February 11, 2011

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

**Reference:** ACEH Case No. RO0002959, Geotracker Global ID SLT19761201

**Subject**: Work Plan, 5901 MacArthur Blvd, Oakland, CA

Dear Mr. Wickham:

Attached is a Work Plan (February 11, 2011) prepared by OTG EnviroEngineering Solutions, Inc. for the site located at 5901 MacArthur Blvd, Oakland, California. Funding for the project has been provided in full or in part by the American Recovery and Reinvestment Act of 2009 (ARRA) and the Orphan Site Cleanup Fund (OSCF), through an agreement with the California State Water Resources Control Board.

**Certification**

*"I agree with the conclusions and recommendations presented in the attached document. I declare, under penalty of perjury, that the information and recommendations contained in the attached document is true and correct to the best of my knowledge".*

Please contact the undersigned at (510) 301-1600 if you have questions or comments.

Sincerely,

Jeffrey C. Huynh, Trustee
Huynh Cheng Family Living Trust
1501 Darius Court
San Leandro, CA 94577

OTG EnviroEngineering Solutions, Inc.

February 11, 2011

Mr. Jerry Wickham, PG, CEG, CHG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

**Reference:** ACEH Case No. RO0002959, Geotracker Global ID SLT19761201

**Subject**: Work Plan for Well Installation and Additional Shallow Soil Sampling
5901 MacArthur Blvd, Oakland, CA

Dear Mr. Wickham:

On behalf of the property owner – Huynh Cheng Family Living Trust, OTG EnviroEngineering Solutions, Inc. (OTG) is pleased to submit this *Work Plan* to Alameda County Environmental Health (ACEH) for well installation and additional shallow soil sampling at 5901 MacArthur Blvd, Oakland, California (Figure 1). This *Work Plan* is prepared in response to ACEH's request in a letter to the property owner dated January 12, 2011.

Because this project will be funded by the American Recovery and Reinvestment Act of 2009 (ARRA) and the State of California Orphan Site Cleanup Fund (OSCF), which require all investigation and remediation work be completed by May 15, 2011, your expedited review and approval of the *Work Plan* is greatly appreciated.

## BACKGROUND

A site assessment program was conducted in August 2010, which included drilling of 21 temporary boreholes up to 27.5 feet below ground surface (bgs) with a Geoprobe™ direct-push rig. A total of 85 soil samples were collected from the 21 boreholes for analyses of gasoline (TPH-g), diesel (TPH-d), motor oil (TPH-mo), benzene, toluene, ethyl benzene, & xylenes (BTEX), fuel oxygenates and additives (MTBE, TBA, DIPE, TAME, ETBE, EDB, & EDC). Seven of the 21 boreholes had groundwater and were sampled for groundwater analyses of the same chemicals as for soil samples. Figure 2 illustrates boring locations. The results were documented in a *Site Assessment Report* (OTG, December 2010).

The August 2010 investigation identified TPH-g in soil and groundwater samples at concentrations up to 860 mg/kg and 11,000 ug/L, respectively. TPH-d was detected in soil and groundwater samples at concentrations up to 740 mg/kg and 9,100 ug/L, respectively. Based on the investigation results, ACEH concurred with the Report recommendation that monitoring wells be installed near seven soil borings. Locations of proposed wells are shown on Figure 3.

## PROPOSED WELL INSTALLATION PROCEDURES

A groundwater monitoring well will be installed within three feet of each of the following six boreholes: NW-1, NW-2, NW-4, NW-6, NW-9, and SB-5. Per ACEH recommendation, a seventh well (NMW-7 on Figure 3) will be installed near the property boundary and east of borehole TB-1.

