be destroyed prior to the beginning of the excavation work in area A2.

During excavation activities on-site personnel will be instructed not to drive heavy equipment over well boxes or place out-riggers on the well boxes. A responsible person will be designated to be on-site to direct construction traffic to insure the well covers are not driven over during excavation activities.

Re-installation of shallow monitoring wells in the vicinity of excavation A1 and A2 will be discussed with the ACHCSA upon the completion of the excavations.

4.2 On-Site Utility Encroachment

Antea Group will contact Underground Service Alert (USA) and contract a private utility locator at least 72 hours prior to the initiation of excavation activities in order to clear the proposed excavation area of underground utilities. Antea Group will additionally request that utilities identified within 10 feet of the excavation limits be physically exposed by the utility owner.

As depicted on **Figure 4**, electrical connections servicing the street lights and sprinkler system extend through the planned excavation A1 and electrical connections servicing the station building extend through the planned excavation A2. Prior to the start of excavation, a State of California licensed C-10 electrical contractor will perform disconnection and removal of electrical lines located within 10 feet of the proposed excavation area A-1. The electrical connection servicing the station building will be de-energized and a licensed C-10 electrical contractor will daylight the utility line throughout the excavation area A-2 so the exact location of the underground utility is known. Shoring will be installed a minimum of 2 feet from the utility on both sides. Once the shoring is in place the line will be re-energized to continue operation of the station building.

4.3 Shoring and Security

Antea Group has determined that the best method for excavation will be to utilize slot trenching techniques and backfilling with controlled density fill (CDF) and base rock in excavation area A1. The use of CDF along with slot trenching will eliminate the need for shoring in the excavation area A1. During excavation activities in area A-1, the exclusion zone will be fenced off for security.

Antea Group has determined that the best method for excavation of area A2 will be a conventional excavation with sheet pile shoring installed on all sides of the excavation. During excavation activities in area A2, the exclusion zone will be fenced off for security.

4.4 Dewatering Plan

Based on the depth of the excavation and historic ground water elevations indicated in the *Quarterly Summary Report, Third Quarter 2014*, the excavation**s** will require dewatering. The average depth to water during the previous three years in excavation A2 (MW-6) has been 2.85 f**ee**t with a range of 2.9-8.4 f**ee**t; and, the average depth to water during the previous two years in excavation A1 (MW-12) has been 3.08 f**ee**t with a range of 3.35-4.4 f**ee**t. Based on a soil porosity of 30%, the approximated volumes to be de-watered from each excavation area are: 15,000 gallons from A1, and 74,000 gallons from A2. Based on lithology of the site being homogeneous across the site and the re-charge rate of monitoring well MW-6 a constant pump rate of at least 0.5 gallons/minute will be maintained during excavation and backfilling activities after initial de-watering is complete. Based on this

data, Antea Group anticipates that the excavations can be dewatered to twelve (12) feet effectively using a submersible or centrifugal pump. All extracted groundwater will be pumped into holding tanks on-site (**Figure 5**). The groundwater will be processed through the holding tanks to allow suspended solids to settle out, sampled and discharged to the sanitary sewer or sampled and trucked off-site to an approved disposal facility.

4.5 Environmental Control Measures

A basic and site-specific storm water pollution prevention plan (SWPPP) will be prepared using best management practices (BMPs) such as those described in the *Construction Best Management Practice Handbook* prepared by the California Stormwater Quality Association (CASQA) in 2009. Antea Group will coordinate with Pacific Convenience and Fuels (PC&F) in determining the potential need to obtain a *Construction General Permit* for discharge.

Types of minimum techniques and practices defined in the SWPPP and implemented by the General Engineering Contractor may include the following:

- Berming down-sloping portions of the site with booms/sand/gravel bags;
- Installing stormwater control devices around the site perimeter;
- Protecting existing catch basins with booms/sand/gravel bags.

Dust control techniques will be implemented by the General Engineering Contractor at all times during the excavation, loading, and backfilling activities to prevent the formation and migration of visible dust. These techniques may include the following:

- Misting or spraying water at least twice daily to prevent formation of dust while excavating, loading, or backfilling;
- Controlling and monitoring excavation activities to minimize the generation of dust;
- Minimizing drop heights while loading transportation vehicles;
- Covering all trucks hauling soils or backfill materials, and requiring all trucks to maintain at least 2-feet of freeboard.
- Covering any stockpiles of clean fill material or top soils with weighted plastic;
- Sweep site daily if visible soil is on paved areas and being carried on public right-of-way.

Air monitoring will be performed to establish background air quality using a photoionization detector (PID) to measure ambient volatile organic compound (VOCs) concentrations, and a multi-gas lower explosive limit (LEL) detector to measure LEL, oxygen, carbon monoxide, and hydrogen sulfide. Antea Group will prepare an Air Monitoring Plan for use during excavation activities.

4.6 In-Situ Chemical Oxidation

To accelerate biodegradation of the dissolved hydrocarbon plume, Regenesis brand Oxygen Release Compound Advanced® (ORC-A®) will be added to the excavation backfill. ORC-A is a proprietary formulation of phosphate-intercalated magnesium peroxide that, when hydrated, produces controlled-release oxygen.

