EAST BAY
MUNICIPAL UTILITY DISTRICT

December 17, 2008

Mr. Paresh Khatri, Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: *Work Plan for Additional Investigation* for Fuel Leak Case No. RO0000030 and Geotracker Global ID T0600102115, EBMUD Adeline Maintenance Facility, 1200 21st Street, Oakland, CA 94607

Dear Mr. Khatri:

The East Bay Municipal Utility District (EBMUD) is submitting the enclosed *Work Plan for Additional Investigation* for the subject property in response to your October 24, 2008 request.

EBMUD's Adeline Maintenance Facility is located on 1200 21st Street in Oakland, Alameda County. This site used to house, among other structures, a gasoline station and EBMUD's Auto Shop and Machine Shop before reconstruction in the late 1990s. Several underground storage tanks existed on this site but were removed before and during the reconstruction. Your October 24, 2008 letter expressed concerns about residual petroleum hydrocarbon contamination present in three areas around and potentially underneath the present-day Shops Building and Central Warehouse.

This work plan proposes to drill approximately 47 direct-push soil borings with a Geoprobe drilling rig equipped with a membrane interface probe (MIP) or hydrogeologic profiling tool (HPT) to collect soil and grab groundwater samples and delineate the extent of soil and groundwater contamination. EBMUD will prepare a report presenting the results and findings of the investigation to include recommendations for installation of remediation and/or monitoring wells, if warranted.

CERTIFICATION

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

If you have any questions, please contact me at (510) 287-0345 or Derek Lee, Senior Environmental Health and Safety Specialist, at (510) 287-1086.

Sincerely,

John H. Schroeter, P.E.
Manager of Environmental Compliance

375 ELEVENTH STREET • OAKLAND • CA 94607-4240 • TOLL FREE 1-866-40 -EBMUD

WORK PLAN FOR ADDITIONAL INVESTIGATION

East Bay Municipal Utility District
Adeline Maintenance Facility
1200 21st Street
Oakland, California

Alisto Project No. 10-654-39

Prepared for:

East Bay Municipal Utility District
375 11th Street; M.S. 704
Oakland, California 94607

Prepared by:

Alisto Engineering Group
2737 North Main Street, Suite 100
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December 19, 2008

REGISTERED PROFESSIONAL ENGINEER
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WORK PLAN
FOR
ADDITIONAL INVESTIGATION

East Bay Municipal Utility District
Adeline Maintenance Facility
1200 21st Street
Oakland, California

Alisto Project No. 10-654-39

December 19, 2008

1.0 INTRODUCTION

The East Bay Municipal Utility District (EBMUD) retained Alisto Engineering Group (Alisto) to perform an additional site investigation at EBMUD Adeline Maintenance Facility, 1200 21st Street, Oakland, California as set forth in a letter from the Alameda County Health Care Services Agency (ACHCSA) dated October 24, 2008.

The ACHCSA requested EBMUD to conduct additional subsurface investigation at the property to characterize petroleum hydrocarbons in soil and groundwater at three areas of concern (AOC). The three AOCs are as follows: the former gasoline station (AOC-1), former auto shop (AOC-2), and the former waste oil tank (AOC-3) in front of the existing warehouse. A site vicinity map is shown on Figure 1. The layout of the site and location of the three AOCs are shown in Figure 2.

1.1 Site Description

The site is located on 1200 21st Street in Oakland, Alameda County. The distance to the San Francisco Bay is 1.1 miles to the northwest. No active drinking water wells are located within 1,500 feet of the site and the shallow groundwater is not currently used as a drinking water source. The Adeline Maintenance Facility (AMF) site is owned by EBMUD and houses the Central Warehouse and Shops Building.

1.2 Background

Two gasoline-containing USTs (4,000-gallon and 6,000-gallon) were removed in November 1994. These tanks were located adjacent to the former Service Station Building. During this excavation, one 500-gallon concrete encased tank containing oily fluid, two 350-gallon tanks filled with water, and one 300-gallon tank were also encountered and removed. Overexcavation was performed to a depth of 13 to 16 feet below ground surface (bgs). Sampling indicated that high concentrations of petroleum compounds (Total Petroleum Hydrocarbons as gasoline (TPH-G) ranging up to 2,800 milligrams per kilogram (mg/kg)) remained at the maximum extent of the excavation located along West Grand Avenue at depths of 4 feet to 8 feet bgs and in front of the former service bay portion of the adjacent structure.

