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By Alameda County Environmental Health at 2:51 pm, Apr 02, 2013

02 April 2013

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

Subject: Lucasey Manufacturing  
2744 East 11<sup>th</sup> Street  
Oakland, CA 94601  
R00002902

Dear Mr. Wickham:

As the legally authorized representative of the above-referenced project location, I have reviewed the Response to Technical Comments (April 2013) prepared by my consultant of record, ERM. I declare, under penalty of perjury, that the information and/or recommendations contained in this report are true and correct to the best of my knowledge.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Lucasey', with a long horizontal flourish extending to the right.

Mr. Charles Lucasey

2 April 2013

Mr. Jerry Wickham  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502



Subject: Response to Technical Comments  
Lucasey Site - 2744 East 11<sup>th</sup> Street, Oakland  
SLIC Case RO0002902

Dear Mr. Wickham:

ERM-West, Inc. (ERM) presents this response to technical comments contained in a 1 November 2013 letter from the Alameda County Environmental Health's (ACEH) regarding the Lucasey site at 2744 East 11<sup>th</sup> Street in Oakland, California, on behalf of Lucasey Manufacturing Corporation. Some comments are addressed by the attached report *Comparison of Site Conditions to Low-Threat Closure Policy Criteria and Recommendation for Site Closure (Zemo & Associates LLC, January 2013)* that is included as Attachment 1.

## **BACKGROUND**

The *Human Health Risk Assessment/Evaluation* (ERM, 2 March 2012) and the *Closure Evaluation* (ERM, 8 October 2012) were submitted to ACEH to supplement information provided in the *Corrective Action Plan* (ERM, 7 April 2011) and to provide justification for closure of the Lucasey site (Site) under the Low-Threat Closure Policy (LTCP) which was adopted by the State Water Resources Control Board on May 1, 2012 and became effective August 17, 2012. A compilation of soil, groundwater and soil vapor sample results for the Site is included in Attachment 2.

## **RESPONSE TO ACEH COMMENTS**

### **1. Risk Evaluation**

ERM conducted a door-to-door survey of the residences downgradient of the Site to determine whether basements or

subgrade spaces existed under the residences. The survey form and list of addresses was approved by ACEH prior to conducting the survey. The completed forms and summary table are included in Attachment 3 and results are summarized below:

- Information was obtained from 18 of the 26 residences in the survey area.
- Attempts were made on three different days to gather information from the eight residences that were not accessible.
- Four of the 18 residences had basements or subgrade spaces ranging from 3 to 5.5 feet below grade.

The information gathered from the survey was incorporated into the Human Health Risk Assessment/Evaluation (HHRAE) previously transmitted. The revised version of this report is included in Attachment 3. The revised HHRAE indicated that using the conservative vapor modeling and hazard/risk assessment screening methods consistent with DTSC, OEHHA and RWQCB guidance, that petroleum related hydrocarbons in the subsurface proximal to off-site residences are unlikely to pose a significant risk to human health.

## **2. Free Product**

Free product monitoring was conducted on 10 January 2013 in previously-installed wells both on- and off-site. The product monitoring field observation sheet and photos of the monitoring are included in Attachment 4. No measurable product was observed in any of the wells.

## **3. Secondary Source Removal**

Refer to Attachment 1.

## **4. Nuisance**

Information was gathered to document the depth of underground utilities within the area of contamination and compare it to the known depth of contamination at the Site. The maps and other documentation of the depth of utilities is included in Attachment 5. The results indicate the following:

- The deepest underground utility is the sewer. The depth of the bottom the sewer pipe is 8 feet bgs;
- The contamination at and downgradient of the Site is at or below 12 feet bgs.

#### **5. Media-Specific Criteria for Groundwater - Plume Size**

Refer to Attachment 1.

#### **6. Media-Specific Criteria for Groundwater- Stable or Decreasing Plume**

Refer to Attachment 1.

#### **7. Media-Specific Criteria for Groundwater - Water Supply Wells**

During the door-to-door survey discussed in Item 1 above, information was gathered regarding the existence of wells, abandoned wells or sumps. The completed forms and summary table are included in Attachment 3 and results are summarized below:

- No residences reported the existence of active or abandoned wells
- No residences reported the existence of sumps.

#### **8. Media-Specific Criteria for Direct Contact and Outdoor Air Exposure**

Refer to Attachment 1.

### ***SUMMARY***

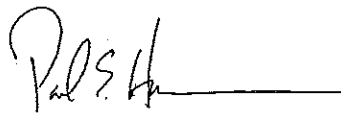
Based on the information presented in this response to comments, the Lucasey site meets all General and Media-Specific criteria in the Low-Threat Closure Policy and therefore qualifies for closure under the policy. Upon review and approval by ACEH, ERM will submit a Draft Notification of Potential Case Closure for distribution to nearby landowners, residents and other interested persons.

Please direct any comments or questions to John Moe at (925) 482-3240.  
Thank you for your consideration.

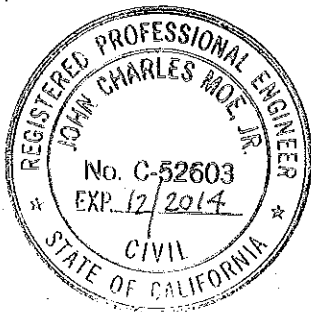
Sincerely,



John Moe  
Project Manager



Paul Hausmann  
Partner-in-Charge



Attachments:

- 1 Comparison of Site Conditions to Low-Threat Closure Policy  
Criteria and Recommendation for Site Closure
- 2 Soil, Groundwater and Soil Vapor Tables
- 3 Door-to-Door Survey and Revised Human Health Risk  
Evaluation/ Assessment
- 4 Free Product Monitoring
- 5 Underground Utilities

cc: Bruce Flushman  
Chuck Lucasey

*Attachment 1*  
*Comparison of Site Conditions to*  
*Low-Threat Closure Policy*  
*Criteria and Recommendation for*  
*Site Closure*

## **Zemo & Associates**

986 Wander Way  
Incline Village, NV 89451  
775-831-6179  
dazemo@zemoassociates.com

February 18, 2013

Mr. John Moe, P.E.  
ERM  
1277 Treat Blvd., Suite 500  
Walnut Creek, CA 94597

Subject: Comparison of Site Conditions to Low-Threat Case Closure Policy Criteria and Recommendation for Site Closure  
Lucasey Manufacturing  
2744 East 11<sup>th</sup> Street, Oakland, California

Dear Mr. Moe:

At your request, I have reviewed technical data for the subject site (ERM April 7, 2011 Corrective Action Plan [CAP]), the Risk Evaluation (ERM March 2, 2012), the "Closure Evaluation" (ERM October 8, 2012), and Alameda County Environmental Health Department's (County) response letter dated November 1, 2012. I have relied on the data as presented in the ERM reports. Based on my expertise with the CA State Water Board's Low-Threat Case Closure Policy (the Policy), and its development and foundational documents, it is my opinion that this site meets all of the Policy criteria and should be closed. The comparison of site conditions to the Policy criteria, and associated responses to the County's comments, are presented below.