Regenesis, the ORC-A manufacturer, recommends between 1% and 0.1% application by weight. We chose to use 1/3 of 0.1% (or 0.0333%). The excavation A1 is planned for approximately 316 yards, or approximately 380 tons (conversion factor of 1.2 ton/cy, rounded up). 0.0333% of 380 tons is approximately 250 lbs. The excavation A2 is planned for approximately 1,830 yards, or approximately 2,200 tons. 0.0333% of 2,200 tons is approximately 1,500 lbs. ORC-A comes in pellet form and will be applied to the bottom of each excavation prior to backfilling. The groundwater infiltration into the backfilled excavation will assist in the releasing of oxygen to the shallow aquifer. The amount of ORC-A used will be based upon the limits of the final excavations. The Material Safety Data Sheet for ORC-A, ORC-A brochure, and application instructions are attached as **Appendix B**.

4.7 Soil Sampling Plan

Confirmation soil samples will be collected at the final depth of the soil excavation and at accessible sidewalls. Confirmation samples will be collected at discrete locations using an approximate 20-foot by 20-foot grid for the bottom of each excavation area and approximately every 20 linear feet along the length of accessible excavation sidewalls staggering depths between 0-5 feet bgs and 5-10 feet bgs. Since the total depth of the excavation areas is greater than 4-feet deep, confirmation samples will be collected from the excavator bucket. A minimum of two (2) confirmation soil samples will be collected from the base of each excavation. If the excavation floor exceeds 625 square feet, additional soil samples will be collected at one soil sample per 625 square feet. Antea Group personnel will screen soil samples using a PID prior to submitting the samples for laboratory analyses.

Confirmation soil samples collected for laboratory analyses will be submitted to a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory for the following analyses:

- TPHg, BTEX, MTBE, tertiary-butyl alcohol (TBA), ethyl-tertiary-butyl ether (ETBE), tertiary-amyl methyl ether (TAME), di-isopropyl ether (DIPE), ethylene dibromide (EDB), ethanol, 1,2-dichloroethane (1,2-DCA), and naphthalene by EPA Method 8260B.

4.8 Disposal of Waste and Truck Management

Waste hauling will be performed by a hauling contractor arranged by the General Engineering Contractor (GEC) that is licensed and permitted as required by the United Stated Environmental Protection Agency (EPA), Department of Transportation, and the State of California. Trucks will use only pre-planned and authorized routes established in a site-specific Traffic Control and Waste Transportation Plan, which will be completed upon the approval of this RDIP and include pedestrian safety procedures. Trucks used for the off-site transportation of impacted soil and debris will remain in clean, regularly swept areas, to the extent possible, to minimize the need to decontaminate the truck tires. Each loaded truck will be equipped to fully cover all soil and debris during transportation and leave the site with a completed manifest or bill of lading for transport of the soil to the assigned disposal facility, Republic Landfill in Livermore, CA. It is unknown at this time how many trucks the GEC is planning on using during the excavation activities. Antea Group does not plan to stockpile excavated soil on-site at this time.

4.9 Backfill

Excavation area A1 will be backfilled with CDF from the total depth of the excavation to 7 feet bgs. 4.5 feet of base rock will be placed and compacted on top of the CDF and the remaining 0.5 feet will be backfilled with asphalt, concrete, or landscaping to match the pre-excavation construction.

Excavation area A2 will be backfilled with 1.5-inch drain rock from the total depth of the excavation to 2 feet bgs. A geo-fabric will be placed over the drain rock to add stability and allow 1.5 feet of base rock to be placed and compacted over the drain rock. Asphalt will be installed over the base rock to match pre-excavation construction.

5.0 REMARKS

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. For any reports cited that were not generated by Delta or Antea Group, the data from those reports is used "as is" and is assumed to be accurate. Antea Group does not guarantee the accuracy of this data for the referenced work performed nor the inferences or conclusions stated in these reports. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Edward T. Weyrens, G.I.T.
Project Professional
Antea Group

Reviewed by:

