



ENVIRONMENTAL HEALTH DEPARTMENT
ENVIRONMENTAL PROTECTION
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April 7, 2014

Ms. Alexis Fischer
Chevron Products Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
(sent via electronic mail to
AFischer@chevron.com)

Mr. Amardeep Sidhu
Malwa Petroleum Sales, LLC
32875 Bluebird Loop
Fremont, CA 94555

Mike and Dean Najdawi
1001 Shoreway Road
Belmont, CA 94002

7225 Bancroft St LP
c/o Najdawi Investments, Inc.
5 Kingswood Circle
Hillsborough, CA 94010

Subject: Request for Focused Site Conceptual Model Addendum and Data Gap Work Plan; Fuel Leak Case No. RO0000274 and Geotracker Global ID T0600102079, Chevron #9-3322; 7225 Bancroft Avenue, Oakland, CA 94605

Dear Responsible Parties:

Alameda County Environmental Health (ACEH) staff has reviewed the case file including the *Second Quarter 2013 Groundwater Monitoring and Sampling Report*, dated August 16, 2013, submitted on your behalf by Conestoga-Rovers & Associates (CRA). Thank you for the submittal of the report.

ACEH 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 ACEH staff review, we have determined that the site fails to meet the LTCP General Criteria d (free product removed to extent practicable), e (Site Conceptual Model), f (secondary source removed to the extent practicable), the Media-Specific Criteria for Groundwater, and the Media-Specific Criteria for Vapor Intrusion to Indoor Air (see Geotracker for a copy of the LTCP checklist).

Therefore, at this juncture ACEH requests that you prepare a Revised Data Gap Investigation Work Plan that is supported by a focused Site Conceptual Model (SCM) to address the Technical Comments provided below.

TECHNICAL COMMENTS

- 1. LTCP General Criteria d (Free Product)** – The LTCP requires free product to be removed to the extent practicable at release sites where investigations indicate the presence of free product by removing in a manner that minimizes the spread of the unauthorized release into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges, or disposes of recovery byproducts in compliance with applicable laws. Additionally, the LTCP requires that abatement of free product migration be used as a minimum objective for the design of any free product removal system.

ACEH's review of the case files indicates that insufficient data and analysis has been presented to assess free product at the site. Specifically, total petroleum hydrocarbons as gasoline (TPHg) and benzene were detected at concentrations technical support documents for the LTCP consider to be

indirect evidence of Light Non-Aqueous Phase Liquid (LNAPL). Prior to the introduction of surfactant in 2007 LNAPL was consistently observed in wells MW-1; however, subsequently LNAPL has not been observed but concentrations indicative of LNAPL remain. Concentrations from the most recently available groundwater monitoring event (September 2013) ranged up to 130,000 micrograms per liter ($\mu\text{g/l}$) TPHg, and 19,000 $\mu\text{g/l}$ benzene. During the August 1998 groundwater sampling event, well MW-1 contained nearly identical concentrations (130,000 $\mu\text{g/l}$ and 19,000 $\mu\text{g/l}$, respectively). In the intervening years, contaminant concentrations have ranged up to 340,000 TPHg and 28,000 $\mu\text{g/l}$ benzene. Contaminant concentrations in the well have not decreased or degraded in over 15 years. Wells MW-1 and MW-7 also contain consistent elevated ethanol detection limits that suggest that the lack of degradation of benzene in the wells may be related to the presence of ethanol in the wells. The introduction of surfactant in 2007 to these wells may also be limiting biodegradation beneath the site.

Please evaluate the adequacy of LNAPL removal in the focused SCM and if applicable present a strategy in the Data Gap Work Plan (described in Item 6 below) to address the items discussed above. Alternatively, please provide justification of why the site satisfies this general criterion in the focused SCM described in Item 6 below.

- 2. LTCP General Criteria e (Site Conceptual Model)** – According to the LTCP, the SCM is a fundamental element of a comprehensive site investigation. The SCM establishes the source and attributes of the unauthorized release, describes all affected media (including soil, groundwater, and soil vapor as appropriate), describes local geology, hydrogeology and other physical site characteristics that affect contaminant environmental transport and fate, and identifies all confirmed and potential contaminant receptors (including water supply wells, surface water bodies, structures and their inhabitants). The SCM is relied upon by practitioners as a guide for investigative design and data collection. All relevant site characteristics identified by the SCM shall be assessed and supported by data so that the nature, extent and mobility of the release have been established to determine conformance with applicable criteria in this policy.

Our review of the case files indicates that insufficient data collection and analysis has not been presented to assess the nature, extent, and mobility of the release and to support compliance with General Criteria d as discussed in Item 1 above, General Criteria f, Media Specific Criteria for Groundwater, and Vapor Intrusion to Indoor Air, as described in Items 3, 4 and 5 below, respectively.

- 3. 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.

The removal of product piping in August 1996 is the only documented removal of existing underground dispensing infrastructure at the site. Confirmation soil samples detected soil concentrations up to 500 milligrams per kilogram (mg/kg) TPHg at 4 feet below grade surface (bgs), 4.2 mg/kg benzene at 3 feet bgs, and 1.1 mg/kg MTBE at 4 feet bgs (confirmation soil samples P-6, P7, P8, and P10). Technical support documents for the LTCP consider concentrations in soil greater than 100 – 200 mg/kg TPHg to be indirect evidence of LNAPL in soil at a site.