### **Policy General Criteria**

- A. The unauthorized release is located within the service area of a public water system.** Yes. The site is located within the EBMUD system.
- B. The unauthorized release consists only of petroleum.** Yes. Based on all available soil and groundwater analytical data, including a review of the chromatograms, the release is a highly weathered heavy fuel oil (such as Bunker C). No non-petroleum-related constituents are present. A compilation of soil, groundwater and soil vapor sample results are presented in Tables 1 through 3 of the CAP (ERM 2011), which are included in Attachment 2 of the accompanying ERM report.
- C. The unauthorized ("primary") release from the UST system has been stopped.** Yes. The release is presumed to be associated with a UST that was shown on historical maps of the site. The fuel source was changed from fuel oil to natural gas in the early 1970s; therefore, the fuel oil system has not been used for at least 30 years and the

primary release has been stopped. The UST has not been located, but extensive borings were drilled in the former UST location and the UST was not encountered. Therefore, these field data indicate that the UST was likely removed.

- D. Free product has been removed to the maximum extent practicable.** Yes. As summarized in the County's November 2012 letter, although "free product" has been described in boring logs, subsequent well installations and monitoring in 2010 indicated that recoverable free product was not present at the site. To satisfy the County's request for one more round of monitoring, ERM monitored site wells for the presence of free product in January 2013, and no measurable free product was present in any on- or off- site monitoring wells. ERM field logs for the January 2013 monitoring event are included in Attachment 4 of the accompanying ERM report.
- E. A conceptual site model that assesses the nature, extent and mobility of the release has been developed.** Yes. The CSM for this site/release is provided in the CAP (ERM 2011). In summary, this site is an active industrial site that is bordered by commercial and residential land uses. The release was from a fuel oil UST system that was last used in the early 1970s. The petroleum present in the subsurface is a highly weathered heavy fuel oil, which is distributed in soil vertically between the depths of about 12 and 20 feet below ground surface (fbgs), likely due to historical fluctuations in the water table. The lateral distribution of the residual heavy fuel oil in soil has been adequately defined. The residual fuel oil is trapped within the soil pores and no measurable free product is present. Soil, groundwater and soil vapor samples have been collected and the site is adequately characterized. The residual fuel oil is depleted in soluble and volatile constituents due to decades of natural attenuation.
- F. Secondary source has been removed to the extent practicable.** Yes. This criterion has been achieved in-place via natural attenuation. This criterion is intended to "remove or destroy in-place the most readily-recoverable fraction of source area mass" from the subsurface using cost-effective methods over a relatively short period after the primary release has been stopped. The Policy states that additional removal shall not be required unless the residual is acting as a "source" of contamination causing (1) threat to human health or (2) groundwater to exceed low-threat conditions. The residual petroleum at this site is not causing a threat to human health and is not causing groundwater to exceed low-threat conditions:
- Results from grab-groundwater screening samples and dissolved-phase results from site monitoring wells RW-1, RW-2 and RW-3 show that the groundwater does not exceed water quality objectives (WQOs) (CAP Table 2);
  - Soil vapor results show that petroleum constituents are not detected in soil vapor (CAP Table 3);
  - Impacted soil is too deep (greater than 10 fbgs) to be a direct contact threat (CAP Table 1).



Natural attenuation over several decades has destroyed in-place the soluble and volatile components from the residual heavy fuel oil and has performed the function of “secondary source removal.”

- G. Soil and groundwater have been tested for MTBE and results reported in accordance with the Health and Safety Code.** Yes. Approximately 60 soil and 21 groundwater samples have been tested for MTBE (CAP Tables 1 and 2). MTBE has not been detected in soil or groundwater at this site, except for 2 mg/kg in one soil sample, and 0.56 and 1.2 µg/l in two grab-groundwater samples.
- H. Nuisance as defined by Water Code Section 13050 does not exist at the site.** Yes. The residual petroleum in soil is too small in extent and too deep to cause nuisance. It does not meet requirement (1) or (2) of the definition in the Water Code: (1) is injurious to health or indecent or causes obstruction to free use of property, or (2) affects at the same time an entire community or neighborhood or any considerable number of persons. With respect to potential utility trench workers, the residual petroleum occurs at depths of approximately 12 fbgs and greater, and it is my understanding that the deepest utilities adjacent to the site and within the footprint of the impacted soil are shallower than 12 fbgs. Information on underground utilities is included in Attachment 5 of the accompanying ERM report.

### **Policy Media-Specific Criteria**

- 1. Groundwater.** Data from site samples show that groundwater is not impacted by petroleum constituents at concentrations above WQOs (CAP Table 2). Twenty-one (21) of the 23 grab-groundwater screening samples were non-detect for BTEX; 2 samples were non-detect for benzene and ethylbenzene, but had very low concentrations (<2 ug/l) of toluene and xylenes. Many of the grab-groundwater samples reported elevated concentrations of TPH, but these results included a non-dissolved component caused by sample turbidity and were not representative of dissolved concentrations. Higher-quality sample results from monitoring wells installed directly within the impacted soil within the source area (RW-1, RW-2, and RW-3), which therefore represent worst-case conditions, show that the dissolved TPH concentrations also are below WQOs (<100 ug/l diesel-range TPH with silica gel cleanup). The lack of groundwater impact is because of the highly weathered nature and resultant low solubility of the residual heavy fuel oil. The Policy defines a “plume” as groundwater exceeding WQOs, therefore no plume exists at this site and discussions of plume delineation, length, stability, distance to nearest well, etc. are not applicable for this site. The site is low-threat for the groundwater medium by definition in the Policy because the soil “does not contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria in this Policy” (Policy page 7).
- 2. Petroleum Vapor Intrusion (PVI) to Indoor Air.** Soil vapor samples have been collected at this site at a depth of 5 fbgs, and thus the site results can be compared to Policy Scenario 4 for the PVI pathway as shown in the table below.

	Policy Criteria (ug/m3)				Maximum Off-Site Concentration (2010 Data)	Maximum On-Site Concentration (2009 Data)
	No Bioattenuation Zone		With Bioattenuation Zone			
	Res	C/I	Res	C/I		
Benzene	85	280	85,000	280,000	<42	22
Ethylbenzene	1,100	3,600	1,100,000	3,600,000	<58	71
Naphthalene	93	310	93,000	310,000	<25	<25

Notes: Res = residential; C/I = commercial/industrial; ug/m3 = micrograms per cubic meter

Soil vapor samples collected from a depth of 5 fbgs show that petroleum constituents are either not detected (2010 results) or were below the Policy criteria for benzene, ethylbenzene and naphthalene (2009 results for the on-site samples) (CAP Table 3). The 2009 detections for off-site locations (ASV-1 through ASV-5) were proven to be spurious by the 2010 sampling results. The lack of vapor-phase constituents is consistent with the highly weathered nature of the residual heavy fuel oil. Therefore, this site meets the Policy low-threat criteria for the PVI pathway for both the residential and commercial/industrial receptors. The site meets the Policy criteria whether a bioattenuation zone is present or not.

- 3. Direct Contact and Outdoor Air Exposure.** The Policy requires evaluation of soil concentrations for benzene, ethylbenzene, naphthalene and carcinogenic polycyclic aromatic hydrocarbons (c-PAHs) at depth intervals of 0 to 5 fbgs and >5 to 10 fbgs for the direct contact pathway, and provides a table of maximum concentrations that are considered low threat for the residential (Res), commercial/industrial (C/I), and utility trench worker (UTW) scenarios. The applicable scenarios for this site are C/I and UTW. C-PAHs are to be evaluated only for waste oil or heavy fuel oil (Bunker C) releases. Soil sample results for this site are shown on Table 1 of the CAP. A total of 21 soil samples were collected between the depths of 0 and 10 fbgs, with 13 samples at 0 to 5 fbgs and 8 samples at >5 to 10 fbgs. Samples were analyzed for BTEX, other volatile compounds, and also for gasoline-, diesel- and motor oil- range TPH. Samples apparently were not analyzed for naphthalene or for c-PAHs. All soil samples were collected and analyzed prior to adoption of the Policy.