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STATE OF CALIFORNIA

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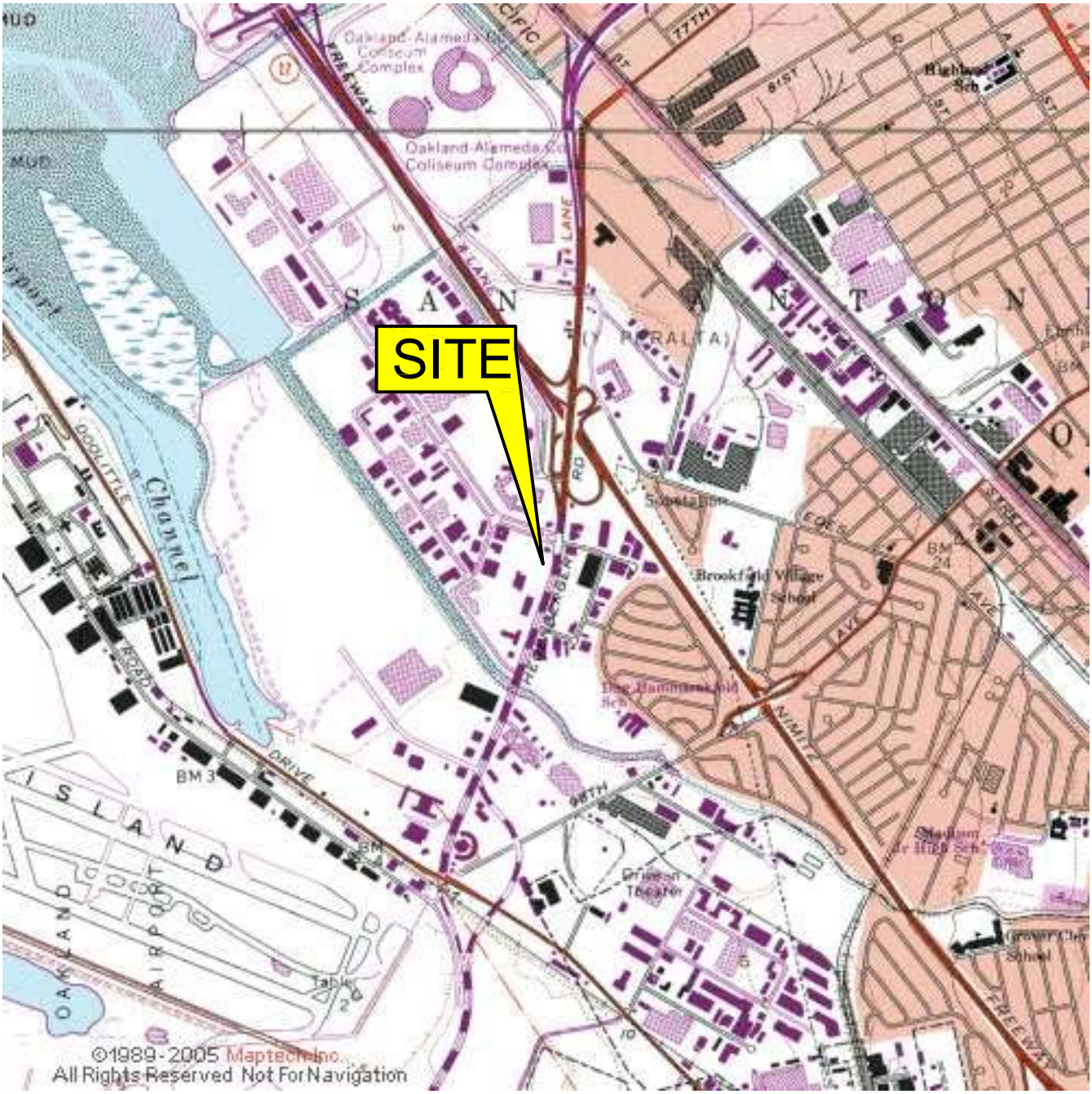
Senior Project Manager
California Registered Professional Geologist No. 7480
Antea Group

cc: GeoTracker (upload)

Figures



North

0 900 1800 FT

SCALE

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, OAKLAND EAST QUADRANGLE (1973)

FIGURE 1
SITE LOCATION MAP

76 STATION NO. 5191/5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142705191	EW	DR/JH
DATE	REVIEWED BY	FILE NAME
1/31/11	DD	5043-SiteLocator

