ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
COLLEEN CHAWLA, Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP)
For Hazardous Materials Releases
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

August 29, 2018

Ms. Susan Kirkpatrick
Greyhound Lines, Inc.
c/o FirstGroup America, Inc.
600 Vine Street, Suite 1400
Cincinnati, OH 45202
(Sent via electronic mail to: Susan.Kirkpatrick@firstgroup.com)

Subject: Work Plan Request; Fuel Leak Case No. RO0000074 and GeoTracker Global ID T0600100666, Oakland Bus Terminal, 2103 San Pablo Avenue, Oakland, CA 94608

Dear Ms. Kirkpatrick:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file for the subject site including the *Groundwater Monitoring Report,* and the *Subsurface Investigation and Soil Vapor Sampling Report,* both dated May 24, 2018. The reports were prepared and submitted by Green Star Environmental (Green Star) on your behalf. Thank you for submitting them.

The subsurface investigation report documented the installation of soil bores B-13 to B-22 and soil vapor wells SV-3 to SV-6, and the collection of soil and soil vapor samples for analysis. The analytical results for soil documented concentrations up to 11,000 milligrams per kilogram (mg/kg) Total Petroleum Hydrocarbons as gasoline (TPHg), 1,900 mg/kg TPH as diesel (TPHd), 1.2 mg/kg benzene, 13 mg/kg ethylbenzene, and 14 mg/kg naphthalene at depths greater than 10 feet below grade surface (bgs). Analytical concentrations for benzene, ethylbenzene, and naphthalene in the 0 to 5 and 5 to 10 foot depth intervals were less than approximately 0.0016 mg/kg; however, combined TPHg and TPHd at SV-6 was 200 mg/kg at a depth of 4.5 feet.

Soil vapor concentrations at a depth of 6 feet bgs were reported up to 11,000 micrograms per cubic meter (µg/m^3) benzene, less than 2,000 µg/m^3 ethylbenzene and naphthalene. Concentrations of TPHg were reported up to 25,000,000 µg/m^3. Oxygen was detected between 0.48 and 1.3 percent (%), carbon dioxide was detected at 13 to 15%, and methane was detected between 5.4 and 13%, and at each location is within the explosive range defined by the Lower and Upper Explosive Limit (LEL and UEL, respectively) of approximately 5.4 and 15%.

ACDEH has evaluated the data and recommendations presented in the above-mentioned reports, in conjunction with the case files, to determine if the site is eligible for closure as a low risk site under the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP). Based on ACDEH staff review, we have determined that the site fails to meet the LTCP General Criteria f (Secondary Source Removal) and the Media-Specific Criteria for Groundwater, the Media-Specific Criteria for Vapor Intrusion to Indoor Air, and the Media-Specific Criteria for Direct Contact (see Geotracker).

Based on ACDEH staff review of the case file, we request that you address the following technical comments and send us the reports described below.

TECHNICAL COMMENTS

1. **General Criteria f – Secondary Source Has Been Removed to the Extent Practicable –** "Secondary source" is defined as petroleum-impacted soil or groundwater located at or immediately beneath the point of release from the primary source. Unless site attributes prevent secondary source removal (e.g. physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible), petroleum-release sites are required to undergo secondary

source removal to the extent practicable as described in the policy. "To the extent practicable" means implementing a cost-effective corrective action which removes or destroys-in-place the most readily recoverable fraction of source-area mass. It is expected that most secondary mass removal efforts will be completed in one year or less. Following removal or destruction of the secondary source, additional removal or active remedial actions shall not be required by regulatory agencies unless (1) necessary to abate a demonstrated threat to human health or (2) the groundwater plume does not meet the definition of low threat as described in this policy.

Secondary source or potentially residual contamination is predominantly documented between the depth of 10 feet and groundwater (approximately 17 to 19 feet bgs) and continues to degrade groundwater, and potentially soil vapor (see technical comments below), at the site. While elevated residual contamination appears to be predominately deeper than approximately 10 feet bgs, the lateral extent of soil has not been defined to the northwest, north, east, southeast, and south. This is an important consideration at the site due to the degradation of groundwater, the full area intended for remedial action treatment, and due to elevated soil vapor concentrations (see below).