Soil sample results show that the 0 to 10 fbgs depth interval is virtually unimpacted by residual heavy fuel oil (which would be measured as total “TPH”). Only one of the 21 samples had total TPH concentrations greater than 100 mg/kg (136 mg/kg for sample BH-3-7.5’), which is an indication of whether residual fuel oil is even possibly present in soil. BTEX were not detected in any of the 21 soil samples. Although naphthalene and

## Zemo & Associates

c-PAHs were not analyzed for as would be appropriate for a heavy fuel oil release, this is not a data gap for this site because naphthalene and c-PAHs cannot exceed the Policy criteria if the residual fuel oil is not present in the 0 to 10 fbg depth interval.

Therefore, site soil conditions meet Policy criteria for the direct contact pathways for both the C/I and UTW scenarios.

### Summary

This evaluation shows that site conditions meet all General and Media-Specific criteria in the Low-Threat Closure Policy and, therefore, the site poses low-threat to human health, safety and the environment and satisfies case closure requirements.

Please contact me if you have any questions about this evaluation.

Sincerely yours,

ZEMO & ASSOCIATES



Dawn A. Zemo, P.G. 4824, C.E.G.1747  
Principal Hydrogeologist

DAZ/sas

### **References**

ERM, 2011. Corrective Action Plan. April 7.

ERM, 2012. Human Health Risk Evaluation. March 2.

ERM, 2012. Corrective Action Plan - Closure Evaluation. October 8.

ACEHD, 2012. Case File Review. November 1.

CA State Water Resources Control Board, Resolution 2012-0016: Low-Threat UST Case Closure Policy

*Attachment 2*  
*Soil, Groundwater and Soil*  
*Vapor Tables*

Table 1  
Soil Sampling Data  
Lucasey Site - 2744 E. 11th Street  
Oakland, California

Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds									Total Petroleum Hydrocarbons		
			Benzene	Toluene	Ethyl-benzene	Xylenes (Total)	MTBE	EDB	1,2-DCA	TCE	PCE	TPH (as Gasoline)	TPH (as Diesel)	TPH (as Motor Oil)
ESL*			0.044	2.9	3.3	2.3	0.023	NA	0.0045	0.46	0.7	83	5000**	5000**
BH-1	12	07/09/05	<0.005	<0.005	<0.005	<0.005	<0.05	-	-	-	-	<1	22	83
BH-1	16	07/09/05	<0.005	<0.005	<0.005	<0.005	<0.05	-	-	-	-	4.8	48	46
BH-2	12	07/09/05	<0.5	<0.5	<0.5	<0.5	<5	-	-	-	-	700	8,900	7,500
BH-3	7.5	07/09/05	<0.005	<0.005	<0.005	<0.005	<0.05	-	-	-	-	7.4	50	79
BH-4	12	07/09/05	<0.02	<0.02	<0.02	0.23	2	-	-	-	-	89	2,800	3,000
BH-6	12	07/09/05	<0.005	<0.005	<0.005	<0.005	<0.05	-	-	-	-	<1	41	53
BH-6	16	07/09/05	<0.05	<0.05	<0.05	<0.05	<0.5	-	-	-	<0.50	73	1,800	1,700
SB7-5	5	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB7-17.5	17.5	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB7-23	23	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB8-5	5	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB8-15	15	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB8-23.5	23.5	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB8-26.5	26.5	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB9-5	5	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB9-10	10	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB9-11.5	11.5	01/09/07	VP	-	-	-	-	-	-	-	-	-	-	-
SB9-16	16	01/22/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	140	93
SB9-18	18	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	18	<50
SB9-22	22	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB10-5	5	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB10-12	12	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB10-23	23	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB11-5	5	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB11-12	12	01/10/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	11	3,300	2,500
SB11-22	22	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB11-23.5	23.5	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB12-5	5	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB12-11	11	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	370	85
SB12-14	14	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	470	270
SB12-26	26	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB12-34	34	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	1.4	170	<50
SB13-5	5	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB13-10	10	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50

Table 1  
Soil Sampling Data  
Lucasey Site - 2744 E. 11th Street  
Oakland, California

Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds									Total Petroleum Hydrocarbons			
			Benzene	Toluene	Ethyl-benzene	Xylenes (Total)	MTBE	EDB	1,2-DCA	TCE	PCE	TPH (as Gasoline)	TPH (as Diesel)	TPH (as Motor Oil)	
SB13-14	14	01/08/07	VP	-	-	-	-	-	-	-	-	-	-	-	-
SB13-18	18	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB13-26	26	01/22/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	170	110
SB13-30	30	01/08/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB14-10.5	10.5	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB14-11.5	11.5	01/12/07	VP	-	-	-	-	-	-	-	-	-	-	-	-
SB14-13.5	13.5	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB14-17	17	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	14	3,800	2,500
SB14-23	23	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB15-5	5	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB15-15	15	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	21	5,300	3,400
SB15-19.5	19.5	01/22/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	36	20
SB15-23	23	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	18	1,800	1,100
SB15-27	27	01/09/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB21-5	5	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB21-10	10	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB21-11	11	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	1.0	770	800
SB21-13.5	13.5	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	520	630
SB21-22	22	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB22-10	10	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB22-11.5	11.5	01/24/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	4.3	2,600	3,800
SB22-15	15	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB23-5	5	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB23-15	15	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB23-23	23	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1	<10	<50
SB23-29	29	01/11/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
SB24-5	5	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	23	<50
SB24-11.5	11.5	01/19/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	29.0	2,300	3,600
SB24-18	18	01/12/07	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	<1	<10	<50
B-1 - 4.5 - 5	4.5 - 5	03/04/10	<0.005	<0.005	<0.005	<0.010	-	-	-	-	-	-	<0.1	<9.5	<19
B-1 - 9.5 - 10	9.5-10	03/04/10	<0.0049	<0.0049	<0.0049	<0.0098	-	-	-	-	-	-	<0.098	<9.9	<20
B-1 - 15.5 - 16	15.5-16	03/04/10	<0.005	<0.005	<0.005	<0.099	-	-	-	-	-	-	<0.099	<10	<20
B-1 - 19.5 - 20	19.5-20	03/04/10	<0.005	<0.005	<0.005	<0.010	-	-	-	-	-	-	<0.1	<19	<38
B-2 - 4.5 - 5	4.5 - 5	03/04/10	<0.005	<0.005	<0.005	<0.099	-	-	-	-	-	-	<0.099	<10	<20
B-2 - 9.5 - 10	9.5-10	03/04/10	<0.005	<0.005	<0.005	<0.099	-	-	-	-	-	-	<0.099	<9.9	<20
B-2 - 15.5 - 16	15.5-16	03/04/10	<0.0049	<0.0049	<0.0049	<0.0098	-	-	-	-	-	-	<0.098	<9.9	<20
B-2 -20 -20.5	20-20.5	03/04/10	<0.005	<0.005	<0.005	<0.099	-	-	-	-	-	-	<0.099	<10	<20

**Key:**

Concentrations reported in milligrams per kilogram (mg/kg)

