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& ASSOCIATES

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May 28, 2008

Mr. Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Remedial Action Plan**
Former Shell Service Station
2703 Martin Luther King Jr. Way
Oakland, California
SAP Code 129449
Incident No. 97093397

Dear Mr. Wickham:

Conestoga-Rovers & Associates (CRA) prepared this *Draft Remedial Action Plan* on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). CRA prepared and submitted a February 5, 2008 *Site Conceptual Model and Feasibility Study/Corrective Action Plan* (February 2008 SCM/FS/CAP) which was approved by the Alameda County Health Care Services Agency (ACHCSA) in their February 28, 2008 letter to Shell. The ACHCSA agreed to onsite excavation followed by bio-sparging as the most appropriate remedial recommendation to address subsurface hydrocarbon impacts. Details for the recommended remedial option are below.

SITE LOCATION AND DESCRIPTION

The site is a former service station located on the northwest corner of Martin Luther King Jr. Way and 27th Street in a commercial and residential area of Oakland, California (Figures 1 and 2). A Shell service station operated on the property from approximately 1959 to 1979. Currently, the site is occupied by ATW and is utilized as an automotive repair shop.

A summary of previous work performed at the site and additional background information was presented in the February 2008 SCM/FS/CAP.

REMEDIAL ACTION PLAN

As detailed in the February 2008 SCM/FS/CAP, excavation with dewatering followed by bio-sparging is the chosen remedial option. Based on historical soil analytical data for the site and established Environmental Screening Levels (ESLs), CRA proposes the excavation limits shown on Figure 2. This

excavation will require shoring to excavate hydrocarbon impacted soil to approximately 20 feet below grade (fbg). The use of shoring will not allow for sidewall samples to be collected.

Depending on the extent of impacts observed in the field, additional excavation may be warranted to remove hydrocarbon-impacted soils. However, additional excavation may not be feasible due to safety restrictions and proximity to above-ground structures. Field observations and confirmatory sampling will dictate the actual extent of the excavation limits. The areas proposed for excavation are limited to the site, and no offsite excavation is proposed. Multiple underground utilities have been identified onsite during a previous subsurface utility survey, and they will be removed and replaced, if necessary. The previous subsurface survey also identified possible vapor lines associated with the former underground storage tank (UST) fueling system, which will also be removed during the excavation.

The work tasks described below include tasks related to the installation of proper shoring, excavation; proper well destruction; soil segregation; soil profiling; groundwater extraction (if necessary); soil sampling; proposed reuse of backfill material; backfill and compaction; soil disposal; well replacement (if required); and reporting.

Work Tasks

Contractor Retention: Shell will sole-source the excavation work to one of its direct-bill contractors.

Permits: CRA will obtain well destruction permits from the ACHCSA and provide all required notifications for the well destructions activities. The excavation contractor will acquire all the required permits and provide all the required notifications for the excavation activities.

Utility Location: For the well destruction activities, CRA will notify Underground Services Alert (USA) to identify and clear utilities in the vicinity. The excavation contractor will also be required to clear utilities via USA and a private utility line locator prior to excavating. CRA has previously contracted with a private utility locating company which identified possible underground utilities remaining onsite, that may have to be either re-routed temporarily and/or replaced after the excavation. As noted above, what is believed to be the former fuel systems vapor lines will be removed during excavation, if present.

Site Health and Safety Plan: For well destructions and excavation oversight, CRA will prepare a comprehensive site safety plan to protect CRA site workers, inspectors, and the public. The plan will be reviewed and signed daily by each site worker and kept onsite during field activities. The excavation contractor will be required to have their own safety plan to protect their site workers, inspectors, and the public.

Well Abandonment: To complete excavation activities, five wells (MW-4 to MW-8) and one vapor probe (V-1) will have to be destroyed according to local regulatory requirements. All well destruction activities will be performed under the supervision of a state of California Professional Geologist. Since these wells are located within the proposed excavation footprint and completed to depths ranging from 13 to 20 fbg, the wells will be destroyed by excavation and reported to the appropriate agencies.

Excavation: CRA proposes to excavate and dispose of hydrocarbon-impacted soil as shown on Figure 2. The excavation limits will be contained onsite to a maximum depth of 20 fbg. Due to the surrounding facilities, including a neighboring building to the west and an onsite building to the east, this work will require appropriate shoring. Also, the onsite building currently has a wooden frame car port which will have to be removed and replaced. Additional exploratory excavation may occur beyond the proposed limits based on field indicators, to verify the absence of or remove hydrocarbon-impacted soil, if present. If additional impacts are observed beyond the proposed excavation limits, the impacts to soil will be removed until site constraints, including cost-effectiveness or safety concerns, make it infeasible.