Prior to construction of the new Shops Building and demolition of the former Central Warehouse, two additional subsurface investigations were conducted. 18 soil borings were completed in January 1995 and 15 additional borings were completed in October 1996. These investigations covered all three AOCs, not just the former gasoline station. The results indicated that surface soils in the areas of the former USTs and beneath the former auto shop needed to be excavated and removed from the site to mitigate the risk associated with the petroleum compounds. In addition, concentrations of total petroleum hydrocarbons as diesel (TPH-D) and total oil and grease (TOG) as high as 15,000 mg/kg and 64,000 mg/kg, respectively, were found in the soil in the area of the former Machine Shop (now Central Warehouse) UST. Similarly, a groundwater sample collected from the same area yielded concentrations of TPH-G, TPH-D, benzene, and MTBE as high as 380 micrograms/liter (µg/L), 16,000 µg/L, 19 µg/L, and 210 µg/L, respectively.

Final remedial excavations of the former gasoline station area (AOC-1) and the former auto shop area (AOC-2) took place in June 1997. Approximately 1,300 cubic yards were removed from AOC-1 and 200 cubic yards from AOC-2.

In summary, the previous investigations at AOC-1 indicate that the extent of TPH-G, TPH-D, and benzene in soil and groundwater is not defined and further investigation is warranted at this time. At AOC-2, the former auto shop, benzene, TOG, and TPH-D were detected in soil samples and the nature and extent of these constituents of concern (COCs) in soil and groundwater has not been adequately defined. Previous remedial excavations might not have fully removed contaminated soil from all identified areas of concern, especially in the vicinity of the former auto shop.

At AOC-3, the 2,500-gallon waste oil tank next to the former Machine Shop was removed in August 1998. The excavation extended to 7.5 to 8 feet bgs. Free product was observed on groundwater that entered the excavation at a depth of approximately 7 feet bgs. Samples from soil beneath the tank showed concentrations of TPH-G, TPH-D, and TOG as high as 85 mg/kg, 2,500 mg/kg, 26,000 mg/kg.

In order to address the concerns of the ACHCSA outlined in the October 2008 letter, Alisto proposes additional assessment of the lateral and vertical distribution of the COCs in the subsurface soil and groundwater. This additional assessment and investigation is proposed to be performed using best available technology (BAT) in the form of advanced subsurface characterization methods. The proposed scope of work includes the following tasks:

- Obtain drilling permits from the ACHCSA

- Perform an underground utility search to clear proposed boring locations of potential underground interferences.

- Drill up to 47 direct-push soil borings with a Geoprobe drilling rig equipped with a membrane interface probe (MIP) or hydrogeologic profiling tool (HPT), and collect soil and grab groundwater samples for laboratory analysis of the COCs.

- Prepare a report presenting the results and findings of the additional investigation to include recommendations for installation of remediation and/or monitoring wells, if warranted

2.0 SCOPE OF WORK

The proposed additional investigation using BAT will involve detailed assessment of the geologic, hydrogeologic and other environmental factors, which may affect the fate and transport of contaminants in the soil and groundwater, including an evaluation of migration of hydrocarbons and volatile organic compounds onto the EBMUD AMF property from offsite sources.

The proposed scope of work for additional investigation will be conducted in accordance with the guidelines and requirements of ACHCSA and RWQCB, and it includes the following tasks:

Task 1: Pre-Field Activities

On receipt of approval of the work plan by the regulatory agencies, pre-field activities will be performed to include: acquiring drilling and encroachment permits; securing access agreements; scheduling and coordinating field activities with subcontractors and appropriate parties; and locating underground utilities at the proposed boring locations.

Task 2: Drilling and Sampling of Soil Borings

To assess the extent of impact of the constituents of concern, approximately 47 soil borings are proposed to be drilled by direct-push technique at locations shown on Figures 3 through 5.

Alisto proposes performing several HPT borings in and around the AOCs first. HPT allows the creation of fast, continuous real-time profiles of soil hydraulic properties, enabling the location of preferential migration pathways for contaminants in the subsurface. HPT accomplishes this by pumping, at a low flow rate, clean water through a screen on the side of the HPT probe. Injection pressure is monitored and plotted with depth in real time, with a relatively high pressure response indicating a relatively small grain size and the lack of ability to transmit water. Whereas a relatively low pressure response would indicate a relatively large grain size and the ability to easily transmit water. In addition, the HPT system can collect profiles of static water pressure data, which can then be used to calculate static water levels. Interpretation in the field of the data collected during the HPT survey will be used to validate or reject probing at the pre-selected MIP locations. The HPT will be advanced with a Geoprobe drilling rig.