Specific details of well installation are outlined below:

- Pre-drilling details include: developing a site health and safety plan; obtaining well construction permits from Alameda County Public Works Agency Water Resources Section; and underground utility clearance (contacting Underground Services Alert [USA], and contracting to an independent utility locator to clear proposed locations).
- The well borings will be drilled with a hollow stem auger rig (8-inch diameter for 2-inch diameter wells and 10-inch auger for 4-inch wells), from which continuous cores of soil columns (using a 5-foot long core barrel) will be collected and logged by an onsite geologist or civil engineer.
- NMW-3, NMW-6, NMW-7, and NMW-9 are located near property boundary and will be likely used for monitoring purposes only. These four wells, therefore, will be constructed with 2-inch diameter, Schedule 40 PVC piping. NMW-1, NMW-2, and NMW-4 are located within the area where potential remediation may be necessary, and thus they will be constructed with 4-inch diameter, Schedule 40 PVC piping. Groundwater was measured at approximately 14 to 15 feet bgs in the August 2010 investigation. The wells will be installed to 23 feet bgs and will be screened from 10 feet to 23 feet bgs. Table 1 presents a summary of well details.
- Except NMW-7, soil samples will not be collected from the other six wells for chemical analysis as the wells are located within three feet of the August 2010 boreholes, from which soil samples were collected and analyzed. For NMW-7, soil samples from five feet intervals or as selected by the onsite geologist based on field observations will be collected and submitted to a State of California certified environmental analytical laboratory under chain-of-custody protocols for analysis of BTEX, EDB, EDC, five fuel oxygenates, TPH-g, TPH-d & mo.
- The wells will be constructed and finished in typical fashion in accordance with local and state well regulations. The wells will be constructed with Schedule 40 PVC material and with flush threaded and factory slotted screen. The screen slot size is expected to be 0.01-inch with a Lonestar 2/12 (or equivalent) sand pack. The sand pack will extend one foot above the top of the uppermost screen slots, followed by one foot of hydrated bentonite chips and then neat cement/bentonite grout to land surface. The wells will be completed to grade with lockable wellhead in traffic rated bolted well boxes.

- After a minimum of 72 hours of completion the monitoring wells will be developed with surge blocks and bailers, followed by pumping until the well water clears and water quality parameters of pH, conductivity, temperature and turbidity stabilize.
- All wells will be surveyed with respect to northing and easting location (NAD 1983 datum) and elevation above mean sea level (msl, NAVD 1988 datum). Survey points will be flush mounted traffic box rim and the top of PVC well casing for each well.
- Initial well sampling will be done no earlier than 48-hours after completion of well development. At that time the wells will be sampled and submitted to a state certified environmental laboratory for the analysis of BTEX, EDB, EDC, five fuel oxygenates, TPH-g, TPH-d & mo. The groundwater monitoring events will be preceded with a water level survey to establish depth to water, water surface elevation (flow direction and gradient), and calculation of the wetted well casing volume that will need to be removed (typically 3 to 5 wetted casing volumes) prior to collecting a representative groundwater sample.
- Soil cuttings and decontamination, well development and purge water will be stored in a central on-site location in properly labeled DOT approved 55-gallon drums awaiting final disposal option selection.

A well installation report will be prepared and submitted to ACEH. The report will document well installation activities and groundwater monitoring results.

**PROPOSED ADDITIONAL SHALLOW SOIL SAMPLING**

In the August 2010 investigation soil samples were generally collected at 5 feet intervals from the 21 boreholes for chemical analyses. Of the 36 shallow soil samples (0 to 10 feet bgs) analyzed, only two samples collected from 5 feet bgs had TPH-d and TPH-mo concentrations exceeded their respective residential Environmental Screening Levels (ESLs): NW-8-5 (340 mg/kg TPH-d and 1,700 mg/kg TPH-mo) and ASB-6-5 (140 mg/kg TPH-d and 890 mg/kg TPH-mo). TPH-d and TPH-mo in shallow soil are not wide spread and thus may not indicate poor quality of fill materials throughout the site. Concentrations of TPH-g, BTEX, and fuel oxygenates and additives in the 36 shallow soil samples were all below their respective residential ESLs.