Additionally, ACEH’s files contain a facsimile copy (dated August 14, 1996) of a former site schematic that indicates that a piping “elbow sloughed off” near the southern dispensers associated with an earlier tank configuration, and that no soil sample had been collected. Two fuel releases have been

reported to be associated with the site, an earlier leaded gasoline and a reformulated gasoline containing MTBE. ACEH assumes the earlier release may be associated with this release location. This release vicinity has not been further characterized at depth. ACEH has attached a copy of the facsimile. Finally, the presence of elevated ethanol limits of detection in wells MW-1 and MW-7 indicates that a third release has occurred at the site.

Please present a strategy in the Data Gap Work Plan (described in Item 6 below) to address the items discussed above. Alternatively, please provide justification of why the site satisfies this general criterion in the focused SCM described in Item 6 below.

4. **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. **Insufficient Characterization of Hydrogeology** – The hydrogeology of the site appears to be fairly complex, and does not appear to be sufficiently characterized. The following elements contribute to this summarization:
 - i. **Length of LNAPL and High Dissolved Phase Plumes** – As noted above, well MW-1 contains groundwater concentrations that technical support documents for the LTCP consider to be indirect evidence of LNAPL. Prior to the introduction of surfactant to wells at the site, including MW-1, LNAPL was consistently observed in the well. At present well MW-4, apparently 50 feet downgradient of well MW-1 contains absolutely no detectable concentration of any hydrocarbon constituent. This is highly unusual in a granular water-bearing zone. The site also has a substantial vertical gradient, with a difference in groundwater levels as much as 6.4 feet across the site (a distance of approximately 100 feet). It appears appropriate to investigate manmade or natural preferential pathways beneath the site verify that well MW-4 is an appropriate downgradient compliance point.
 - ii. **Lateral Extent of LNAPL, Soil, and Groundwater Contamination** – A minimum of two release areas appear to have been present at the site as discussed above. Due to the granular nature of soil at the site, it appears that the older release discharged nearly directly through a granular tank complex to groundwater, as indicated in the soil bore descriptions (see below). As the release appears to involve free-phase liquids released directly to granular tank fill and a granular water-bearing zone, the extent of the LNAPL “pancake” layer, including the upgradient extent, has not been defined offsite to the south, southwest, and southeast of the tank complex(s).
 - iii. **Vertical Extent of Soil and Groundwater Contamination** – The vertical extent of soil and groundwater contamination does not appear to be characterized. This influences the understanding of site hydrogeology, and contaminant pathways and transport. Multiple bore and well logs document that either the highest soil analytical result or the highest PID detection was at or near the bottom of a bore (see for example MW-1, MW-2, MW-3, MW-7, MW-8, B-2, B-5, etc.) A substantial number of high PID detections, at or near the bottom of a bore, were not submitted for laboratory analysis. Additional hydrogeologic pathways may be present beneath the explored depths as the vertical extent of the smear zone is not presently known or understood. As discussed above, the high vertical groundwater gradient further indicates a potential for significant vertical extent and unresolved migration pathways for LNAPL and dissolved-phase hydrocarbons.
 - iv. **Preferential Pathway and Conduit Survey** – The *Creek and Watershed Map of Oakland & Berkeley*, (Oakland Museum of California, 2000; available online at the

ACEH or the Museum's website), indicates the *73rd Avenue Branch Storm Drain*, a major trunk storm drain line, runs toward the bay beneath *73rd Avenue*. Additionally, two large trunk storm drain lines run beneath Bancroft Avenue and beneath the Eastmont Mall parking lot and intersect the *73rd Avenue Branch* storm drain at *73rd Avenue*. The potential to transport substantial volumes of water past the subject site in granular water-bearing zones exists and may influence site groundwater flow. Because the nature of the storm line is undetermined (construction styles, lined or unlined, backfill material surrounding the structures, installation depths, invert depths, etc), and because other utility conduits are likely beneath the adjacent streets, it appears appropriate to conduct a preferential pathway conduit survey.

- v. **Sensitive Receptor Survey** - The subject site is situated on the edge of a residential neighborhood. Because groundwater appears to flow to the north to northwest beneath the residential neighborhood, it appears appropriate to determine if basements or other structures may be present beneath the site vicinity that can eliminate or negate any level of safety through vertical separation built into the LTCP.

It also appears to be appropriate to update the 1998 well survey and incorporate both Department of Water Resources and Alameda County Public Works Agency records for wells that may have been missed or installed in the intervening years.

Please present a strategy in the Data Gap Work Plan (described in Item 6 below) to address the items discussed above. Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Groundwater in the focused SCM described in Item 6 below.

5. **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.

Our review of the case files indicates that the site data collection and analysis fail to support the requisite characteristics of one of the four scenarios. Specifically, while ACEH recognizes this is currently an active service station that is exempt from meeting the criteria onsite, the assumed groundwater flow direction appears to immediately underflow a residential neighborhood, with unknown construction styles (depth of foundation, slab on grade vs. crawl space, presence of any basements, etc.). The onsite groundwater concentration of benzene was recently 19,000 µg/l. Groundwater concentrations at the assumed downgradient property line were recently as high as 680 µg/l benzene (MW-6, and were on a notable increasing concentration trend), and oxygen concentrations were as low as 1.4% (VP-1) at a depth of five feet. Soil analytical data collected at 5 and 10 feet bgs in vapor probes VP-1 to VP-3 indicate that TPH is less than 100 mg/kg. The lack of knowledge of home construction, and the increasing benzene concentration trend does not allow use of scenarios 1 to 3, and the lack of recent vapor samples collected within the increasing benzene trend period does not appear to allow use of scenario 4. The collection of additional vapor samples at locations adjacent to the residents appears appropriate, and should be done in conjunction additional site investigations, as discussed above.

Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Vapor Intrusion to Indoor Air in a SCM that assures that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to occupants of adjacent buildings.

Please note, that if direct measurement of soil gas is proposed, ensure that your strategy is consistent with the field sampling protocols described in the Department of Toxic Substances Control's Final Vapor Intrusion Guidance (October 2011). Consistent with the guidance, ACEH requires installation of permanent vapor wells to assess temporal and seasonal variations in soil gas concentrations.

- 6. Revised Data Gap Investigation Work Plan and Focused Site Conceptual Model** – Please prepare Revised Data Gap Investigation Work Plan to address the technical comments listed above. Please support the scope of work in the Revised Data Gap Investigation Work Plan with a focused SCM and Data Quality Objectives (DQOs) that relate the data collection to each LTCP criteria. For example please clarify which scenario within each Media-Specific Criteria a sampling strategy is intended to apply to.

In order to expedite review, ACEH requests the focused SCM be presented in a tabular format that highlights the major SCM elements and associated data gaps, which need to be addressed to progress the site to case closure under the LTCP. Please see Attachment A “Site Conceptual Model Requisite Elements”. Please sequence activities in the proposed revised data gap investigation scope of work to enable efficient data collection in the fewest mobilizations possible.

- 7. Groundwater Monitoring** – The subject site is required to be sampled on a quarterly basis; however, three quarterly groundwater monitoring events have not been submitted to ACEH since the last submitted report dated August 16, 2013 (however, one has been submitted to Geotracker). Groundwater monitoring data for the third and fourth quarter 2013, and first quarter 2014 are now overdue. Therefore ACEH requests that groundwater monitoring reports be submitted in accordance with the following schedule.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Mark Detterman), and to the State Water Resources Control Board’s Geotracker website, in accordance with the specified file naming convention below, according to the following schedule:

- **April 28, 2014** – Third and Fourth Quarter 2013 Groundwater Monitoring Reports
Files to be named: RO274_GWM_R_YYYY-MM-DD
- **April 28, 2014** – First Quarter 2014 Groundwater Monitoring Report
File to be named: RO274_GWM_R_YYYY-MM-DD
- **May 16, 2014** – Second Quarter 2014 Groundwater Monitoring Report
File to be named: RO274_GWM_R_YYYY-MM-DD
- **July 13, 2014** – Data Gap Investigation Plan and Focused Site Conceptual Model
File to be named: RO274_WP_SCM_R_YYYY-MM-DD
- **August 15, 2014** – Third Quarter 2014 Groundwater Monitoring Report
File to be named: RO274_GWM_R_YYYY-MM-DD
- **60 Days After Work Plan Approval** – Site Investigation Report and Updated SCM
File to be named: RO274_SWI_R_YYYY-MM-DD

These reports are being requested 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 in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

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

Responsible Parties
RO0000274
April 7, 2014, Page 6

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

Sincerely,

Mark E. Detterman, P.G., C.E.G.
Senior Hazardous Materials Specialist

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

Attachment A - Site Conceptual Model Requisite Elements

August 14, 1996 facsimile of old site plan and notes

cc: Nathan Lee, Connestoga-Rovers & Associates, Inc., 5900 Hollis Street, Suite A, Emeryville, CA 94608; (sent via electronic mail to nlee@craworld.com)

Leroy Griffin, Oakland Fire Department 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032 (sent via electronic mail to lgriffin@oaklandnet.com)

Dilan Roe, ACEH (sent via electronic mail to dilan.roe@acgov.org)
Mark Detterman (sent via electronic mail to mark.detterman@acgov.org)
Electronic file, GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements: (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "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." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 7835, and 7835.1) 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 registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional 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.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	REVISION DATE: July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	SUBJECT: Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as a **single Portable Document Format (PDF) with no password protection.**
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document.** Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted.**
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

- 1) Obtain User Name and Password
 - a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
 - i) Send an e-mail to deh.loptoxic@acgov.org
 - b) In the subject line of your request, be sure to include "**ftp PASSWORD REQUEST**" and in the body of your request, include the **Contact Information, Site Addresses, and the Case Numbers (RO# available in Geotracker) you will be posting for.**
- 2) Upload Files to the ftp Site
 - a) Using Internet Explorer (IE4+), go to <ftp://alcoftp1.acgov.org>
 - (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
 - b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
 - c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
 - d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
 - e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.
- 3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
 - a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
 - b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
 - c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
 - d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

ATTACHMENT A

Site Conceptual Model Requisite Elements

ATTACHMENT A

Site Conceptual Model

The site conceptual model (SCM) is an essential decision-making and communication tool for all interested parties during the site characterization, remediation planning and implementation, and closure process. A SCM is a set of working hypotheses pertaining to all aspects of the contaminant release, including site geology, hydrogeology, release history, residual and dissolved contamination, attenuation mechanisms, pathways to nearby receptors, and likely magnitude of potential impacts to receptors.