Shoring: Based on the current information available, CRA believes that it is appropriate to excavate the areas using shoring. To remove the soil to approximately 20 fbg, protect the adjacent structures and any subsurface utilities, the excavation area will require shoring. Due to the shallow depth of groundwater at the site (4-10 fbg), interlocking or appropriate shoring to reduce the amount of groundwater infiltration is suggested.

Confirmation Sampling: If the base of the shored excavation has standing groundwater, no soil samples will be collected from the saturated zone due to the potential for gasoline constituent concentrations in groundwater to adversely affect actual soil conditions. Sidewall sampling will not be possible due to the presence of shoring. Historical soil sampling data clearly defines the extent of impact at the site. If no standing groundwater is present at the base of the excavation (20 fbg), grab soil samples will be collected, including a minimum of one sample from near each sidewall.

Reuse of Backfill Materials: To control costs of disposal and import of compactable fill material, CRA proposes to reuse any segregated clean overburden or fill material that meets compactable reuse criteria. Due to normal construction processes, it is anticipated that some native impacted material will be mixed in with the former backfill material during the excavation process; however, a CRA representative will be on-site to direct the excavation contractor, screen, and segregate to the extent feasible the clean material from impacted material, and to document the field activities and observations.

Groundwater Extraction: The main purpose of the proposed excavation is to remove elevated gasoline-constituent concentrations remaining in soil. An added benefit of excavation is the potential to readily remove non-aqueous phase and dissolved phase hydrocarbons from shallow groundwater by groundwater extraction from the open excavation. A holding tank will be mobilized for groundwater storage as the project progresses. CRA will either oversee the off-haul and disposal of hydrocarbon impacted groundwater, or a dewatering system may be mobilized and set-up to extract, treat and dispose under permit, treated groundwater to the local sanitary agency. If present, grab groundwater samples will be collected at the completion of excavation and prior to backfilling, if feasible. Additional samples may need to be collected for groundwater profiling and disposal/discharge requirements. These will be dictated by the disposal process, either by off haul or sanitary discharge. If required, a groundwater discharge report will be forwarded to the appropriate agencies and a copy included in the final report.

Backfill and Compaction: Upon completion of the excavation and groundwater extraction, the excavation will be backfilled and compacted. Self-compacting or compactable type materials will be placed as necessary to return the site conditions to preconstruction grade. If a compaction report is required, it will be provided and reported accordingly. If required, the site will be restored to the preconstruction condition.

Chemical Analyses: Soil and groundwater samples collected from this site will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) and BTEX by EPA Method 8260B. Fuel oxygenates are not considered a constituent of concern at this site. For proper soil and groundwater disposal, additional analysis will be required, as directed by the disposal facility or agency.

Soil Disposal: Excavated soil and replacement well spoils will be profiled, manifested, transported, and disposed of according to all federal and state regulations. Documentation support of disposal will be provided with the final report.

Well Replacement: The ACHCSA may require installation of replacement wells. Recommendations for well replacement will be included in the excavation summary report discussed below.

Report Preparation: CRA will prepare a report of findings summarizing well destruction and excavation activities for submittal to the ACHCSA. This report will include a discussion of excavation activities, dewatering, backfill, compaction (if required), well replacement recommendations, and spoils disposal. The document will also include the post-excavation monitoring program for the site.

Bio-Sparge System

During and following excavation, CRA will install of a simple bio-sparge curtain to assist biodegradation of the downgradient dissolved-phase hydrocarbon plume. The bio-sparge curtain would consist of a series of injection wells installed within the excavation's backfill material. Bio-sparging will occur within the backfill material with the intent of dispersing dissolved oxygen through downgradient native soils at approximately 15 fbg, which is the most-likely migration pathway for dissolved-phase impacts.

Permits: CRA will obtain drilling permits from the ACHCSA.

Health and Safety Plan (HASP): CRA will prepare a HASP for field work.

Utility Clearance: CRA will mark the proposed drilling locations, and the locations will be cleared through Underground Service Alert and a private line locator service prior to drilling.

Injection Point Installation and Construction: 6 injection wells (AS-1 through AS-6) are proposed at the locations shown on Figure 2. The injection point borings will be drilled using 6-inch diameter hollow-stem auger equipment and will be converted to injection points. The injection points are located along the western property line and placed at 15-foot spacing.

No logging or sample collection will occur during installation of these injection points as the are being constructed in the clean excavation fill material. The injection points will be constructed using 2-inch diameter Schedule 40 PVC casing with a screened interval of approximately 13 to 15 fbg (with 0.010-inch slotted PVC) and a 5-foot sump below the screened interval. The filter pack of #00 silica sand (or equivalent) will be placed from the bottom of the injection point to 1 foot above the screen, followed by a 2-foot thick bentonite seal, with the remainder of the well annulus filled with a bentonite-cement grout to grade. The injection points will be secured with a locking cap under a traffic-rated well box until bio-sparge wellhead connections are completed.