After interpretation of the HPT data in the field and optimization of the proposed MIP locations, Alisto proposes to then advance additional borings at each AOC with a Geoprobe drilling rig equipped with a membrane interface probe (MIP) in order to

assess the vertical extent of hydrocarbon impact. This will be performed during the same mobilization. Detectors proposed to be used are photo-ionization detector (PID), electron capture detector (ECD), and the flame ionization detector (FID). Detector information and the electrical conductivity of the soil are logged and graphed in the field continuously by a gas chromatograph and datalogger system. This allows the field geologist to determine the location and the relative concentration of the contaminant, and the soil in which the contaminant is located. The MIP data logs produced in the field will be reviewed during the work to determine if additional MIP borings should be performed during this proposed investigation and plume characterization.

In areas where the MIP tool detects hydrocarbon mass in soil, selected borings will be sampled continuously from ground surface to first saturated sediments for collection of confirmation samples for COC analysis in the laboratory.

Where grab groundwater samples are warranted to assess petroleum hydrocarbons in groundwater, the samples will be collected from the undeveloped borings. Once saturated sediments are encountered (estimated depth of > 10 feet bgs), an in-situ grab water sampling tool will be emplaced into the sediments ahead of the drill string. As warranted, grab water samples will also be collected from deeper zones for analysis of the COCs in selected borings. Clean Teflon tubing will be placed into the drill string and a grab groundwater sample will be collected using a peristaltic pump. In borings that do not readily produce groundwater, temporary casings will be placed in the open boring, and a grab sample will be collected using a clean disposable bailer. In selected borings, additional grab groundwater samples will be collected from depths of approximately 15 and 25 feet below first-encountered groundwater in an effort to characterize vertical extent of constituents of concern.

The grab water samples will be collected in clean laboratory-supplied containers, properly labeled and maintained in an iced cooler prior to transport to a state-certified laboratory for analysis under chain of custody.

Upon collection of sufficient sample volume for analysis of the constituents of concern, the borings shall be backfilled from the bottom to the surface using tremied neat cement.

Investigation beneath the existing active Shops Building is not warranted at this time since this building was constructed on an 8-inch thick (minimum) monolithic concrete slab underlain by a 10-mil vapor barrier. If findings of the proposed investigation indicate further assessment of indoor air exposure risk is warranted EBMUD will propose additional investigation and/or remediation measures in the investigation report.

Task 3: Analyze Grab Groundwater and Soil Samples

Selected soil and groundwater samples will be transported to a state-certified laboratory and analyzed for the following:

- TPH-G and BTEX using EPA Method 8260B
- TPH-D, and Total petroleum hydrocarbons as motor oil (TPH-MO) using EPA Method 8015M
- TOG using EPA Method 418.1/SM 5520
- MTBE and volatile organic compounds (VOC) using EPA Method 8260B

In AOC-3, selected soil and groundwater samples shall also be analyzed for California Assessment Manual (CAM 17) metals using EPA 6000 series Methods and semi-volatile organic compounds (SVOC) using EPA Method 8270C.

The samples will be analyzed on a standard 2-week turnaround time.

Task 4: Evaluate Laboratory Results and Prepare Report

On completion of sample analysis, a detailed evaluation of results and available information will be conducted to assess the nature and extent of constituents of concern in the soil and groundwater and determine the appropriate course of action. The data evaluation will include, but not be limited to the following:

- Interpretation of geologic and hydrogeologic characteristics of the water-bearing formation, and the nature and distribution of subsurface contamination.
- Preparation of cross-sections, and concentration maps of constituents of concern.
- Recommendation for monitoring and/or remediation wells or other remediation measures, if warranted.

A report presenting the results, findings, conclusions and recommendations of the above tasks will be prepared and submitted to the ACHCSA. The report will include analytical results, boring logs, cross-sections, constituent of concern contour maps as warranted, tabulated summary of analytical results, and sampling protocol and documentation.

3.0 HEALTH AND SAFETY PLAN

All field procedures and activities related to the site investigation will be conducted in accordance with a site specific Health and Safety Plan. The Health and Safety Plan will be developed in accordance with the applicable requirements of the California Environmental Protection Agency and the federal and state Occupational Safety and Health Administration.

REFERENCES

GEMS; 1994. Interim Remedial Action Summary Report for EBMUD Facility located at 1200 21stth Street, Oakland, California. December 29.