The SCM is initially used to characterize the site and identify data gaps. As the investigation proceeds and the data gaps are filled, the working hypotheses are modified, and the overall SCM is refined and strengthened until it is said to be “validated”. At this point, the focus of the SCM shifts from site characterization towards remedial technology evaluation and selection, and later remedy optimization, and forms the foundation for developing the most cost-effective corrective action plan to protect existing and potential receptors.

For ease of review, Alameda County Environmental Health (ACEH) requests utilization of tabular formats to (1) highlight the major SCM elements and their associated data gaps which need to be addressed to progress the site to case closure (see Table 1 of attached example), and (2) highlight the identified data gaps and proposed investigation activities (see Table 2 of the attached example). ACEH requests that the tables presenting the SCM elements, data gaps, and proposed investigation activities be updated as appropriate at each stage of the project and submitted with work plans, feasibility studies, corrective action plans, and requests for closures to support proposed work, conclusions, and/or recommendations.

The SCM should incorporate, but is not limited to, the topics listed below. Please support the SCM with the use of large-scaled maps and graphics, tables, and conceptual diagrams to illustrate key points. Please include an extended site map(s) utilizing an aerial photographic base map with sufficient resolution to show the facility, delineation of streets and property boundaries within the adjacent neighborhood, downgradient irrigation wells, and proposed locations of transects, monitoring wells, and soil vapor probes.

- a. Regional and local (on-site and off-site) geology and hydrogeology. Include a discussion of the surface geology (e.g., soil types, soil parameters, outcrops, faulting), subsurface geology (e.g., stratigraphy, continuity, and connectivity), and hydrogeology (e.g., water-bearing zones, hydrologic parameters, impermeable strata). Please include a structural contour map (top of unit) and isopach map for the aquitard that is presumed to separate your release from the deeper aquifer(s), cross sections, soil boring and monitoring well logs and locations, and copies of regional geologic maps.
- b. Analysis of the hydraulic flow system in the vicinity of the site. Include rose diagrams for depicting groundwater gradients. The rose diagram shall be plotted on groundwater elevation contour maps and updated in all future reports submitted for your site. Please address changes due to seasonal precipitation and groundwater pumping, and evaluate the potential interconnection between shallow and deep aquifers. Please include an analysis of vertical hydraulic gradients, and effects of pumping rates on hydraulic head from nearby water supply wells, if appropriate. Include hydraulic head in the different water bearing zones and hydrographs of all monitoring wells.
- c. Release history, including potential source(s) of releases, potential contaminants of concern (COC) associated with each potential release, confirmed source locations, confirmed release locations, and existing delineation of release areas. Address primary leak source(s) (e.g., a tank, sump, pipeline, etc.) and secondary sources (e.g., high-

ATTACHMENT A

Site Conceptual Model (continued)

concentration contaminants in low-permeability lithologic soil units that sustain groundwater or vapor plumes). Include local and regional plan view maps that illustrate the location of sources (former facilities, piping, tanks, etc.).

- d. Plume (soil gas and groundwater) development and dynamics including aging of source(s), phase distribution (NAPL, dissolved, vapor, residual), diving plumes, attenuation mechanisms, migration routes, preferential pathways (geologic and anthropogenic), magnitude of chemicals of concern and spatial and temporal changes in concentrations, and contaminant fate and transport. Please include three-dimensional plume maps for groundwater and two-dimensional soil vapor plume plan view maps to provide an accurate depiction of the contaminant distribution of each COC.
- e. Summary tables of chemical concentrations in different media (i.e., soil, groundwater, and soil vapor). Please include applicable environmental screening levels on all tables. Include graphs of contaminant concentrations versus time.
- f. Current and historic facility structures (e.g., buildings, drain systems, sewer systems, underground utilities, etc.) and physical features including topographical features (e.g., hills, gradients, surface vegetation, or pavement) and surface water features (e.g. routes of drainage ditches, links to water bodies). Please include current and historic site maps.
- g. Current and historic site operations/processes (e.g., parts cleaning, chemical storage areas, manufacturing, etc.).
- h. Other contaminant release sites in the vicinity of the site. Hydrogeologic and contaminant data from those sites may prove helpful in testing certain hypotheses for the SCM. Include a summary of work and technical findings from nearby release sites, including the two adjacent closed LUFT sites, (i.e., Montgomery Ward site and the Quest Laboratory site).
- i. Land uses and exposure scenarios on the facility and adjacent properties. Include beneficial resources (e.g., groundwater classification, wetlands, natural resources, etc.), resource use locations (e.g., water supply wells, surface water intakes), subpopulation types and locations (e.g., schools, hospitals, day care centers, etc.), exposure scenarios (e.g. residential, industrial, recreational, farming), and exposure pathways, and potential threat to sensitive receptors. Include an analysis of the contaminant volatilization from the subsurface to indoor/outdoor air exposure route (i.e., vapor pathway). Please include copies of Sanborn maps and aerial photographs, as appropriate.
- j. Identification and listing of specific data gaps that require further investigation during subsequent phases of work. Proposed activities to investigate and fill data gaps identified.