**Bold** results exceed the ESL.

- Not analyzed for this compound

< = less than; compound not detected at the laboratory reporting limit

VP = Consultant reported sample contained visible product, therefore not run for analysis at laboratory

\* San Francisco Regional Water Quality Control Board Environmental Screening Levels for deep soils (>3 meters), ground water potentially used for drinking water, commercial/industrial land use

\*\* review of chromatograms indicates the TPH quantified is highly weathered heavy fuel oil, therefore the ESL for TPH residual fuels is applied

Table 2  
Ground Water Sampling Data  
Lucasey Site - 2744 E. 11th Street  
Oakland, California

Sample ID	Sample Date	Volatile Organic Compounds					Total Petroleum Hydrocarbons				
		Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	MTBE	TPH (as Gasoline)	TPH (as Diesel)	TPH (as Motor Oil)	TPH (as mineral spirits)	TPH (as kerosene)
ESL*		1	40	30	20	5	100	100	100	100	100
<b>Grab Ground Water Samples</b>											
SB-1W	08/31/04	<0.5	<0.5	<0.5	<0.5	<0.5	650	520,000	520,000	-	-
SB-2W	08/31/04	<0.5	<0.5	<0.5	<0.5	<0.5	2,200	110,000	89,000	-	-
SB-3W	08/31/04	<0.5	<0.5	<0.5	<0.5	<0.5	<50	<50	<250	-	-
SB-4W	08/31/04	<0.5	<0.5	<0.5	<0.5	<0.5	3,800	560,000	410,000	-	-
SB-6W	08/31/04	<0.5	<0.5	<0.5	<0.5	<0.5	130	8,700	6,900	-	-
BH-2	07/09/06	<0.5	<0.5	<0.5	<0.5	<0.5	310	580,000	510,000	-	-
BH-4	07/09/06	<0.5	<0.5	<0.5	<0.5	<0.5	<50	160,000	150,000	-	-
BH-5	07/09/06	<0.5	<0.5	<0.5	<0.5	<0.5	<50	670	2,800	-	-
SB7-W	01/11/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	<50	<500	-	-
SB8-W	01/10/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	3	<500	-	-
SB9-W	01/09/07	VP	-	-	-	-	-	-	-	-	-
SB8-W23.5	01/10/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	390	<500	-	-
SB10-W16	01/10/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	<50	<500	-	-
SB10-W23	01/10/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	340	<500	-	-
SB11-W	01/09/07	VP	-	-	-	-	-	-	-	-	-
SB12-W	01/09/07	VP	-	-	-	-	-	-	-	-	-
SB13W (18')	01/22/07	<0.5	<0.5	<0.5	0.84	<0.5	560	5,800,000	3,000,000	-	-
SB13W2 (26")	01/22/07	<0.5	<0.5	<0.5	<0.5	0.56	150	140,000	70,000	-	-
SB14-W	01/12/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	11,000	4,500	-	-
SB15W	01/09/07	VP	-	-	-	-	-	-	-	-	-
SB21-W17	01/11/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	730	<500	-	-
SB21-W26	01/11/07	<0.5	0.54	<0.5	1.7	1.2	<25	1,500	580	-	-
SB22-W12	01/12/07	VP	-	-	-	-	-	-	-	-	-
SB23-W	01/11/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	2,800	1,500	-	-
SB23-W23	01/11/07	<0.5	<0.5	<0.5	<0.5	<0.5	<25	630	<500	-	-
SB24-W	01/23/07	<0.5	<0.5	<0.5	<0.5	<0.5	1400	430,000	210,000	-	-
B-1-15-25	03/04/10	<1	<1	<1	<2	-	<50	<97	<190	<97	<97
B-2-15-25	03/04/10	<1	<1	<1	<2	-	<50	<98	<200	<98	<98
<b>Product Recovery Well Samples</b>											
RW-1	06/08/09	-	-	-	-	-	-	58/<50 <sup>1</sup>	-	-	-
RW-2	06/08/09	-	-	-	-	-	-	140/<50 <sup>1</sup>	-	-	-
RW-3	06/08/09	-	-	-	-	-	-	210/88 <sup>1</sup>	-	-	-

**Key:**

Concentrations reported in micrograms per liter (µg/L)

\* San Francisco Regional Water Quality Control Board Environmental Screening Levels, ground water potentially used for drinking water

Bolded results exceed the ESL

VP - visible product reportedly observed in sample

- Not analyzed for this compound

< = Less than; compound not detected at the laboratory reporting limit

<sup>1</sup> 1st value without silica gel cleanup, 2nd value with silica gel cleanup

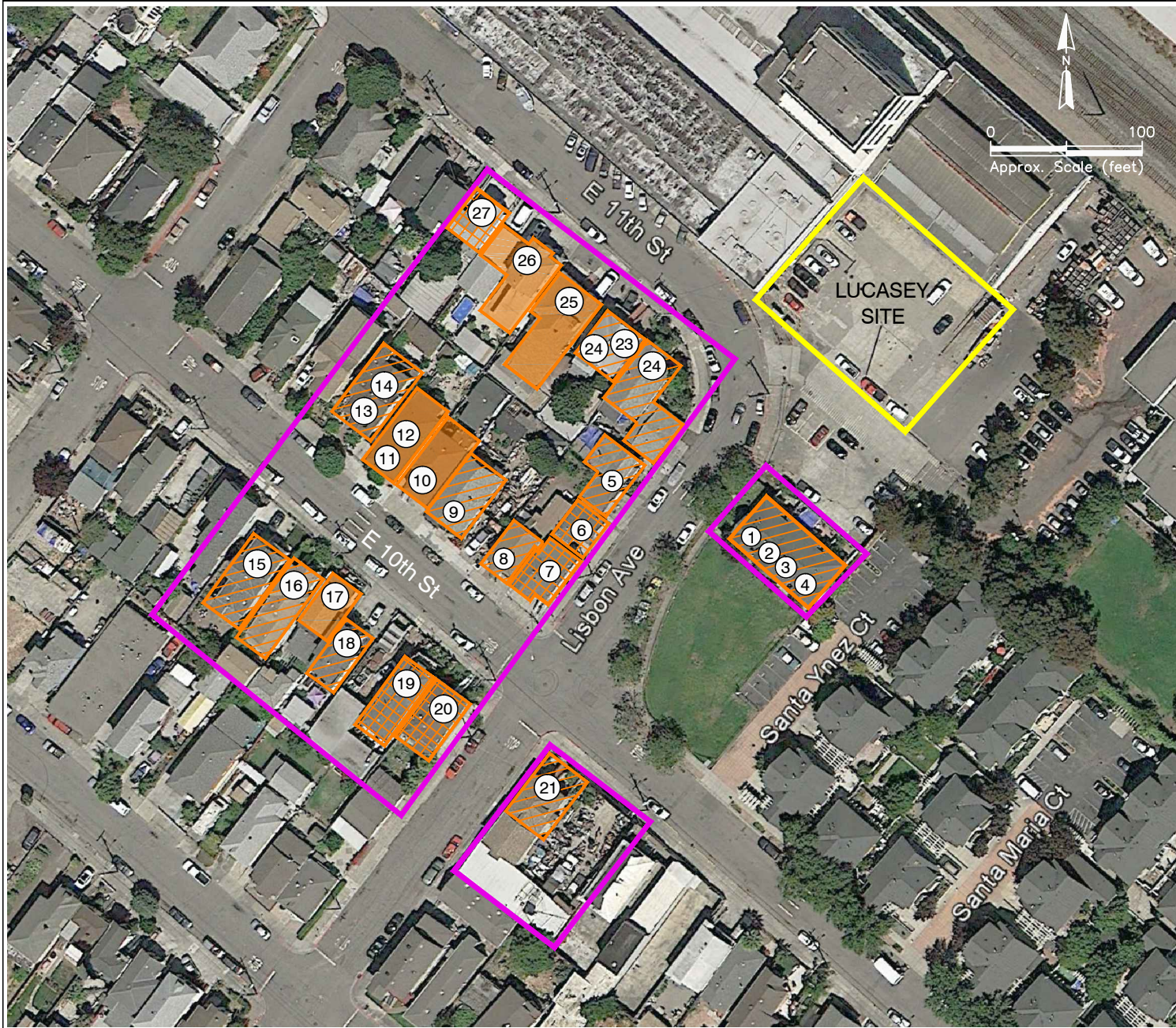
**Table 3**  
**Soil Vapor Sampling Results**  
**Lucasey Site - 2744 E. 11th Street**  
**Oakland, California**