The TPH-d and TPH-mo detected in shallow soil at the two isolated locations could be related to past site activities, i.e. automobile maintenance services. In order to define the extent of the contamination, five additional borings are proposed. As shown on Figure 3, two of the five borings are located near NW-8 and the other three are located near ASB-6. Sampling procedures are as follows:

- Pre-drilling details include: developing a site health and safety plan; obtaining a soil boring permit from Alameda County Public Works Agency Water Resources Section; and

underground utility clearance (contacting Underground Services Alert [USA], and contracting to an independent utility locator to clear drilling locations).

- The soil borings will be drilled with a direct-push rig (Geoprobe or equivalent) to 10 feet bgs, from which continuous cores of soil columns will be collected and logged by a registered geologist or civil engineer.
- Soil samples will be collected at 2, 5, and 10 feet bgs from each borehole and will be submitted to a State of California certified environmental analytical laboratory under chain-of-custody protocols for TPH-d and TPH-mo analyses by modified EPA 8015 Method.
- At the end of each day drilling, all boreholes will be backfilled with neat cement/bentonite grout from total depth to land surface following the County borehole sealing requirements.
- Soil cuttings and decontamination water will be stored in a central on-site location in properly labeled DOT approved 55-gallon drums, pending for off-site disposal.

The soil investigation results will be included in the well installation report, which will be submitted to ACEH.

**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".*

Please contact the undersigned at (510) 465-8982 if you have questions or comments.

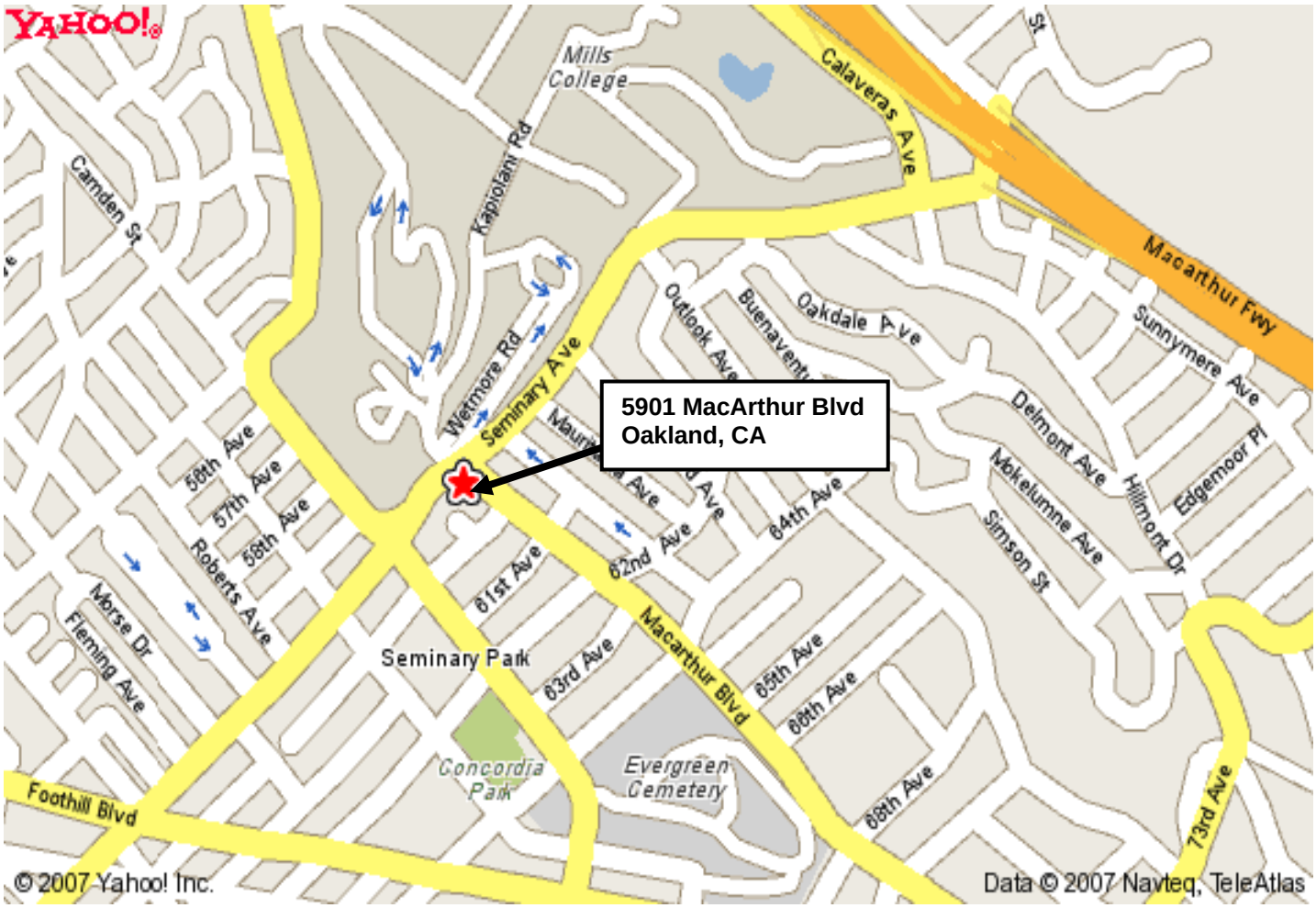
Sincerely,
***OTG EnviroEngineering Solutions, Inc.***