antea group

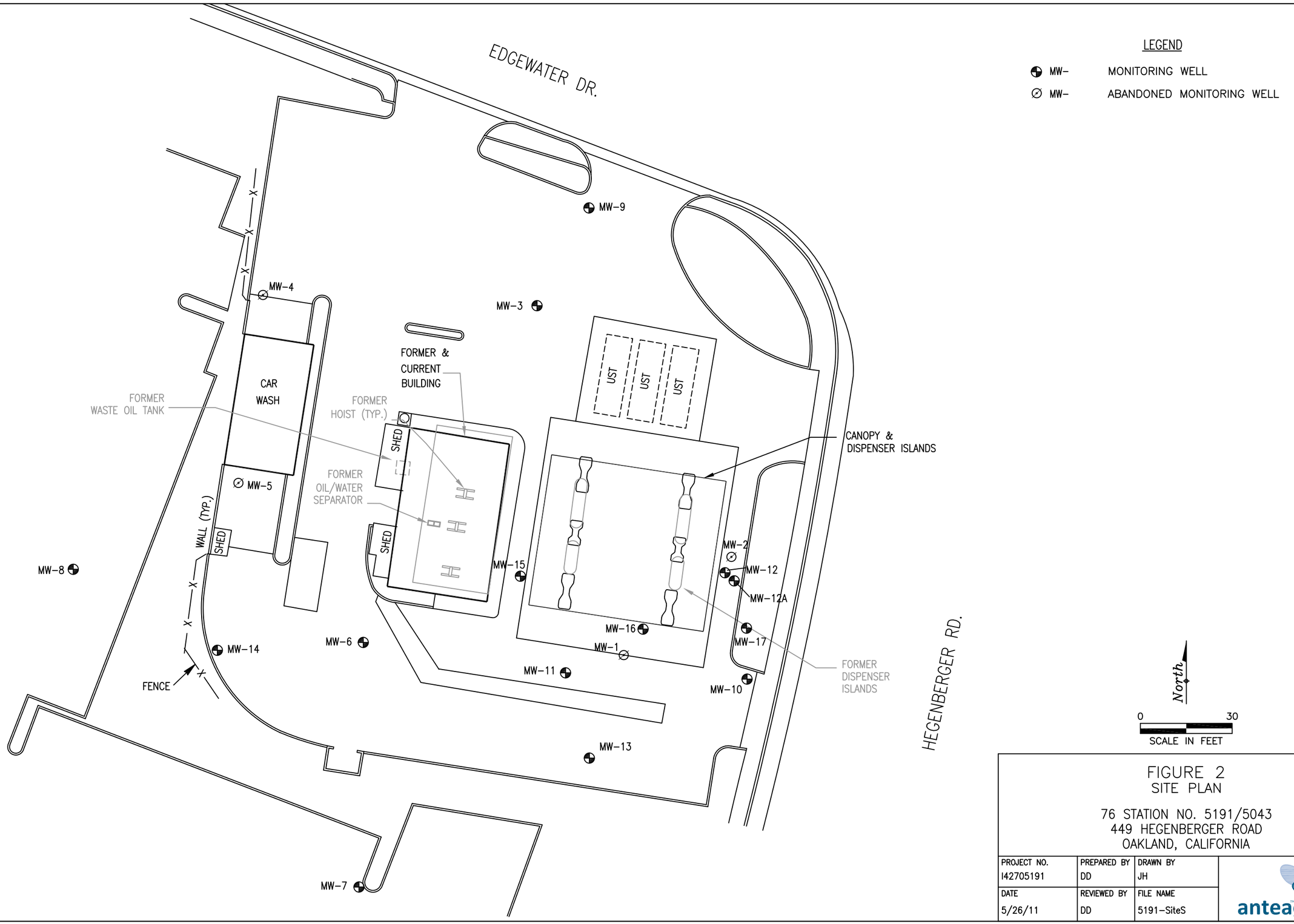


FIGURE 2
SITE PLAN

76 STATION NO. 5191/5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142705191	DD	JH
DATE	REVIEWED BY	FILE NAME
5/26/11	DD	5191-SiteS

antea group

EDGEWATER DR.

GRASS AND TREES

HEGENBERGER RD.

MW-9

MW-4

MW-3

MW-5

MW-8

MW-7

MW-14

MW-6

MW-16

MW-1

MW-11

MW-13

MW-10

MW-15

MW-2

MW-12

MW-12A

MW-17

CAR WASH

FORMER WASTE OIL TANK

FORMER HOIST (TYP.)

FORMER & CURRENT BUILDING

FORMER OIL/WATER SEPARATOR

FORMER DISPENSER ISLANDS

CANOPY & DISPENSER ISLANDS

SHED

WALL (TYP.)

UST

A1

A2

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8 SW8(6)

FBSW1 FBSW2 FBSW3 FBSW4

FB1 FB2/RF1 FB3/RF2 FB4

WO1

UH-1 UH-2 UH-3

OWS-1

HS-4-E HS-4-S HS-4-W HS-4-N

B1 B2 B3 B4

P1 P2 P3 P4

D1/BD1 D2/BD2 BD3 BD4

HPB-1 HPB-2 HPB-3 HPB-4 HPB-5

SB-1 SB-2 SB-3 SB-4 SB-5 SB-6 SB-7 SB-8 SB-9 SB-10

FS-1

WE1 WE2 WE3

MW1SW1 MW1SW2

B-4 B-5 B-6

S1 S2 S3 S4

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MW- MONITORING WELL
- MW- DESTROYED MONITORING WELL
- SB- SOIL BORING LOCATION (ANTEA GROUP 2013/2014
- HPB- SOIL BORING LOCATION (ANTEA GROUP 2012)
- B- BORING LOCATION
- SOIL SAMPLE LOCATION
- 1995 EXCAVATION AREA
- PROPOSED EXCAVATION AREA

North

0 30

SCALE IN FEET

ADAPTED FROM A MORROW SURVEY ON 5/23/11 AND A SOIL SAMPLING REPORT AND CONTINUING GROUNDWATER INVESTIGATION BY KAPREALIAN ENGINEERING, INC., 6/2/95