**TABLE 1
INITIAL SITE CONCEPTUAL MODEL**

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Geology and Hydrogeology	Regional	<p>The site is in the northwest portion of the Livermore Valley, which consists of a structural trough within the Diablo Range and contains the Livermore Valley Groundwater Basin (referred to as "the Basin") (DWR, 2006). Several faults traverse the Basin, which act as barriers to groundwater flow, as evidenced by large differences in water levels between the upgradient and downgradient sides of these faults (DWR, 2006). The Basin is divided into 12 groundwater basins, which are defined by faults and non-water-bearing geologic units (DWR, 1974).</p> <p>The hydrogeology of the Basin consists of a thick sequence of fresh-water-bearing continental deposits from alluvial fans, outwash plains, and lacustrine environments to up to approximately 5,000 feet bgs (DWR, 2006). Three defined fresh-water bearing geologic units exist within the Basin: Holocene Valley Fill (up to approximately 400 feet bgs in the central portion of the Basin), the Plio-Pleistocene Livermore Formation (generally between approximately 400 and 4,000 feet bgs in the central portion of the Basin), and the Pliocene Tassajara Formation (generally between approximately 250 and 5,000 or more feet bgs) (DWR, 1974). The Valley Fill units in the western portion of the Basin are capped by up to 40 feet of clay (DWR, 2006).</p>	None	NA
	Site	<p>Geology: Borings advanced at the site indicate that subsurface materials consist primarily of finer-grained deposits (clay, sandy clay, silt and sandy silt) with interbedded sand lenses to 20 feet below ground surface (bgs), the approximate depth to which these borings were advanced. The documented lithology for one on-site boring that was logged to approximately 45 feet bgs indicates that beyond approximately 20 feet bgs, fine-grained soils are present to approximately 45 feet bgs. A cone penetrometer technology test indicated the presence of sandier lenses from approximately 45 to 58 feet bgs and even coarser materials (interbedded with finer-grained materials) from approximately 58 feet to 75 feet bgs, the total depth drilled. The lithology documented at the site is similar to that reported at other nearby sites, specifically the Montgomery Ward site (7575 Dublin Boulevard), the Quest laboratory site (6511 Golden Gate Drive), the Shell-branded Service Station site (11989 Dublin Boulevard), and the Chevron site (7007 San Ramon Road).</p> <p>Hydrogeology: Shallow groundwater has been encountered at depths of approximately 9 to 15 feet bgs. The hydraulic gradient and groundwater flow direction have not been specifically evaluated at the site.</p>	<p>As noted, most borings at the site have been advanced to approximately 20 feet bgs, and one boring has been advanced and logged to 45 feet bgs; CPT data was collected to 75 feet bgs at one location. Lithologic data will be obtained from additional borings that will be advanced on site to further the understanding of the subsurface, especially with respect to deeper lithology.</p> <p>The on-site shallow groundwater horizontal gradient has not been confirmed. Additionally, it is not known if there may be a vertical component to the hydraulic gradient.</p>	<p>Two direct push borings and four multi-port wells will be advanced to depth (up to approximately 75 feet bgs) and soil lithology will be logged. See items 4 and 5 on Table 2.</p> <p>Shallow and deeper groundwater monitoring wells will be installed to provide information on lateral and vertical gradients. See Items 2 and 5 on Table 2.</p>
Surface Water Bodies		The closest surface water bodies are culverted creeks. Martin Canyon Creek flows from a gully west of the site, enters a culvert north of the site, and then bends to the south, passing approximately 1,000 feet east of the site before flowing into the Alamo Canal. Dublin Creek flows from a gully west of the site, enters a culvert approximately 750 feet south of the site, and then joins Martin Canyon Creek approximately 750 feet southeast of the site.	None	NA
Nearby Wells		The State Water Resources Control Board's GeoTracker GAMA website includes information regarding the approximate locations of water supply wells in California. In the vicinity of the site, the closest water supply wells presented on this website are depicted approximately 2 miles southeast of the site; the locations shown are approximate (within 1 mile of actual location for California Department of Public Health supply wells and 0.5 mile for other supply wells). No water-producing wells were identified within 1/4 mile of the site in the well survey conducted for the Quest Laboratory site (6511 Golden Gate Drive; documented in 2009); information documented in a 2005 report for the Chevron site at 7007 San Ramon Road indicates that a water-producing well may exist within 1/2 mile of the site.	A formal well survey is needed to identify water-producing, monitoring, cathodic protection, and dewatering wells.	Obtain data regarding nearby, permitted wells from the California Department of Water Resources and Zone 7 Water Agency (Item 11 on Table 2).