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Naphthalene	TPHg	TPHd	Methylene Chloride	Acetone	1,2,4-Trimethyl benzene	Carbon Disulfide	2-Butanone	Ethanol
CHHSL-residential		36.2	135,000	-	319,000	315,000	31.9	-	-	-	-	-	-	-	-
CHHSL-commercial		122	378,000	-	887,000	879,000	106	-	-	-	-	-	-	-	-
ESL-residential		84	63,000	980	21,000	21,000	72	10,000	10,000	5,200	660,000	-	-	1,000,000	-
ESL-commercial		280	180,000	3,300	58,000	58,000	240	29,000	29,000	17,000	1,800,000	-	-	2,900,000	-
ASV-1	06/17/09	150	2,100	130	280	47	<48	NA	NA	NA	NA	NA	NA	NA	NA
ASV-1 duplicate	06/17/09	170	2,200	140	310	52	<97	NA	NA	NA	NA	NA	NA	NA	NA
ASV-2	06/17/09	110	2,900	250	810	180	<46	NA	NA	NA	NA	NA	NA	NA	NA
ASV-3	06/17/09	740	20,000	1,900	7,000	1,800	<460	NA	NA	NA	NA	NA	NA	NA	NA
ASV-4	06/17/09	570	22,000	2,600	10,000	2,900	<470	NA	NA	NA	NA	NA	NA	NA	NA
ASV-5	06/17/09	33	690	62	230	69	<31	NA	NA	NA	NA	NA	NA	NA	NA
ASV-6	06/18/09	14	470	44	180	55	<24	NA	NA	NA	NA	NA	NA	NA	NA
ASV-7	06/18/09	21	700	70	290	90	<25	NA	NA	NA	NA	NA	NA	NA	NA
ASV-7 duplicate	06/18/09	22	720	71	290	88	<25	NA	NA	NA	NA	NA	NA	NA	NA
ASV-8	06/18/09	18	690	54	220	72	<25	NA	NA	NA	NA	NA	NA	NA	NA
ASV-9	06/18/09	12	500	55	230	70	<24	NA	NA	NA	NA	NA	NA	NA	NA
ASV-10	06/18/09	12	370	40	160	54	<23	NA	NA	NA	NA	NA	NA	NA	NA
ASV-11	06/18/09	15	480	49	200	65	<23	NA	NA	NA	NA	NA	NA	NA	NA
Ambient air	06/18/09	4	7	<4.7	<4.7	<4.7	<23	NA	NA	NA	NA	NA	NA	NA	NA
Ambient air	05/10/10	<36	<43	<50	<50	<50	<25	<940	<5,000	<40	50J	<56	<36	<34	12J
ASV-12	05/10/10	<36	39J	<49	37J	<49	<25	<920	<5,000	<39	72J	27J	<35	<33	290
ASV-12 duplicate	05/10/10	<36	38J	<49	39J	<49	<25	<920	<5,000	<39	79J	27J	<35	<33	230
ASV-13	05/10/10	<36	<42	<49	<49	<49	<25	<920	<5,000	<40	<110	<56	<36	<34	100
ASV-14	05/24/10	<42	<50	<58	<58	<58	<25	<1,100	<5,000	<46	510	77	71	71	<100
ASV-14 duplicate	05/24/10	<42	<49	<57	<57	<57	<270	<1,100	<5,000	<46	340	74	83	70	<99
ASV-15	05/24/10	<42	<50	<58	<58	<58	<25	<1,100	<5,000	1,800	<130	<65	<41	<39	150
Lab Blank	05/19/10	<16	<19	<22	<22	<22	35J	<410	<5,000	<17	<48	23J	<16	<15	6J

**Key:**  
CHHSL = OEHHA California Human Health Screening Levels for Soil Gas  
ESL = SF Bay Regional Water Quality Control Board Environmental Screening Levels  
NA = Not analyzed  
- = No numerical value established  
Concentrations reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )  
**Bold** values exceed one or more of ESL or CHHSL criteria  
< = Less than; compound not detected at the laboratory reporting limit  
J = Estimated value



*Attachment 3*  
*Door-to-Door Survey and*  
*Revised Human Health Risk*  
*Evaluation/Assessment*



**LEGEND**

- Lucasey Site
- Survey Areas
- No Basement Present
- Basement/Subgrade Space Present
- No Response

ID	Address
1	1001 Santa Inez Court
2	1011 Santa Inez Court
3	1021 Santa Inez Court
4	1031 Santa Inez Court
5	1021 Lisbon Avenue
6	1011 Lisbon Avenue
7	2748 E 10th Street
8	2742 E 10th Street
9	2736 E 10th Street
10	2732 E 10th Street
11	2728 E 10th Street
12	2730 E 10th Street
13	2720 E 10th Street
14	2722 E 10th Street
15	2721 E 10th Street
16	2725 E 10th Street
17	2733 E 10th Street
18	2737 E 10th Street
19	2745 E 10th Street
20	2749 E 10th Street
21	2801 E 10th Street
22	2743 E 11th Street
23	2739 E 11th Street
24	2741 E 11th Street
25	2735 E 11th Street
26	2731 E 11th Street
27	2721 E 11th Street

**Figure 1**  
*Door-to-Door Survey  
Lucasey Manufacturing  
2744 East 11th Street  
Oakland, California*

Door to Door Survey Lucasey Manufacturing		
Address	Date/ Initial	Notes
2721 East 11 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2731 East 11 <sup>th</sup> Street	January 10 2013	Basement/ subgrade room approx. 18' x 35' 5' to 5.5' below grade Use: Laundry No sump or well
2735 East 11 <sup>th</sup> Street	January 10 2013	Basement/ subgrade room approx. 20' x 40' 3' to 4' below grade Use: Living space for children No sump or well
2739 East 11 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2741 East 11 <sup>th</sup> Street	January 11 2013	No basement, sump or well
2743 East 11 <sup>th</sup> Street	January 11 2013	No basement, sump or well
1001 Santa Inez Court	January 10 2013	Four unit building No basement, sump or well
1011 Santa Inez Court	January 11 2013	Four unit building No basement, sump or well
1021 Santa Inez Court	January 11 2013	Four unit building No basement, sump or well
1031 Santa Inez Court	January 10 2013	Four unit building No basement, sump or well
2720/2722 East 10 <sup>th</sup> Street	January 10 2013	Two unit building No basement, sump or well
2721 East 10 <sup>th</sup> Street	January 11 2013	No basement, sump or well
2725 East 10 <sup>th</sup> Street	January 11 2013	No basement, sump or well
2728 East 10 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2730 East 10 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2732 East 10 <sup>th</sup> Street	January 10 2013	Basement/ subgrade room approx. 18' x 40' 3' to 4' below grade Use: Storage No sump or well
2733 East 10 <sup>th</sup> Street	January 10 2013	Basement/ subgrade room 2.5' to 3' below grade Use: Storage