Xinggang Tong, PhD, PE
Project Manager

cc: Jeffrey Huynh, 1501 Darius Ct, San Leandro, CA 94577

Attachments:

Figure 1 – Site Location Map
Figure 2 – Site Plan & August 2010 Boring Locations
Figure 3 – Site Plan & Proposed Boring & Well Locations
Table 1 – Details of Proposed Monitoring Wells

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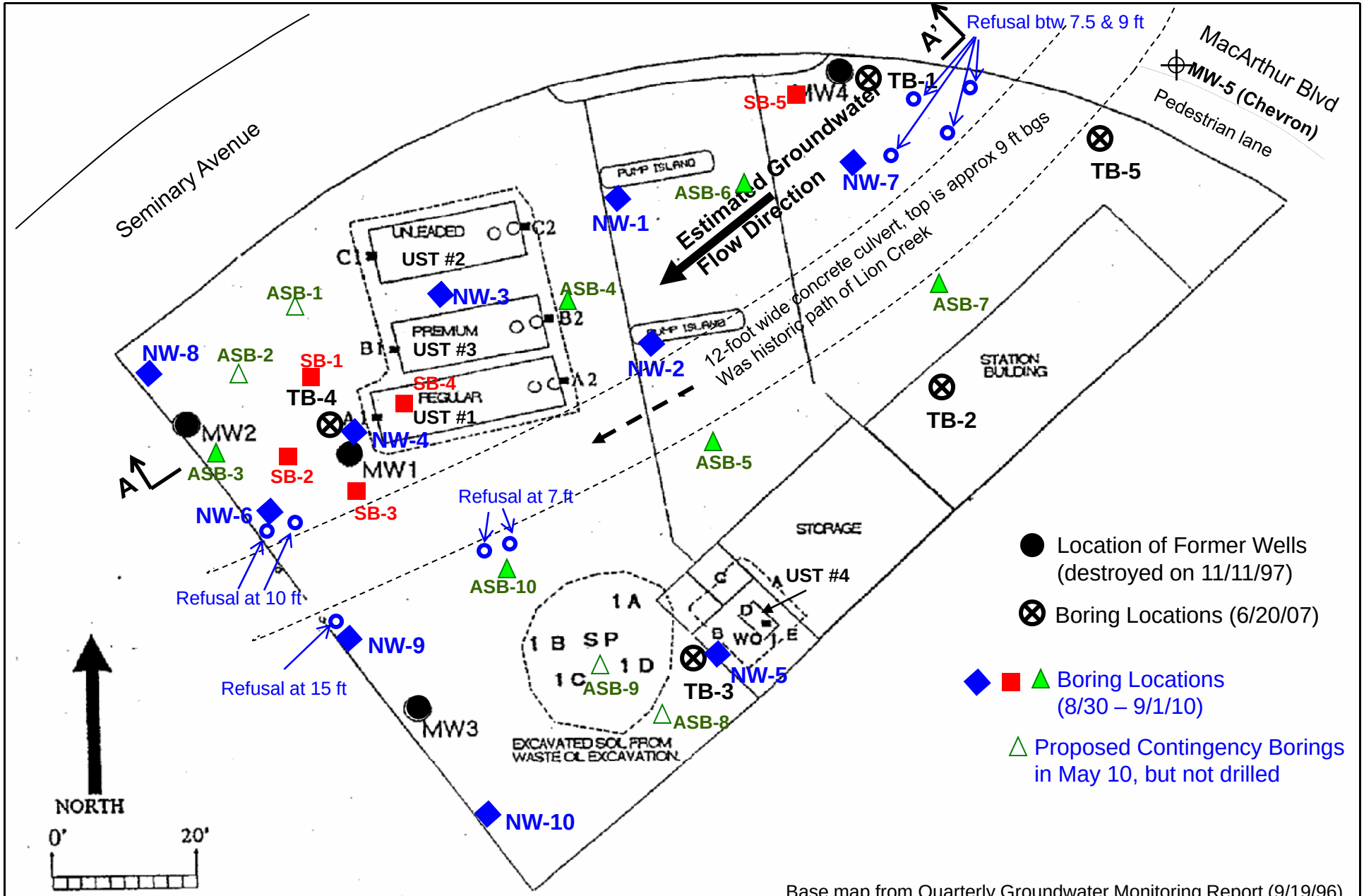
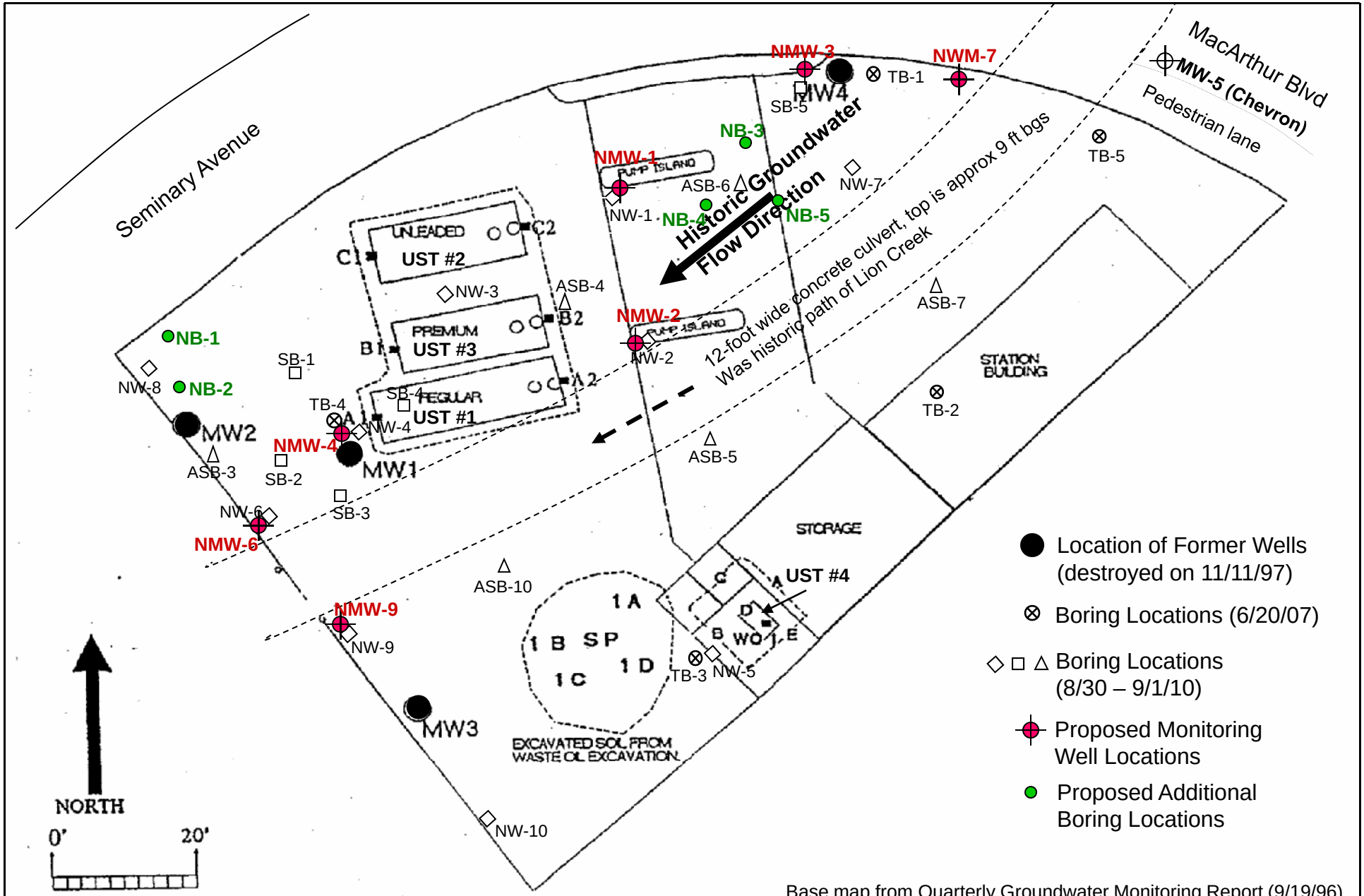
| PROJECT NO. 10HCT02 | 5901 MacArthur Blvd Oakland, CA | SITE LOCATION MAP | FIGURE 1 |
|---|---|---|---|
| OTG EnviroEngineering Solutions Inc. | | | |