TABLE 2
DATA GAPS AND PROPOSED INVESTIGATION

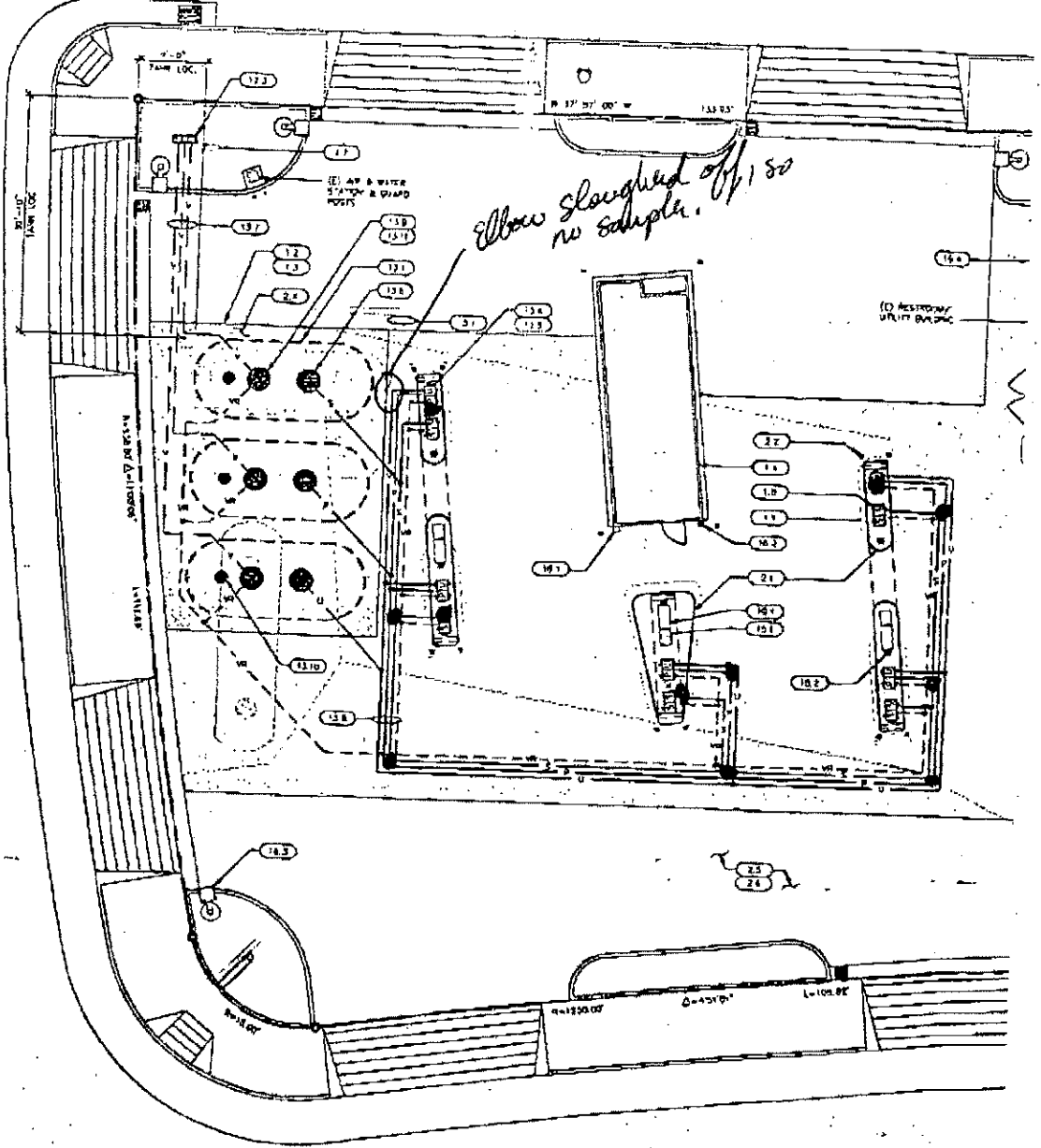
Item	Data Gap	Proposed Investigation	Rationale	Analysis
5	Evaluate the possible presence of impacts to deeper groundwater. Evaluate deeper groundwater concentration trends over time. Obtain data regarding the vertical groundwater gradient. Obtain more lithological data below 20 feet bgs.	Install four continuous multichannel tubing (CMT) groundwater monitoring wells (aka multi-port wells) to approximately 65 feet bgs in the northern parking lot with ports at three depths (monitoring well locations may be adjusted pending results of shallow grab groundwater samples; we will discuss any potential changes with ACEH before proceeding). Groundwater monitoring frequency to be determined. Soil samples will be collected only if there are field indications of impacts. Soil lithology will be logged. However, information regarding the moisture content of soil may not be reliable using sonic drilling technology (two borings will be logged using direct push technology; see Item 4, above).	One well is proposed at the western (upgradient) property boundary to confirm that there are no deeper groundwater impacts from upgradient. Two wells are proposed near the center of the northern parking lot to evaluate potential impacts in an area where deeper impacts, if any, would most likely to be found. One well is proposed at the eastern (downgradient) property boundary to confirm that there are no impacts extending off-site. Port depths will be chosen based on the locations of saturated soils (as logged in direct push borings; see Item 4, above), but are expected at approximately 15, 45, and 60 feet bgs.	<i>Groundwater:</i> VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance.
6	Evaluate possible off-site migration of impacted soil vapor in the downgradient direction (east). Evaluate concentration trends over time.	Install 4 temporary nested soil vapor probes at approximately 4 and 8 feet bgs along the eastern property boundary. Based on the results of the sampling, two sets of nested probes will be converted to vapor monitoring wells to allow for evaluation of VOC concentration trends over time.	Available data indicate that PCE and TCE are present in soil vapor in the eastern portion of the northern parking lot. Samples are proposed on approximately 50-foot intervals along the eastern property boundary to provide a transect of concentrations through the vapor plume. The depths of 4 and 8 feet bgs are chosen to provide data closest to the source (i.e., groundwater) while avoiding saturated soil, and also provide shallower data to help evaluate potential attenuation within the soil column. Two sets of nested vapor probes will be converted into vapor monitoring wells (by installing well boxes at ground surface); the locations of the permanent wells will be chosen based on the results of samples from the temporary probes.	<i>Soil vapor:</i> VOCs by EPA Method TO-15.