FIGURE 3
SITE PLAN WITH PROPOSED EXCAVATIONS

76 STATION NO. 5191/5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142705191	JF	JH
DATE	REVIEWED BY	FILE NAME
3/11/15	DD	5191-SiteS

antea group

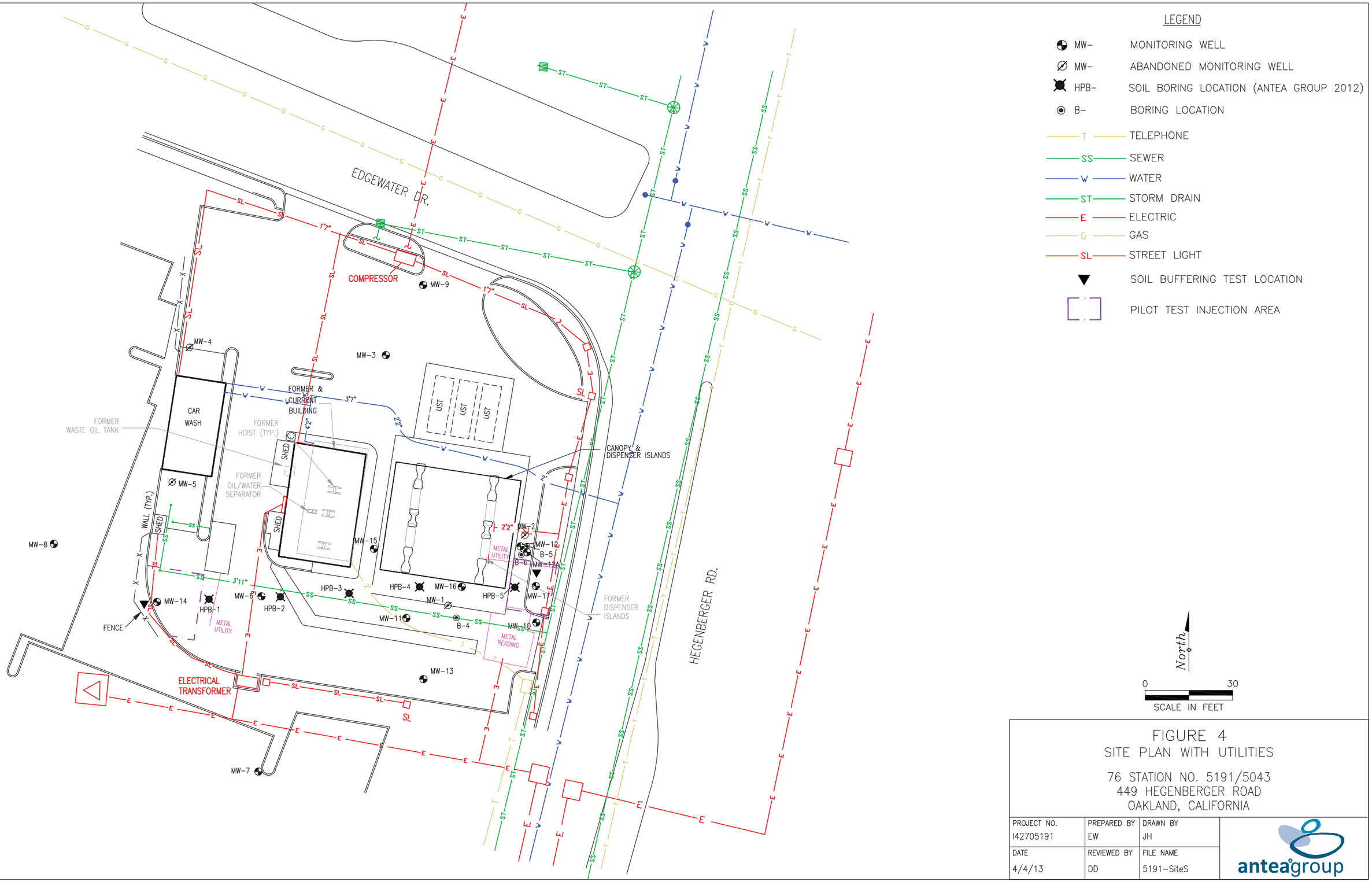
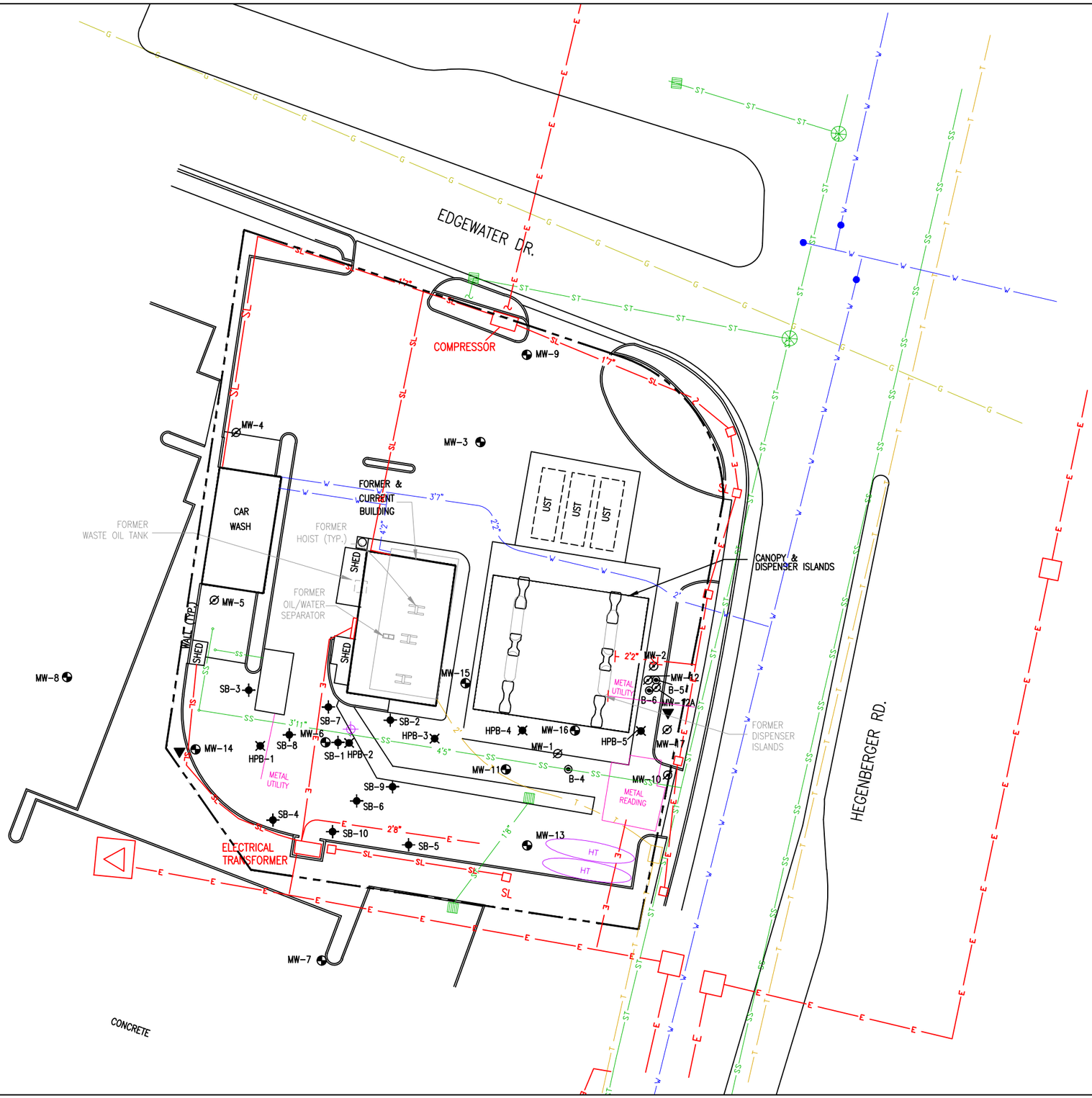