		Dimensions unknown due to language issue Sump and well unknown due to language issue
2736 East 10 <sup>th</sup> Street	January 10 2013	No basement, sump or well
2737 East 10 <sup>th</sup> Street	January 11 2013	No basement, sump or well
2742 East 10 <sup>th</sup> Street	January 10 2013	No basement, sump or well
2745 East 10 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	Three attempts – Unable to approach due to locked gate & dog on porch
2748 East 10 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2749 East 10 <sup>th</sup> Street	January 10 2013 January 11 2013 January 14 2013	No answer at door No answer at door No answer at door
2801 East 10 <sup>th</sup> Street	January 10 2013	No basement, sump or well
1011 Lisbon	January 10 2013 January 11 2013 January 14 2013	Three attempts- Unable to approach due to dog on porch
1021 Lisbon	January 10 2013	No basement, sump or well

Notes:

- Door to door survey performed by Jim Leist III and Stephen Ferencz on January 10, January 11, & January 14 2013.
- Survey data collection sheets not completed for address with no answer at door.

# Memorandum

Environmental  
Resources  
Management

**To:** John Moe, Paul Hausmann

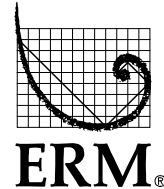
**From:** ERM Health, Ecology and Risk Services Practice;  
Mark Bowland

**Date:** 3/01/2013

**Subject:** Human Health Risk Assessment/Evaluation;  
Lucasey Site

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2525 Natomas Park Drive  
Suite 350  
Sacramento, CA 95833  
(916) 924-9378  
(916) 920-9378 (fax)



The intent of this memorandum is to transmit to you the results of the human health screening and indoor air evaluation for Lucasey Site, Oakland California. The screening assessment was focused on determining if residual concentrations of total petroleum hydrocarbons (TPH) in soil vapor and groundwater in offsite locations may present potential human health risks to current and future potential receptors.

The assessment/evaluation was conducted consistent with Cal/EPA Department of Toxic Substances Control (DTSC) 2011, Office of Environmental Health Hazard Assessment (OEHHA, 2005) and San Francisco Regional Water Quality Control Board (RWQCB, 2008) guidance. The technical information used in the assessment, and the results and conclusions are summarized below.

## Off-site Data Review

**Soil.** Soils were sampled at three off site locations proximal to the off-site residents: SB-22, SB-21, and B-2. Samples were collected at these locations in profiled fashion such that vertical delineation of chemical concentrations could be observed, and analyzed for petroleum hydrocarbons (TPH), volatile organic compounds (VOCs, including benzene, toluene, ethylbenzene, xylenes [BTEX], and oxygenates such as MTBE). At location B-2, no VOCs or TPH were detected in any samples collected from 5 to 20 feet below ground surface (BGS). In SB-21, nominal concentrations of TPH-gasoline (TPH-G, 1 mg/kg @ 11 feet bgs) and TPH-diesel (TPH-D, 770 mg/kg and 520 mg/kg at 11 ft bgs and 13.5 ft bgs respectively) were detected. In B-2, no concentrations of TPH were detected in any of the samples collected. In SB-22, nominal concentrations of TPH-G (4.3 mg/kg at 11.5 feet bgs) and low concentrations of TPH-D (2,600 mg/kg at 11.5 ft bgs). All concentrations were below ESLs (assuming groundwater is not a drinking water supply). However more importantly, no VOCs were detected in any of the samples collected at these three locations.

As described in the corrective action plan (ERM, 2011), the most likely source of the residual TPH is a UST identified during the AEI Phase I. The fuel oil UST was likely not used after the early 1970s, because the cannery operating at the site switched over to natural gas at that time. Therefore, the oil source (and driving head) has not been present for more than 30 years. Furthermore, as part of the corrective action plan evaluation chromatograms for the previous investigations were examined, and the review indicated that the TPH detected in the samples is a highly weathered heavy fuel oil. This is consistent with the observations noted in the soil samples described above, that is, no detected VOC concentrations associated with detected TPH concentrations.

**Groundwater.** Groundwater was sampled at several off site locations proximal to the off-site residents: PMW-3, SB-22, SB-21, and B-2. In SB-22 and PMW-3, visible product was noted in at least one event. While only a single event was conducted at SB-22, as noted in the PMW-3 product rapidly attenuated over time and was not observed after one month of monitoring.

In samples collected at SB-21, no TPH-G and low concentrations of TPH-D (0.73 to 1.5 mg/L) were detected. No health-risk-based ESLs are available for TPH for the potentially complete pathways to off-site receptors (vapor intrusion only); the ESL tables recommend the use of soil vapor measurements.

No VOCs were detected in SB-21-W17, and nominal concentrations of toluene, ethylbenzene, and xylenes were detected in SB-21-W26 (well below groundwater to indoor air ESLs presented in Table F-1b of the ESL document, SFRWQCB, 2008). Neither TPH nor VOCs were detected in sample B-2.

These data collectively suggest that nominal amounts of product are potentially (if at all) present in off-site locations, and any product present is so weathered as to render it effectively immobile and absent of significant amounts of VOCs.

**Soil Vapor.** Soil vapor was sampled at several off site locations proximal to the off-site residents: ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15. In locations ASV-3, ASV-4, and ASV-5, VOCs were detected and included BTEX. In locations ASV-3 and ASV-4, benzene (740 ug/m<sup>3</sup> and 570 ug/m<sup>3</sup>) and ethylbenzene (1,900 ug/m<sup>3</sup> and 2,600 ug/m<sup>3</sup>) concentrations were greater than one or more CHHSL or ESL values. In ASV-5, all detected BTEX concentrations were below CHHSLs and ESLs.

ASV-14 and ASV-15 are located closest to the potentially exposed receptors and therefore are considered by ERM to be most representative of potential exposure source concentrations. In ASV-14 and ASV-15, BTEX and TPH were not detected, and other VOCs (methylene chloride, acetone) when detected were substantially lower than their respective ESLs. Based on these comparisons it is considered unlikely that chemicals detected in soils proximal to the off-site residences present a significant risk to off-site receptors.

### **Receptors of Potential Concern**

In accordance with HRA guidance, current and future land uses were considered when developing the identification of people (i.e., receptors) that could potentially be exposed to chemicals at the offsite. Currently, the area contains single family residences; thus the current and future potential on-site receptors include residents.

### **Indoor Air Modeling**

While comparison of ASV-14 and ASV-15 (located closest to the potentially exposed receptors and considered most representative of potential exposures) results to ESLs indicates that detected chemical concentrations in soil vapor are unlikely to represent a significant risk to off-site receptors, several tiered quantitative evaluations were undertaken.