2. **LTCP Media Specific Criteria for Groundwater –** To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites listed in the policy.

   Our review of the case files indicates that insufficient data collection and analysis has been presented to support the requisite characteristics of plume stability or plume classification as follows:

   a. **Length of Groundwater Plume and Sensitive Receptor Survey –** In an effort to determine the likelihood and location of sensitive receptors that could be exposed to groundwater contamination within 1,000 feet of a potential groundwater plume of maximum length as determined by technical justification papers associated with the LTCP, the May 12, 2017 proposed to conduct a sensitive receptor survey, including a water well survey and a survey for dewatering structures. To date this has not been conducted and is overdue.

3. **LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air –** The LTCP describes conditions, including bioattenuation zones, which if met will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to human occupants of existing or future site buildings, and adjacent parcels. Appendices 1 through 4 of the LTCP criteria illustrate four potential exposure scenarios and describe characteristics and criteria associated with each scenario.

   a. **Vapor Analytical Data -** Our review of the case files indicates that the site data collection and analysis due not meet any of the four scenarios of the LTCP. Specifically, the detection of oxygen at concentrations below 4% (0.48 to 1.3%) in all vapor samples, the recent (February 27, 2018) detection of concentrations of benzene in groundwater up to 720 micrograms per liter (µ/l) beneath the site, combined TPHg and TPHd concentrations greater than 100 mg/kg (up to 200 mg/kg) in at least one location (SV-6) close to the onsite building, indicates the site fails both the low concentration scenarios (Scenario 3), and the direct measurement of soil vapor concentrations (Scenario 4) conditions.

   b. **Active Microbial Community –** As indicated above, methane concentrations are within the explosive range defined by LEL and UEL conditions. Elevated concentrations of carbon dioxide in combination with methane and low oxygen concentrations indicate active biodegradation of the petroleum hydrocarbon contamination beneath the site.

4. **LTCP Media Specific Criteria for Direct Contact and Outdoor Air Criteria** – The LTCP describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. According to the policy, release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and

shall be considered low-threat if the maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth bgs. Alternatively, the policy allows for a site specific risk assessment that demonstrates that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health, or controlling exposure through the use of mitigation measures, or institutional or engineering controls.

Our review of the case files indicates that insufficient data collection and analysis has been presented to satisfy the media-specific criteria for direct contact and outdoor air exposure. Specifically, due to the former presence of a waste oil UST in the tank complex, analysis for poly-aromatic hydrocarbons (PAHs) are required to be analyzed from a sample within the 0 to 5 foot depth interval. At present the only sample submitted for PAH analysis was collected at a depth of 18 feet bgs.

5. **Request for Work Plan and Updated Site Conceptual Model (SCM) –** While not a consideration under the LTCP, ACDEH has compared the soil vapor concentrations to Environmental Screening Levels (ESLs) as promulgated by the San Francisco Bay Regional Water Quality Control Board (RWQCB) in order to provide an alternative understanding of potential risks to workers and the public at the site. Due to highly elevated concentrations of TPHg vapor (up to 25,000,000 µg/m^3), substantially above commercial soil vapor ESLs, the detection limits for benzene and naphthalene were not sufficient to detect contaminant concentrations below appropriate commercial soil vapor ESLs. The notable vapor concentrations, collected at approximately six to eight feet bgs, suggest that either significant shallow hydrocarbon contamination is present and has not been defined (as suggested by combined TPH concentrations in shallow soil at SV-6), or that hydrocarbon contamination at depth remains a significant source of contamination for both groundwater and soil vapor throughout the soil column. The presence of substantial carbon dioxide and methane, and very low concentrations of oxygen at six to eight feet bgs indicate that oxygen limited biodegradation is active beneath the site, and suggest that soil vapor extraction (SVE) or Dual Phased Extraction (DPE) is a viable remedial alternative for the potential shallow soil contamination.