GeoPlexus; 1995. Preliminary Site Assessment Report for Adeline Maintenance Facility. March 2. September 12.

GeoPlexus; 1996. Materials Management Plan for East Bay Municipal Utility District Adeline Maintenance Center, 1200 21stth Street, Oakland, California. January 18.

GeoPlexus; 1996. Addendum No. 2 to Materials Management Plan for EBMUD Adeline Maintenance Facility, Oakland, CA. September 12.

GeoPlexus; 1997. Subsurface Investigation Report and Response to Agency Comments on Addendum No. 2 to Materials Management Plan for EBMUD Adeline Maintenance Facility, Oakland, CA. January 22.

GeoPlexus; 1998. Addendum No. 3 to Materials Management Plan for EBMUD Adeline Maintenance Facility, Oakland, CA. June 15.

GeoPlexus; 1998. Transmittal of Phase II Construction Materials Management Final Report for EBMUD Adeline Maintenance Center, Oakland CA. June 30.

GEMS; 1998. Tank Removal Summary Report for EBMUD Adeline Maintenance Facility, 1198 21st Street, Oakland CA. September 15.

FIGURES

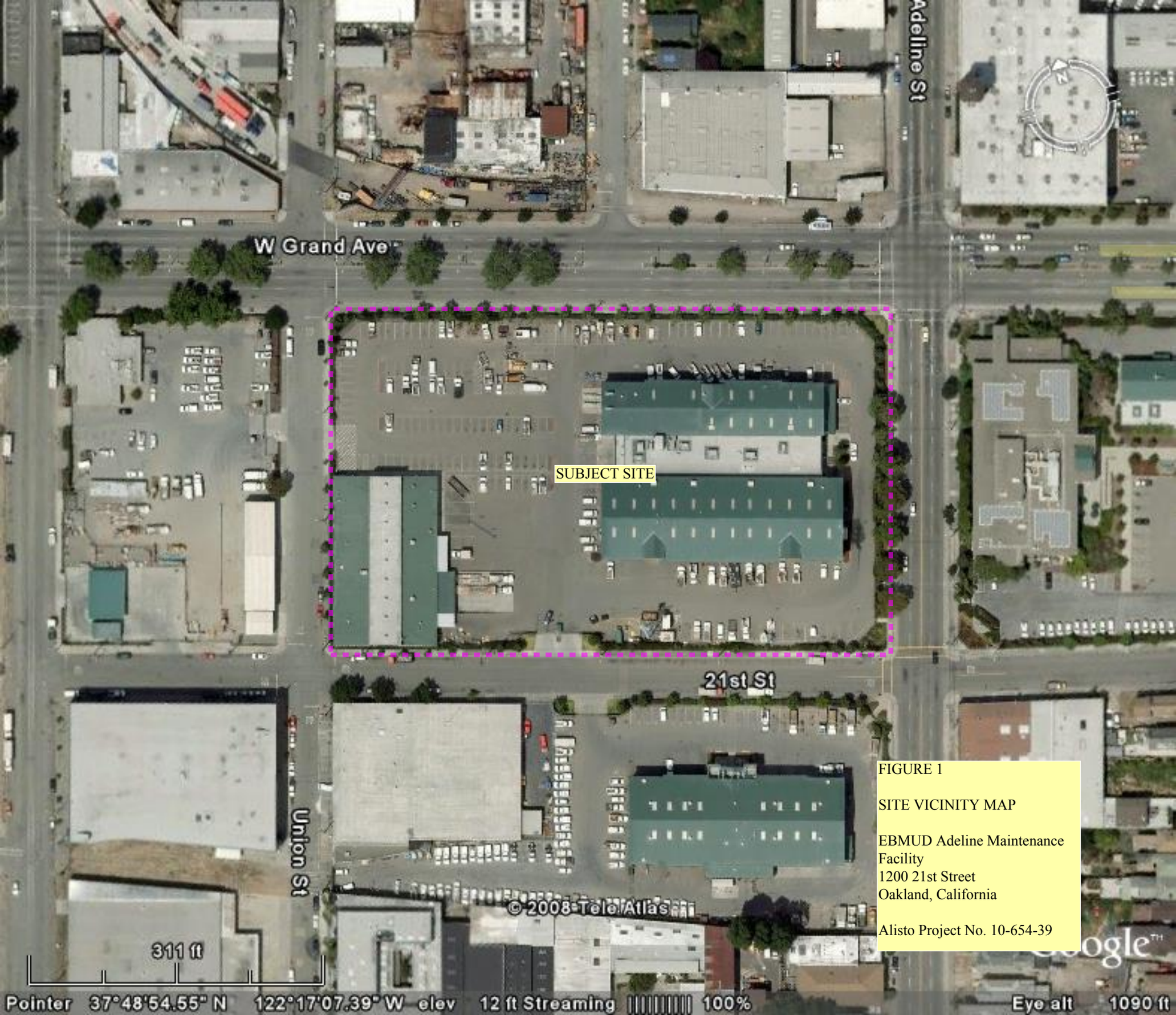

FIGURE 1

SITE VICINITY MAP

EBMUD Adeline Maintenance Facility
1200 21st Street
Oakland, California

Alisto Project No. 10-654-39

FIGURE 2
SITE LAYOUT &
AREAS OF CONCERN
EBMUD Adeline Maintenance Facility
1200 12th Street, Oakland CA