FIGURE 4
SITE PLAN WITH UTILITIES

76 STATION NO. 5191/5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142705191	EW	JH
DATE	REVIEWED BY	FILE NAME
4/4/13	DD	5191-SiteS

antea group



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MW– MONITORING WELL
- MW– ABANDONED/DESTROYED MONITORING WELL
- SB– SOIL BORING LOCATION (ANTEA GROUP 2013/2
- HPB– SOIL BORING LOCATION (ANTEA GROUP 2012)
- B– BORING LOCATION
- T TELEPHONE
- SS SEWER
- W WATER
- ST STORM DRAIN
- E ELECTRIC
- G GAS
- SL STREET LIGHT
- SOIL BUFFERING TEST LOCATION
- HT POSSIBLE LOCATION OF WATER STORAGE TANK
- POSSIBLE DISCHARGE POINT FOR WATER REMOVED FROM THE EXCAVATION

North

0 30

SCALE IN FEET

ADAPTED FROM A MORROW SURVEY ON 5/23/11

FIGURE 5
SITE PLAN WITH PROPOSED WATER STORAGE TANKS

76 STATION NO. 5191/5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142705191	EW	JH
DATE	REVIEWED BY	FILE NAME
10/28/14	DD	5191–SiteS

antea group

Appendix A

Site Details and Previous Environmental Investigations

PREVIOUS INVESTIGATION AND SITE HISTORY SUMMARY

October 1991 - Four soil samples were collected from the product pipe trenches at depths of approximately 3 feet below ground surface (bgs) during a dispenser island modification. The product pipe trenches were subsequently excavated to the groundwater depth at 4 to 4.5 feet bgs.

February 1992 - Three monitoring wells, MW-1 through MW-3, were installed at the site to depths ranging from 13.5 to 15 feet bgs.

August 1992 - Three additional monitoring wells, MW-4 through MW-6, were installed at the site to a depth of 13.5 feet bgs.

September 1994 - One 280-gallon waste-oil UST was removed from the site. The UST was made of steel, and no apparent holes or cracks were observed in the UST. One soil sample was collected from beneath the former UST at a depth of approximately 9 feet bgs. No petroleum hydrocarbons were reported.

January 1995 - Two additional monitoring wells, MW-9 and MW-10, were installed to depths of 13 and 15 feet bgs. In addition, monitoring wells MW-4 and MW-5 were destroyed by over-drilling the wells and backfilling with neat cement.

March 1995 - Two 10,000-gallon gasoline USTs and one 10,000-gallon diesel UST were removed from the site. Groundwater was encountered in the tank cavity at a depth of approximately 8.5 feet bgs. Soil samples contained total petroleum hydrocarbons as diesel (TPHd) and benzene, and TPH as gasoline (TPHg). Approximately 125,000 gallons of groundwater were pumped from the site for remediation and properly disposed off-site. Four fuel dispenser islands and associated product piping were also removed. Based on the results of the confirmation samples, the product dispenser islands were over excavated to approximately 6 feet bgs.