### **Tier 1 Modeling**

Flux estimates of VOCs soil vapor and dispersion into indoor air were determined using the spreadsheet-based model developed by USEPA (2003; herein referred to as the J&E model). This model is based on the vapor intrusion model published by Johnson and Ettinger (1991). The J&E vapor intrusion model is a screening-level model, which incorporates both convective and diffusive mechanisms for estimating the transport of constituent VOCs emanating from subsurface soils (and subsequently groundwater by transfer) into indoor spaces located above the potential source of these chemicals. The model is constructed to calculate steady-state vapor transport (infinite source).

**Soil Types.** Based on soil characteristics and the cross sections presented in the CAP (ERM, 2011), for offsite areas loamy sand was selected to represent ground surface to 4 feet bgs, and silt was selected to represent 4 to 5 feet bgs.

**Soil Characteristics.** Default soil physical parameters present in the model for each soil type were utilized in the modeling.

**Building Characteristics.**

Based upon a recent door to door survey, residences were identified as having both slab on grade as well as subgrade/basement type components (ERM, 2013). The residences located closest to the facility were identified as having slab on grade construction. One residence located proximal to the field sample points was identified as having living space located approximately three to four feet below ground surface. Subsequently, two building scenarios were evaluated: slab on grade, and basement.

For the slab on grade scenario, as a conservative measure, the default values recommended in vapor intrusion guidance (SFRWQCB, 2008; DTSC, 2011) were incorporated for the following model parameters: depth below grade to the bottom of enclosed floor space, enclosed floor space thickness, soil-building pressure differential, enclosed space floor length, enclosed space floor width, enclosed space height, floor-wall seam crack width, indoor air exchange rate, and average vapor flow rate into building.

For the basement scenario, as described above default values were utilized for all building parameters except “depth below grade to bottom of enclosed floor space.” For this parameter, a value of 3.5 feet bgs (106.7 cm) was utilized based on observations for the residence located proximal to the field sample locations.

Values for residential modeling parameters are presented in Table 2.

**Source Concentrations.** Two evaluations were conducted:

1. Modeling of the maximum detected concentrations of chemicals selected from all vapor sample locations proximal to off-site areas, including ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15, and
2. Modeling of the maximum detected concentrations of chemicals selected from vapor sample locations closest to potential receptors (considered most relevant in assessing potential off-site exposures) - ASV-14, and ASV-15.

All data collected from these locations were collected from 5 feet bgs.



## Tier 2 Modeling

There is significant uncertainty in the modeling of TPH related constituents into indoor air. USEPA and other authors have identified specific uncertainties and limitations of the J&E model for providing robust analytical solutions for the vapor intrusion to indoor air pathway for TPH-related compounds. More specifically, one of the greatest concerns is that the J&E model does not sufficiently account for attenuation and biodegradation of petroleum related compounds during migration through the vadose zone:

“EPA is not recommending that the J&E Model be used for sites contaminated with petroleum products...The J&E Model does not account for contaminant attenuation (biodegradation, hydrolysis, sorption, and oxidation/reduction). Attenuation is potentially a significant concern for these type of sites” (USEPA 2003).

“An empirical field study (Fitzpatrick and Fitzgerald 1997) indicated that the model may be overly conservative for nonchlorinated species (e.g., benzene, toluene, ethylbenzene and xylene) ...The authors contribute the likely cause for this discrepancy is the significant biodegradation of the nonchlorinated compounds” (USEPA 2003a).

“...Second, aerobic biodegradation was deemed significant in determining the observed profiles at a large proportion of sites. This observation...can be used to argue that predictive models not accounting for biodegradation could overestimate the risks from upward vapor fluxes by 10-10,000 times at some sites” (Roggemans et al. 2001).

Biodegradation is a potentially significant attenuation process for vapors not accounted for in the J&E model. However, the API BioVapor model (2010; v2.0) was utilized to further assess the migration potential of petroleum hydrocarbons into off-site residences, specifically to evaluate whether bioattenuation would be expected to significantly reduce migration potential of benzene and ethylbenzene into indoor air. The BioVapor model utilizes the same mechanistic approach for estimating

potential indoor air concentrations, while estimating the potential bioattenuation of organic vapors to take place<sup>1</sup>.

The same inputs utilized in the J&E model were utilized in the BioVapor model. The results of the modeling (estimated indoor air concentration of benzene from ASV-3 and ethylbenzene from ASV-4) are presented in Table 2.

### Exposure Assessment

Default values for exposure parameters and exposure equations (similar to those utilized in the J&E model) were utilized in the evaluation, and are presented in Table 3.

### Toxicity Assessment

Toxicity assessment is the process of describing the potential for a chemical to cause both cancer and/or non-cancerous effects (for example liver effects). Standard Cal/EPA (Office of Environmental Health Hazard Assessment; OEHHA; 2012) and USEPA (2012) toxicity criteria are applied in the present risk assessment. These criteria were selected in accordance with the following regulatory hierarchy:

1. Cal/EPA OEHHA Toxicity Criteria Database;
2. IRIS;
3. USEPA's Provisional Peer Reviewed Toxicity Values;
4. National Center for Environmental Assessment (NCEA, or other current USEPA sources);

For COPCs for which both Cal/EPA and USEPA toxicity criteria exist, the most conservative value is utilized. All toxicity criteria applied in the present risk assessment for indoor air, are presented in Tables 4 and 5.

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<sup>1</sup> The BioVapor model also estimates the indoor air concentration assuming bioattenuation does not occur; the model estimated the indoor air concentrations under these conditions that are essentially identical to those estimated by the J&E model.

## **Results**

The results of the vapor modeling and hazard/risk estimates are presented in Table 2.

### **Tier 1 Modeling**

**Conservative proximal soil vapor samples - Slab On Grade.** The hazard indices (HI) associated with assumed residential indoor air exposure to maximum detected soil gas concentrations in ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15 was 0.12. This is less than the target value of 1.0.

The incremental lifetime cancer risk (ILCR) associated with the maximum detected concentrations in ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15 was  $8 \times 10^{-6}$ . This is consistent with the most conservative end of the USEPA (1990) acceptable risk range ( $10^{-4}$  to  $10^{-6}$ ). It should be noted that this estimate is based on the assumption that the benzene concentrations from ASV-3 are potentially relevant source concentrations for off-site resident modeling. However, samples collected immediately adjacent to off-site residences (ASV-14 and ASV-15) are non-detect for benzene and ethylbenzene. Therefore, while the evaluation is overly conservative because it does not reflect potential source concentrations relevant to the receptor of interest (ASV-3 and ASV-4), the evaluation still indicates that estimated risks are within the acceptable range.

**Conservative proximal soil vapor samples - Basement Scenario.** The hazard indices (HI) associated with assumed residential indoor air (with a basement) exposure to maximum detected soil gas concentrations in ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15 was 0.12. This is less than the target value of 1.0.

The incremental lifetime cancer risk (ILCR) for a structure with a basement associated with the maximum detected concentrations in ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15 was  $8 \times 10^{-6}$ . This is consistent with the most conservative end of the USEPA (1990) acceptable risk range ( $10^{-4}$  to  $10^{-6}$ ).

As described above, this estimate does not account for the fact that immediately adjacent samples to off-site residences (ASV-14 and ASV-15) are non-detect for benzene and ethylbenzene, and does not reflect potential source concentrations relevant to the receptor of interest (ASV-3 and ASV-4).

**Relevant proximal soil vapor samples - Slab on Grade.** The HI associated with assumed residential indoor air exposure to maximum detected soil gas concentrations in ASV-14 and ASV-15 was 0.0029. This is less than the target value of 1.0.