   ACDEH is concerned that the proposed in-situ oxidation of contaminants, in a generally high temperature and high pressure series of reactions, will substantially reduce or effectively kill-off the existing microbial population that appears to be active beneath the site, and which the LTCP assumes will be present to handle remaining residual contamination after implementation of remedial actions.

   ACDEH is also concerned that sufficient infrastructure requirements of the proposed in-situ oxidation have not been factored into the proposal. This includes the potential for vapor pressure cut-off trenches to protect the existing subsurface fueling system infrastructure from increased vapor pressures and elevated temperatures due to the generation of degradation products from the hydrocarbon contamination reactions, and similarly to manage the increased risk of vapor intrusion to the building from increased vapor pressures, and potentially may not be an appropriate remedial technology.

   Finally, ACDEH is concerned that, based on recently collected data around the former UST complex, the proposed treatment area is not sufficiently large to address residual contamination at locations closer to the building (B-2 [2,400 mg/kg TPHg], B-3, B-15, and potentially B-22, or others), and the area around soil bore B-21 (11,000 mg/kg TPHg) which would contain sufficient residual mass that are above concentrations the LTCP technical justification papers indicate are indicative of free phase in soil, and are capable of continuing to leach to groundwater from the vadose zone.

   Therefore, ACDEH requests a work plan to laterally define hydrocarbon contamination in shallow and deep soil in all appropriate directions as discussed previously above in order to appropriately size a remedial system, the collection of PAH analytical data within the 0 to 5 foot depth interval, collection of additional soil vapor samples to determine temporal variation in soil vapor at the site, define the lateral extent of soil vapor concentrations of concern in order to appropriately size and select an

appropriate remedial system, collect multiple sub-slab vapor samples from beneath the building in order to determine the current and future risk of vapor intrusion to the building, generate a sensitive receptor survey as previously proposed, update the SCM, and to potentially propose additional pilot tests that include SVE or DPE technologies prior to implementation of pilot testing at the site.

Please note that prior to implementation of corrective actions, ACDEH will additionally request the generation of a Corrective Action Implementation Plan (CAIP) that provides further specific details on the implementation of the selected corrective actions.

6. **Meeting or Conference Call –** At this juncture it appears that a meeting or conference call would be useful to move the site forward and to effectively communicate between stakeholders. ACDEH requests the identification of the preferred method for communicating, and of several potential dates, by the date identified below.

TECHNICAL REPORT REQUEST

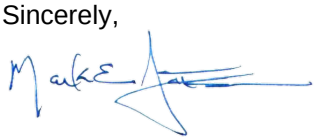
Please submit the following technical reports and deliverables to the State Water Board's Geotracker website and notify your case worker by electronic mail (mark.detterman@acgov.org), in accordance with the following specified file naming convention and schedule, as provided below, and in the Responsible Party(ies) Legal Requirements/Obligations which is included as Attachment 1. Please note ACDEH no longer accepts reports on the ftp site.

- **September 14, 2018 –** Potential Meeting or Conference Call Dates
  File to be named: RO74_WP_R_yyyy-mm-dd
- **November 2, 2018 –** Work Plan and Updated Focused SCM
  File to be named: RO74_WP_R_yyyy-mm-dd
- **November 2, 2018 –** Second 2018 Semi-Annual Groundwater Monitoring
  File to be named: RO74_GWM_R_yyyy-mm-dd
- **May 3, 2019 –** First 2019 Semi-Annual Groundwater Monitoring
  File to be named: RO74_GWM_R_yyyy-mm-dd

Online case files are available for review at the following website: http://www.acgov.org/aceh/index.htm.