March-April 1995 - During demolition activities of the former station building, soil samples were collected from two excavations, which were subsequently over excavated. Confirmation samples contained petroleum hydrocarbons. An additional area on the south side of the former station building was excavated based on photo-ionization detector (PID) readings. Two monitoring wells, MW-1 and MW-2, were destroyed in order to allow for over excavation activities to extend to an area adjacent to the dispenser islands in the southeastern quadrant of the site. The excavated areas were subsequently backfilled with clean-engineered fill.

April 1997 - Two additional monitoring wells, MW-7 and MW-8, were installed off-site to the south and east on the neighboring property to a depth of 13 feet bgs. In addition, monitoring well MW-3, which was damaged during site renovation activities, was fully drilled out and reconstructed in the same borehole.

October 2003 - Site environmental consulting responsibilities were transferred to TRC.

April 8-9, 2005 - TRC conducted a 24-hour dual phase extraction (DPE) test at the site using monitoring well MW-6. The 24-hour DPE test was only moderately successful at removing vapor-phase petroleum hydrocarbons from the subsurface; therefore, TRC recommended DPE no longer be considered a viable remedial alternative for the site.

October 2007 - Site environmental consulting responsibilities were transferred to Delta Consultants.

December 2009 - Delta advanced two borings, B-4 and B-5, to depths of 20 feet bgs and 32 feet bgs, respectively. Analytical results from the soil and groundwater samples collected from these two borings indicated that the soil and the groundwater were impacted by petroleum hydrocarbons at these locations.

June 2010 – Delta installed two 4-inch diameter monitoring/extraction wells, MW-11 and MW-12, and two 2-inch diameter monitoring wells, MW-12A and MW-13, at the site. Analytical results from the soil and groundwater samples collected from the MW-12 and MW-12A boring locations indicated that the soil and the groundwater were impacted by petroleum hydrocarbons at these locations.

May 2011 – Antea Group (formally Delta Consultants) installed four 2-inch diameter monitoring wells, MW-14 through MW-17, and advanced one soil boring, B-6, at the site. All four monitoring wells were installed with ten feet of screen from 3 feet bgs to 13 feet bgs. Analytical results of soil samples collected during the monitoring well installation reported TPHg concentrations ranging from 1.0 milligrams per kilogram (mg/kg) (MW-14d13) to 2,490 mg/kg (B-6d9), benzene concentrations ranging from 0.67 mg/kg (B-6d21) to 26.4 mg/kg (B-6d9), toluene concentrations ranging from 0.2 mg/kg (MW-14d10) to 73.9 mg/kg (B-6d9), ethylbenzene concentrations ranging from 0.037 mg/kg (MW-14d13) to 58.1 mg/kg (B-6d9), total xylenes concentrations ranging from 0.066 mg/kg (MW-14d13) to 230 mg/kg (B-6d9), methyl tertiary-butyl ether (MTBE) concentrations ranging from 0.015 mg/kg (MW-15d13) to 0.19 mg/kg (MW-15d8), tertiary-butyl alcohol (TBA) concentrations ranging from 0.014 mg/kg (MW-16d8 and B-6d21) to 0.16 mg/kg (MW-15d8), and lead concentrations ranging from 5.5 mg/kg (MW-16d13) to 16.3 mg/kg (MW-17d9). Diesel range organics (DRO) and DRO with silica gel concentrations were reported; however, all of the results did not match the laboratory standard for diesel. Concentrations of DRO ranged from 2.9 mg/kg (MW-17d13) to 258 mg/kg (B-6d14) and DRO with silica gel concentrations ranged from 2.5 mg/kg (MW-17d13) to 250 mg/kg (B-6d14).

March 2012 – Antea Group advanced five soil borings (HPB-1 through HPB-5) at the site. The borings were advanced using direct push technology. The borings were used to obtain a hydraulic profile of the substrate beneath the site. The data obtained during the investigation will be used to determine the best path forward in terms of remediation.

July 2013 – Antea Group advanced ten soil borings (SB-1 through SB-10) at the site. The borings were advanced using direct push technology. The borings were used to delineate petroleum hydrocarbon impacted soil around

monitoring well MW-6. Results of the investigation can be found in the *Site Investigation Report*, dated January 9, 2014.

June 2014 – Antea Group destroyed monitoring wells MW-10, MW-12, MW-12A, and MW-17 by pressure grouting. The wells were destroyed in preparation for on-site soil excavation activities.

September 2014 – Antea Group advanced two (2) cone penetration test (CPT) borings CPT-1 and CPT-2 in preparation for soil excavations on site. Soil and groundwater samples were not collected. Data from the CPT borings was used to help design shoring for excavations. Antea Group advanced three (3) off-site soil borings, SB-13 through SB-15. Soil and grab-groundwater samples were collected from the borings.