The oxygen injection points will be installed under the supervision of a Professional Geologist or Engineer.

Injection Point Development: Blaine Tech Services, Inc. will develop the new injection points no sooner than 72 hours after the points have been completed.

Wellhead Survey: A licensed surveyor will survey the wellhead elevations relative to mean sea level and the injection points' latitude and longitude.

Equipment Installation and Operation

Permits: CRA will obtain permits from the City of Oakland as necessary to install the bio-sparge system.

HASP: CRA will prepare a comprehensive HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each worker and all visitors to the site during construction activities.

Equipment Installation: An Ingersol-Rand rotary screw air compressor will be used to deliver air to the injection points. A bio-sparge manifold with air solenoid valves and an electrical control panel will be used to pulse air into the injection wells at preset intervals. Oxygen will be conveyed to the wells via separate 1-inch diameter high-density poly-ethylene (HDPE) flexible piping. Rotameters and pressure gauges will be installed to monitor air delivery to each injection point.

Operation: During start-up, oxygen will initially be pulsed at approximately 2 scfm per injection point for 1 hour every 4 hours. DO concentrations in adjacent monitoring wells will be monitored with the intent to reach at least 3 milligrams per liter (mg/L). If this DO level is not achieved, pulsing will be increased until the minimum DO criterion is met or until the operating limits of equipment are reached. Once the minimum DO is achieved, CRA will attempt to optimize the system so that a DO concentration of approximately 10 to 12 mg/L is achieved/maintained in adjacent wells.

Data Collection and Optimization: CRA anticipates conducting monthly operation and maintenance site visits for the system. Data will be collected on site-specific standard forms. During each site visit, CRA will record operating parameters (injection pressure and flow rate) and perform maintenance of mechanical parts as necessary. CRA will also measure depth to water, DO concentrations, and oxidation-reduction potential in the injection points and proximal monitoring wells. Percent of oxygen saturation will also be either measured directly from available instrumentation or calculated from the depth to water and DO measurements. In addition, temperature, conductivity, and pH will be measured quarterly in the injection points and well.

Sample Collection: Baseline groundwater samples will be collected prior to system start-up and semi-annually thereafter from the injection points and proximal wells.

System Evaluation: A review of the system performance will be conducted quarterly after start-up. Results of these remediation activities will be used to determine if the system is effectively enhancing

bio-degradation of dissolved-phase hydrocarbons. Results of the quarterly evaluations will be summarized in the quarterly groundwater monitoring reports.

CLOSING

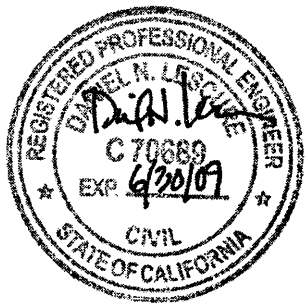
If you have any questions regarding this document, please contact Jacquelyn England at (707) 933-2370.

Sincerely,

Conestoga-Rovers & Associates

Jacquelyn L. England

Daniel N. Lescure, P.E.



Figures: 1 – Vicinity Map
2 – Proposed Limits of Excavation

cc: Denis Brown, Shell Oil Products US
Rodney & Janet Kwan, property owners of subject site
Monique Oates, property owner at 670 27th Street in Oakland
Scott Merillat, property owner at 664 27th Street in Oakland