7	Evaluate potential for off-site migration of impacted groundwater in the downgradient direction (east).	Advance two borings to approximately 20 feet bgs in the parking lot of the property east of the Crown site for collection of grab groundwater samples.	Two borings are proposed off-site, on the property east of the Crown site, just east of the building in the expected area of highest potential VOC concentrations.	<i>Groundwater:</i> VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance.
8	Evaluate VOC concentrations just north of the highest concentration area.	Advance two borings to approximately 20 feet bgs north of Building A for collection of soil and grab groundwater samples. Soil samples will be collected at two depths in the vadose zone. Soil samples will be collected based on field indications of impacts (PID readings, odor, staining) or, in the absence of field indications of impacts, at 5 and 10 feet bgs.	The highest concentrations of PCE in groundwater were detected at boring NM-B-32, just north of Building A. The nearest available data to the north are approximately 75 feet away. One of the borings will be advanced approximately 20 feet north of NM-B-32 to provide data close to the highest concentration area. A second boring will be advanced approximately halfway between the first boring and former boring NM-B-33 to provide additional spatial data for contouring purposes. These borings will be part of a transect in the highest concentration area.	<i>Groundwater:</i> VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance. <i>Soil:</i> VOCs by EPA Method 8260 (soil samples to be collected using field preservation in accordance with EPA Method 5035).
9	Evaluate VOC concentrations in soil vapor in the south parcel of the site.	Install four temporary soil vapor probes at approximately 5 feet bgs around boring SV-25, where PCE was detected in soil vapor at a low concentration.	PCE was detected in soil vapor sample SV-25 in the southern parcel, although was not detected in groundwater in that area. Three probes will be installed approximately 30 feet from of boring SV-25 to attempt to delineate the extent of impacts. A fourth probe is proposed west of the original sample, close to the property boundary and the location of mapped utility lines, which may be a potential conduit, to evaluate potential impacts from the west.	<i>Soil vapor:</i> VOCs by EPA Method TO-15.
10	Obtain additional information regarding subsurface structures and utilities to further evaluate migration pathways and sources.	Ground penetrating radar (GPR) and other utility locating methodologies will be used, as appropriate, to further evaluate the presence of unknown utilities and structures at the site.	Utilities have been identified at the site that include an on-site sewer lateral and drain line, and shallow water, electric, and gas lines. Given the current understanding of the distribution of PCE in groundwater at the site, it is possible that other subsurface utilities, and specifically sewer laterals, exist that may act as a source or migration pathway for distribution of VOCs in the subsurface.	NA