Alisto Project No. 10-654-39

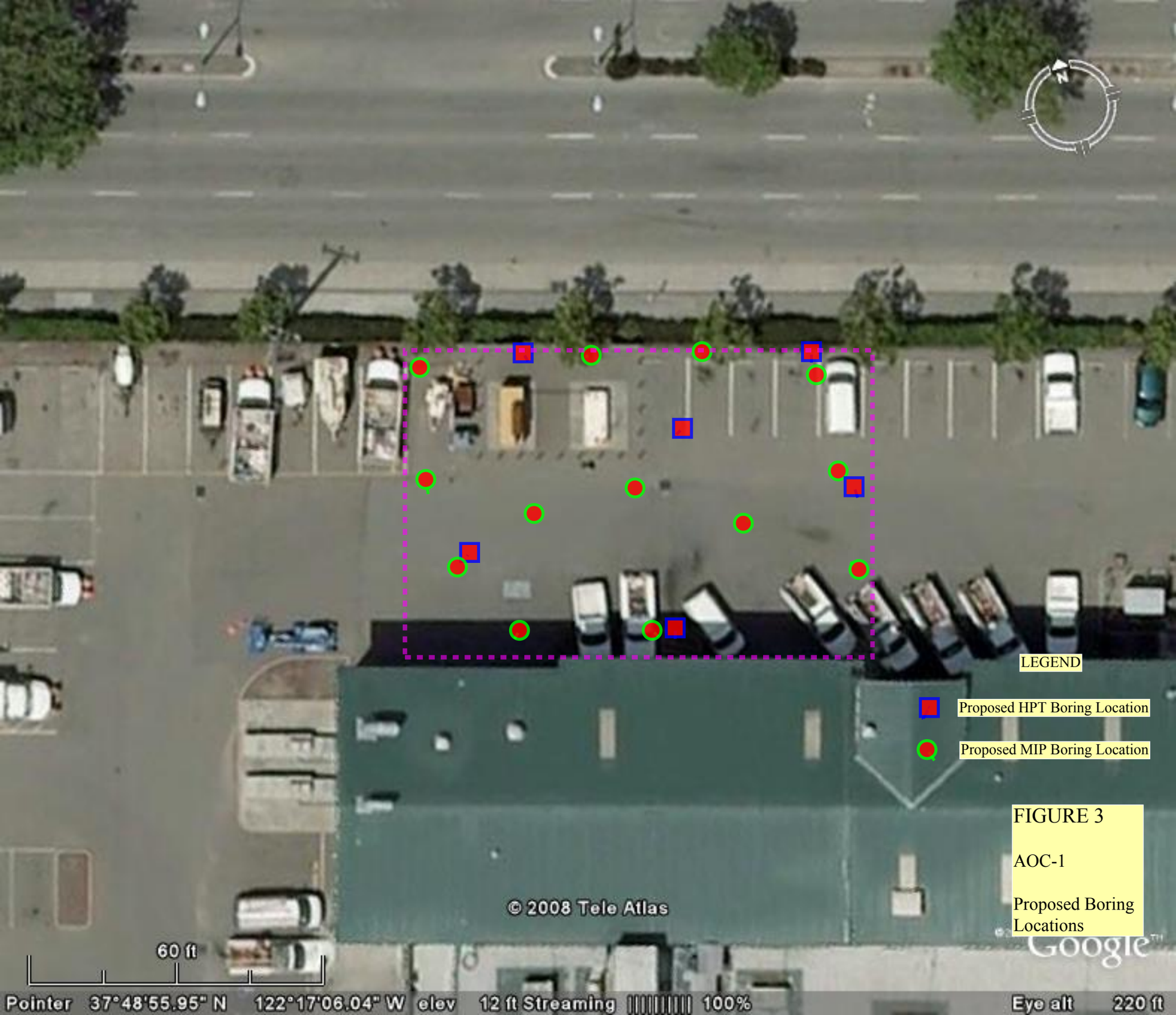

FIGURE 3

AOC-1

Proposed Boring Locations

FIGURE 4