SENSITIVE RECEPTORS

April 24, 2006, TRC completed a sensitive receptor survey for the site. According to the Department of Water Resources (DWR) records, three water supply wells are located within one-half mile of the site. The closest well is an irrigation well, reported to be, approximately 1,080 feet southeast of the site. In addition, two surface water bodies were observed within a one-half mile radius of the site. San Leandro Creek is located approximately 1,400 feet southwest of the site and flows into the San Leandro Bay. Elmhurst Creek is located approximately 2,220 feet north of the site and also flows into the San Leandro Bay.

Current Consultant: **Antea Group**

Appendix B

Regenesis ORC Advanced® Material Safety and Data Sheet, Brochure, and Application Instructions

DUST MINIMIZING FORMULATION FOR EXCAVATIONS, TANK PITS AND TRENCHES

DESCRIPTION

ORC Advanced® Pellets (ORC-A Pellets) are a pelletized version of REGENESIS' widely used ORC Advanced and are designed specifically for direct application into excavations, tank pits and trenches. This pelletized, dry application material minimizes airborne dust while eliminating the need for specialized equipment and spray water required for powder-slurry applications. ORC Advanced Pellets are approximately 3-10 mm in size as shown in Figure 1.

FIGURE 1: ORC-A PELLETS ARE APPROXIMATELY 3-10 MM SIZE

FEATURES & BENEFITS

- Optimal for use in excavations, tank pits and trenches where enhanced aerobic bioremediation is appropriate
- Pellet size (3-10 mm) minimizes airborne dust during handling and application of the material
- Dry application form eliminates need for water and equipment required for powder-slurry application types
- Patented technology provides long-term, controlled release oxygen for periods of up to 12 months on a single application
- Unique molecular structure delivers highest amount of active oxygen available, up to 15% by weight
- Contains micro-nutrients including: nitrogen, phosphorus and potassium (N,P,K) which may benefit aerobic microorganisms

FUNCTION

The primary function of ORC-A Pellets is to provide a controlled-release oxygen source for the enhanced aerobic bioremediation of petroleum hydrocarbons or other aerobically degradable compounds. This is achieved through the use of patented processes which embed phosphates into the crystalline structure of solid peroxygen molecules. This feature slows the reaction that releases oxygen upon hydration, producing an optimized, controlled-release of oxygen over a period of up to 12 months. ORC-A Pellets deliver up to 15% active oxygen by weight and contain micro-nutrients such as: nitrogen, phosphorus, and potassium (N,P,K) which may be beneficial to aerobic biodegradation processes.

Note: Due to the size of the pellets this material is not recommended or designed for use in direct-injection or fixed well applications.

REGENESIS

Advanced Technologies for Contaminated Site Remediation

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REGENESIS ORC ADVANCED® PELLETS

Dust Minimizing Formulation for Excavations, Tank Pits and Trenches

PRODUCT APPLICATION INSTRUCTIONS

Introduction

The features and benefits of controlled-release, ORC Advanced are posted in other areas (product brochure, www.regenesis.com, and MSDS). From the field application standpoint, the benefits of ORC Advanced® Pellets (ORC-A Pellets) are in ease of handling and Health & Safety. Pelletized ORC Advanced is much easier to use because it eliminates the need for water and equipment associated with spray application and Health & Safety are dramatically improved by elimination of ORC Advanced dust and associated respiration issues. The later feature makes the material much easier to handle in open-air application approaches such as excavations and trenches.

Design Considerations

The new configuration of this material does not change the quantity estimated in the design process. The materials' available oxygen is up to 17% by weight and its physical attributes are designed to be easier to handle through the use of a pelletized version of the product and the elimination of the dust associated with dry application of ORC Advanced powder.

Application Methods

The pelletized form allows the user to simply and easily apply the ORC Advanced in a dry format using existing on-site operations or by manual methods. Some typical methods include:

- Application via the excavator bucket:
  - Simply insert a pre-determined quantity (unit - bucket or bag) of ORC-A Pellets into an excavator bucket and use the excavator to mix and distribute the ORC-A Pellets into previously backfilled soil
- Application via manual or mechanical broadcasting/spreaders:
  - Manually or mechanically broadcast/spread pelletized ORC-A Pellets into the excavation at a pre-determined rate per unit of backfill material or per soil lift (as the soil is being backfilled)
  - Follow the manual broadcast step with mechanically mixing the ORC-A Pellets directly into the backfill using the excavator equipment

Example Estimates:

Using an example unit weight of ORC-A Pellets (40 lb. bag)

For a 0.1% weight of ORC-Advanced to backfill:

- Each 100,000 lbs. of soil
- Apply 100 lbs. (4 buckets) ORC-A Pellets

PRODUCT APPLICATION INSTRUCTIONS

For a 0.2% weight of ORC-Advanced to backfill:

- Each 100,000 lbs. of soil
- Apply 200 lbs. (approx. 5 bags) ORC-A Pellets

Example Estimates (SI Units):

Using an example unit weight of ORC-A Pellets (18.1 kg bag)

For a 0.1% weight of ORC-A Pellets to backfill:

- Each 45 metric tons of soil
- Apply 45 kg (approx. 3 bags) ORC-A Pellets

For a 0.2% weight of ORC-A Pellets to backfill:

- Each 90 metric tons of soil
- Apply 90 kg (approx. 5 bags) ORC-A Pellets