Sample locations (~ 2' bgs)

HALLIDAY AVENUE

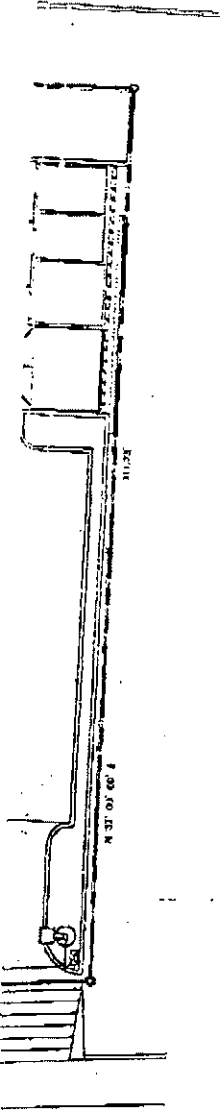
73RD AVENUE

BANCROFT AVENUE



MAY 10, 1988 12:16 Scale 1/20 VISUMON-CRIB

DRAWING NO. B3332A1



KEY NOTES

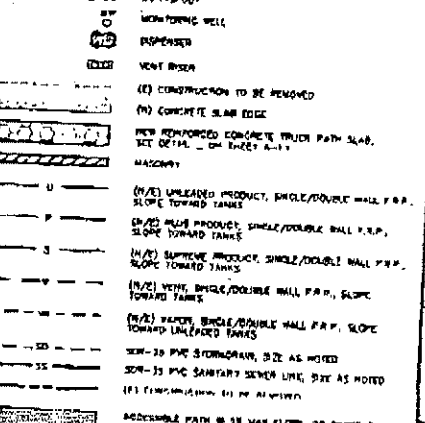
1. THE INFORMATION REGARDING THIS SITE WAS OBTAINED FROM AN EXISTING CONSTRUCTION / S.A. PROJECTS COMPANY RECORD AND COOPERATION FROM THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL SITE CONDITIONS PRIOR TO CONSTRUCTION. ANY CHANGES TO THE PROJECT SHALL BE MADE TO THE DRAWINGS BY THE CONTRACTOR'S REPRESENTATIVE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE COMPANY REPRESENTATIVE BEFORE PROCEEDING WITH ANY WORK.
 2. CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS AND BUILDING DEPARTMENT APPROVALS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS OR MARKERS THROUGH CONSTRUCTION.
 3. THE CONTRACTOR SHALL MAKE PROVISIONS TO HAVE ALL EXISTING ON-SITE UTILITIES AND UTILITY LINES IDENTIFIED AND RELOCATED IF THEY ARE FOUND TO BE IN CONFLICT WITH NEW CONSTRUCTION. ALL EXISTING UTILITY LINES SHALL BE PROTECTED AND MAINTAINED THROUGHOUT CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITY LINES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 4. CONDUIT CUTTERS AND CHAIN LINES SHALL BE CLEANED AND WATER TESTED TO INSURE PROPER DRAINAGE.
 5. THE CONTRACTOR SHALL MAINTAIN A MINIMUM RAINFALL OF 1/2" PER FOOT AT ALL TIMES AND PROVIDE PROVISIONS TO MAINTAIN THIS RAINFALL THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN A MINIMUM RAINFALL OF 1/2" PER FOOT AT ALL TIMES AND PROVIDE PROVISIONS TO MAINTAIN THIS RAINFALL THROUGHOUT CONSTRUCTION.
 6. CONTRACTOR SHALL CLEAN ALL SURFACES OF DIRT AND DEBRIS IF NECESSARY. DO NOT PAINT EXISTING UNPAINTED MASONRY SURFACES.
- CONCRETE**
1. BEFORE THE CONCRETE IS PLACED, THE CONTRACTOR SHALL INSTALL FORMS PER FIELD CONDITIONS WITH CHEVRON REPRESENTATIVE'S APPROVAL.
 2. ALL FORMS SHALL BE OBTAINED FROM THE CONTRACTOR'S REPRESENTATIVE PRIOR TO USE. ALL FORMS SHALL BE OBTAINED FROM THE CONTRACTOR'S REPRESENTATIVE PRIOR TO USE.
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 5. ALL FORMS SHALL BE OBTAINED FROM THE CONTRACTOR'S REPRESENTATIVE PRIOR TO USE.
- PAVING**
1. CONTRACTOR MUST VERIFY THAT THE DRAINAGE IS NOT IMPAIRED BY NEW SITE IMPROVEMENTS. IN THE EVENT THAT A PROBLEM WITH THE DRAINAGE FLOW IS DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE COMPANY REPRESENTATIVE BEFORE PROCEEDING WITH ANY WORK IN THE PROBLEM AREA.
 2. ALL NEW ASPHALT CONCRETE DRIVEWAYS AND CONCRETE WORK SHALL MATCH THE EXISTING GRADES AT THE LIMITS OF WORK. CONCRETE SLABS SHALL BE TYPICAL FROM DRIVEWAYS, PORCHES AND BUILDINGS.
 3. REPAIRS TO EXISTING ASPHALT AND CONCRETE AS NECESSARY DUE TO NEW CONSTRUCTION SHALL BE INSTALLED PER FIELD CONDITIONS.
 4. EXISTING ASPHALT AND/OR CONCRETE SHALL BE CUT TO A NEAT, STRAIGHT LINE (WHEN APPROPRIATE). ASPHALT EXPOSED EDGES SHALL BE TACKED WITH EMULSION PRIOR TO PAVING.
 5. NEW CONCRETE SHALL BE SEaled WITH A CURING COMPASSIBLE SEALER PER CHEVRON REPRESENTATIVE'S DIRECTION.

- GENERAL REQUIREMENTS**
1. UNLESS OTHERWISE NOTED, ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING STANDARDS:
 - (A) CONSTRUCTION OF BUILDINGS (CBC)
 - (B) CALIFORNIA BUILDING CODE (CBC)
 - (C) INTERNATIONAL BUILDING CODE (IBC)
 - (D) CALIFORNIA ELECTRICAL CODE (CEC)
 - (E) CALIFORNIA MECHANICAL CODE (CMC)
 - (F) CALIFORNIA PLUMBING CODE (CPC)
 - (G) CALIFORNIA FIRE CODE (CFC)
 - (H) CALIFORNIA SOILS AND FOUNDATIONS CODE (CSF)
 2. ALL MATERIALS SHALL BE OF THE BEST QUALITY AVAILABLE AND SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE CONTRACTOR'S REPRESENTATIVE.
 3. ALL MATERIALS SHALL BE OF THE BEST QUALITY AVAILABLE AND SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE CONTRACTOR'S REPRESENTATIVE.

- GENERAL NOTES**
1. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES AND CONDUITS THROUGHOUT CONSTRUCTION.
 2. ALL EXISTING UTILITIES AND CONDUITS SHALL BE RELOCATED AND REPAIRED AT THE CONTRACTOR'S EXPENSE.
 3. ALL EXISTING UTILITIES AND CONDUITS SHALL BE RELOCATED AND REPAIRED AT THE CONTRACTOR'S EXPENSE.
 4. ALL EXISTING UTILITIES AND CONDUITS SHALL BE RELOCATED AND REPAIRED AT THE CONTRACTOR'S EXPENSE.
- CONCRETE**
1. CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 2.01.
 2. CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 2.01.
 3. CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 2.01.
- PAVING**
1. ASPHALT SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 3.01.
 2. ASPHALT SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 3.01.
 3. ASPHALT SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE DETAIL ON SHEET 3.01.

SITE PLAN ABBREVIATIONS AND LEGEND

C	= CENTER LINE	P.O.C.	= POINT OF CURVATURE
COL	= COLUMN	R	= RADIUS
CO	= CENTER	R.O.M.	= RIGHT OF WAY
CS	= CURVE	SHY	= SHEET
EQ	= EQUAL	(S.W.)	= SW
F.C.L.	= FACE OF CURVE	(TYP.)	= TYPICAL
F.R.P.	= FIBERGLASS REINFORCED PIPE		
M	= MET		



NO.	DATE	REVISIONS	INITIALS

SITE AND PIPING PLAN

9-3322
7225 BANCROFT AVENUE
OAKLAND, CA



ROBERT H. LEE & ASSOCIATES, INC.

NO.	DATE	DESCRIPTION
1	04 27 92	PRELIMINARY
2	04 27 92	REVISED
3	04 27 92	REVISED
4	04 27 92	REVISED
5	04 27 92	REVISED
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