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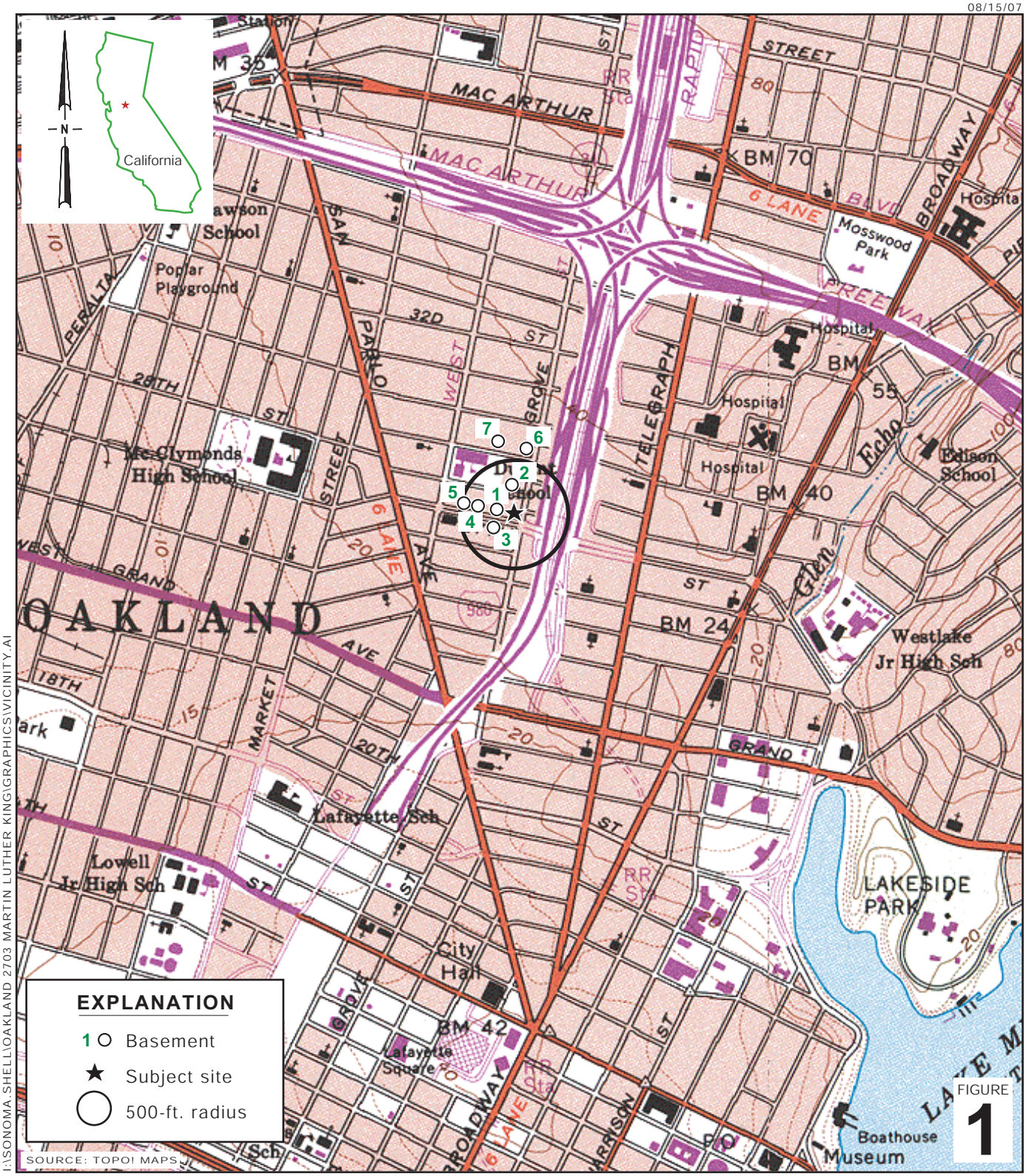

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FIGURE 1

0 1/8 1/4 1/2 1

SCALE (MILES)

Former Shell Service Station
2703 Martin Luther King Jr. Way
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

01/11/08

Vacant Lot
2727-29 Martin Luther King

MW-12
21.26
(ND)
(ND)

A.G. W/O
AST

MW-8
20.40
(42,000)
(4,900)

anode

former
vent
lines

BUILDING

MW-7
20.32
(26,000)
(3,000)

TRENCH

Wooden
Carport

MW-1
21.65
(NA)
(NA)

GATE

DRIVEWAY

MW-5
20.34
(61,000)
(7,500)

former dispensers

V-1
20.42
(74,000)
(1,300)

former USTs

MW-6
20.28
(7,000)
(850)

MW-14
18.88
(32,000)
(1,600)

V-2
20.40
(2,000)
(19)

former
dispensers

MW-4
20.30
(6,400)
(1,400)

DRIVEWAY

MW-2
19.90
(NA)
(NA)

MW-3
19.89
(NA)
(NA)

GATE

DRIVEWAY

DRIVEWAY

MARTIN LUTHER KING JR. WAY

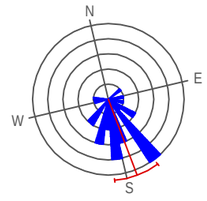
27TH STREET

EXPLANATION

MW-12	●	Monitoring well location (2/06)
MW-6	●	Monitoring well location (1/06)
MW-3	●	Monitoring well location (11/00)
MW-1	●	Monitoring well location (7/96)
V-1	◭	Soil vapor well location (7/96) (not used for contouring)
		Proposed Excavation Limits Depth = 20 fbg
-23.53		Groundwater elevation, in feet above msl
(ND)		TPHg concentration in µg/L
(1,600)		Benzene concentration in µg/L

Notes:
ND = Not detected
NS = Not sampled

AS-1	⌖	Proposed bio-sparge well
		Proposed underground bio-sparge pipe



Groundwater Flow Direction
(2Q00 through 1Q07)

0 10 20 40
Scale (ft)

Basemap from Virgil Chavez Land Surveying and Alameda County Assessors Parcel Map

Proposed Excavation Limits

January 11, 2008

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Former Shell Service Station
2703 Martin Luther King Jr Way
Oakland, California

FIGURE
2

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