October 11, 2010

Base map from Quarterly Groundwater Monitoring Report (9/19/96)
By Western Geo-Engineers

| | | | |
|---|---|---|---|
| **PROJECT # 10HCT02** | **5901 MacArthur Blvd Oakland, CA** | **SITE PLAN & BORING LOCATIONS** | **FIGURE 2** |
| OTG EnviroEngineering Solutions, Inc. | | | |




Base map from Quarterly Groundwater Monitoring Report (9/19/96)
By Western Geo-Engineers

February 11, 2011

| PROJECT # 10HCT02 | 5901 MacArthur Blvd<br>Oakland, CA | SITE PLAN & PROPOSED<br>BORING & WELL LOCATIONS | FIGURE 3 |
|---|---|---|---|
| OTG EnviroEngineering Solutions, Inc. | | | |

**Table 1 - Details of Proposed Monitoring Wells**
**5901 MacArthur Blvd, Oakland, CA**

| Well ID | Well Diameter | Total Depth | Screen Interval | Screen Size | Well Material | Borehole Dia. | Sand Packing | Sand Type |
|---|---|---|---|---|---|---|---|---|
| | (inches) | (feet) | (feet, bgs) | (inches) | | (inches) | Interval (ft, bgs) | (Lonestar or eq) |
| | | | | | | | | |
| NMW-1 | 4 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 10 | 9 - 23 | #2/12 |
| NMW-2 | 4 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 10 | 9 - 23 | #2/12 |
| NMW-3 | 2 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 8 | 9 - 23 | #2/12 |
| NMW-4 | 4 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 10 | 9 - 23 | #2/12 |
| NMW-6 | 2 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 8 | 9 - 23 | #2/12 |
| NMW-7 | 2 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 8 | 9 - 23 | #2/12 |
| NMW-9 | 2 | 23 | 10 - 23 | 0.01 | Sch 40 PVC | 8 | 9 - 23 | #2/12 |
| | | | | | | | | |
| | | | | | | | | |
| Note: | | | | | | | | |
| One foot hydrated bentonite chips on top of sand packing and then cement grout to surface, | | | | | | | | |
| complete well with lockable wellhead in a traffic rated bolted well box. | | | | | | | | |