AOC-2
Proposed Boring
Locations

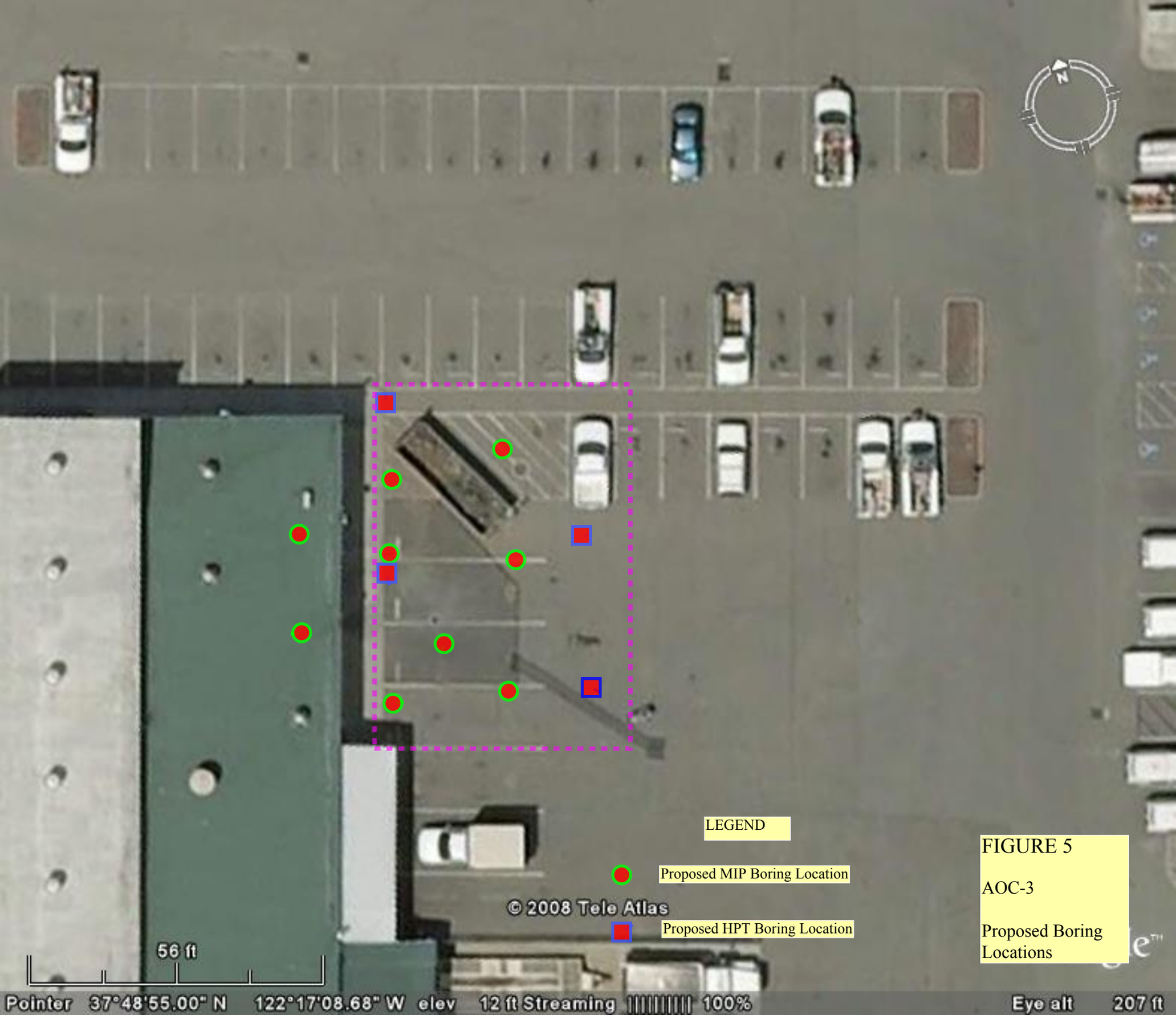

FIGURE 5

AOC-3

Proposed Boring Locations