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,



Mark E. Detterman, PG 4799, CEG 1788
Senior Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions

cc: Leonard Albright, Green Star Environmental, 354 McDonnell Street, Suite 9, Lewisville, TX 75057 (Sent via electronic mail to: LCAlbright@greenstarenvironmental.com)

Terrance Harriman, Green Star Environmental, 354 McDonnell Street, Suite 9, Lewisville, TX 75057 (Sent via electronic mail to: TAHarriman@greenstarenvironmental.com)

William Little, Advanced GeoEnvironmental, Inc, 837 Shaw Road, Stockton, CA 95215
(Sent via electronic mail to: WLittle@advgeoenv.com)

Dilan Roe, ACDEH, (Sent via electronic mail to: dilan.roe@acgov.org)
Paresh Khatri, ACDEH; (Sent via electronic mail to: paresh.khatri@acgov.org)
Mark Detterman, ACDEH, (Sent via electronic mail to: mark.detterman@acgov.org)
Electronic File; GeoTracker

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** December 14, 2017
	ISSUE DATE: July 25, 2012
	PREVIOUS REVISIONS: September 17, 2013, May 15, 2014, December 12, 2016
SECTION: ACDEH Procedures	**SUBJECT:** Responsible Party(ies) Legal Requirements / Obligations

REPORT & DELIVERABLE REQUESTS

Alameda County Department of Environmental Health (ACDEH) Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) require submission of all reports in electronic form to the State Water Board's (SWB) GeoTracker website in accordance with California Code of Regulations, Chapter 30, Division3, Title 23 and Division 3, Title 27.

Leaking Underground Fuel Tank (LUFT) Cases

Reports and deliverable requests are pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party (RP) in conjunction with an unauthorized release from a petroleum underground storage tank (UST) system.

Site Cleanup Program (SCP) Cases

For non-petroleum UST cases, reports and deliverables requests are pursuant to California Health and Safety Code Section 101480.

ELECTRONIC SUBMITTAL OF REPORTS

A complete report submittal includes the PDF report and all associated electronic data files, including but not limited to GEO_MAP, GEO_XY, GEO_Z, GEO_BORE, GEO_WELL, and laboratory analytical data in Electronic Deliverable Format™ (EDF). Additional information on these requirements is available on the State Water Board's website (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

- Do not upload draft reports to GeoTracker
- Rotate each page in the PDF document in the direction that will make it easiest to read on a computer monitor.

GEOTRACKER UPLOAD CERTIFICATION

Each report submittal is to include a GeoTracker Upload Summary Table with GeoTracker valid values[1] as illustrated in the example below to facilitate ACDEH review and verify compliance with GeoTracker requirements.

GeoTracker Upload Table Example

Report Title	Sample Period	PDF Report	GEO_MAPS	Sample ID	Matrix	GEO_Z	GEO_XY	GEO_BORE	GEO_WELL	EDF
2016 Subsurface Investigation Report	2016 S1	✓	✓	Effluent	SO	☐	☐	☐	☐	✓
2012 Site Assessment Work Plan	2012	✓	✓			☐	☐	☐	☐	☐
2010 GW Investigation Report	2008 Q4	✓	✓	SB-10	W	✓	☐	☐	☐	✓
				SB-10-6	SO	☐	☐	☐	☐	✓
				MW-1	WG	✓	✓	✓	✓	✓
				SW-1	W	✓	✓	✓	✓	✓

[1] GeoTracker Survey XYZ, Well Data, and Site Map Guidelines & Restrictions, CA State Water Resources Control Board, April 2005

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** NA
	ISSUE DATE: December 14, 2017
	PREVIOUS REVISIONS: September 17, 2013, May 15, 2014, December 12, 2016
SECTION: ACDEH Procedures	**SUBJECT:** Responsible Party(ies) Legal Requirements / Obligations

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Board's GeoTracker website." This letter must be signed by the Responsible Party, or legally authorized representative of the Responsible Party.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6731, 6735, and 7835) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional and include the professional registration stamp, signature, and statement of professional certification. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: http://www.bpelsg.ca.gov/laws/index.shtml.

UNDERGROUND STORAGE TANK CLEANUP FUND

For LUFT cases, RP's non-compliance with these regulations may result in ineligibility to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse the cost of cleanup. Additional information is available on the internet at: https://www.waterboards.ca.gov/water_issues/programs/ustcf/

AGENCY OVERSIGHT

Significant delays in conducting site assessment/cleanup or report submittals may result in referral of the case to the Regional Water Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.