The ILCR associated with the maximum detected concentrations in ASV-14 and ASV-15 was  $5 \times 10^{-7}$ . This is less than the most conservative end of the USEPA (1990) acceptable risk range ( $10^{-4}$  to  $10^{-6}$ ). Due to their proximity to off-site receptors, these locations are considered the most relevant for estimating potential source concentrations that may intrude into indoor air.

**Relevant proximal soil vapor samples - Basement Scenario.** The HI associated with assumed residential indoor air exposure to maximum detected soil gas concentrations in ASV-14 and ASV-15 was 0.0043. This is less than the target value of 1.0.

The ILCR associated with the maximum detected concentrations in ASV-14 and ASV-15 was  $7 \times 10^{-7}$ . This is less than the most conservative end of the USEPA (1990) acceptable risk range ( $10^{-4}$  to  $10^{-6}$ ). Due to their proximity to off-site receptors, these locations are considered the most relevant for estimating potential source concentrations that may intrude into indoor air.

### Tier 2 Modeling

The results of the BioVapor modeling for the maximum detected benzene and ethylbenzene proximal concentrations in ASV-3 and ASV-4 are also presented in Table 2. The results indicate that bioattenuation of potential TPH vapors as they migrate through the vadose zone represents a significant attenuating mechanism. For the slab on grade scenario, estimated HI (0.000000098) and ILCR ( $4 \times 10^{-11}$ ) are five orders of magnitude less than those estimated using the J&E model. For the basement scenario, estimated HI (0.00068) and ILCR ( $3 \times 10^{-7}$ ) are greater than an order of magnitude less than those estimated using the J&E model.

The results of the modeling efforts provides lines of evidence to suggest that detected concentrations of petroleum related hydrocarbons in the subsurface proximal to off-site residences are unlikely to pose a significant risk to human health.

### Conclusions

The following lines of evidence were developed as part of this evaluation:

- The TPH source has not been present for more than 30 years;
- CAP (ERM, 2011) review of chromatograms indicated TPH is a highly weathered heavy fuel oil; subsequently, significant VOC concentrations are not expected;
  - This is consistent with the observations noted in the soil samples collected off-site; no detected VOC concentrations associated with detected TPH concentrations;
- Concentrations of TPH have been observed in off-site groundwater in PMW-3, SB-22, SB-21, but not in B-2. In PMW-3, a small amount of product was observed when the well was first installed, but rapidly attenuated over a one month period and was not observed again over the following 9 month period;
  - These data suggest if nominal amounts of product are present in off-site locations it is weathered sufficiently to render it effectively immobile and absent of significant amounts of VOCs (also observed in the groundwater data);
- Soil vapor samples collected generally proximal to off-site locations (ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15) have demonstrated low concentration of VOCs;
- Results of conservative Tier 1 modeling of soil vapor samples generally proximal to off-site locations (ASV-3, ASV-4, ASV-5, ASV-14, and ASV-15) demonstrated conservative risk estimates consistent with the most conservative end of the USEPA acceptable risk range;
- Soil vapor samples collected immediately proximal to off-site locations (ASV-14 and ASV-15) have detected nominal concentrations of VOCs that are substantially less than ESLs, with no detected concentrations of BTEX;
- Results of conservative Tier 1 modeling of soil vapor samples immediately proximal to off-site locations (ASV-14 and ASV-15) demonstrated conservative risk estimates significantly less than the most conservative end of the USEPA acceptable risk range;
- Results of Tier 2 modeling of measured benzene and ethylbenzene in soil vapor at ASV-3 and ASV-4 demonstrates the significant bioattenuation potential for petroleum hydrocarbons and estimated

risks are significantly less than acceptable risk levels (5 orders of magnitude less).

Based upon these multiple lines of evidence, the conclusion that detected concentrations of petroleum hydrocarbons in off-site locations are not likely to present a significant risk to off-site receptors is well supported.

### **Limitations**

The conclusions presented in this report are professional opinions based upon the data collected for the property, and approaches and analysis methods presented in SFRWQCB (2008) and OEHHA (2005) guidance in the evaluation of such properties. Opinions provided herein apply to the currently available data and existing and reasonably foreseeable conditions at the time of ERM's assessment. They cannot necessarily apply to changes in site conditions of which this office is unaware and has not had the opportunity to evaluate. Changes in the conditions at the property may occur with time due to natural processes or works of man on the property or adjacent properties. Changes in applicable standards may also occur as a result of legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated, wholly or in part, by changes beyond our control.

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**Table 1**  
**Indoor Air Modeling Inputs - Onsite**  
**Lucasey Site - 2744 E. 11th Street**  
**Oakland, California**

Parameter	Value	Reference	
Depth to soil vapor (cm)	152		
<b>Soil Characteristics</b>			
Average soil/gw temperature (C)	18.0	USEPA, 2003	
Stratum A thickness (cm) - slab on grade	122	Measured	Stratum A
Stratum A vadose zone soil type	LS	Measured; Loamy sand (silty sand)	
Vadose zone dry bulk density (g/cm <sup>3</sup> )	1.62	Default	
Vadose zone total porosity (unitless)	0.390	Default	
Vadose zone water-filled porosity (unitless)	0.076	Default	
Vadose zone air-filled porosity (unitless)	0.314	Default	
Stratum B thickness (cm) - slab on grade	30	Measured	Stratum B
Stratum B vadose zone soil type	Si	Measured; silt	
Vadose zone dry bulk density (g/cm <sup>3</sup> )	1.35	Measured	
Vadose zone total porosity (unitless)	0.489	Measured	
Vadose zone water-filled porosity (unitless)	0.167	Measured	
Vadose zone air-filled porosity (unitless)	0.322	Measured	
<b>Building Characteristics</b>			
Depth below grade to bottom of enclosed floor space (cm)	15	DTSC Default for slab on grade	
Depth below grade to bottom of enclosed floor space (cm)	106.68	Conservative estimate based on door to door survey - basement scenario	
Air exchange rate (1/hr)	1.00	SFRWQCB, 2008	
Average vapor flow rate into interior space, Q <sub>soil</sub> (L/m)	5.0	DTSC Default	
Enclosed space length (cm)	1,000	DTSC Default	
Enclosed space width (cm)	1,000	DTSC Default	
Enclosed space height (cm)	244	DTSC Default for slab on grade	
Enclosed space height (cm)	366	USEPA default for basement, confirmed by door to door survey	
Building Pressure Differential (cm)	40	DTSC Default	

Table 2  
Residential Soil Vapor Model Results and Risk Estimates - Indoor Air - Slab on Grade Construction  
Lucasey Site - 2744 E. 11th Street  
Oakland, California

Chemical	Maximum Offsite Vapor Concentration (µg/m <sup>3</sup> )	Location of Maximum	Indoor Air Concentration (µg/m <sup>3</sup> )	Average Daily Concentration (mg/m <sup>3</sup> )	Lifetime Average Daily Concentration (µg/m <sup>3</sup> )	Reference Concentration (mg/m <sup>3</sup> )	Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	Hazard Index <sup>a</sup>	Cancer Risk <sup>b</sup>
<b>ASV-3, ASV-4, ASV-5, ASV-14, ASV-15 - Slab on Grade Construction</b>									
Benzene	7.4E+02	ASV-3	4.6E-01	4.4E-04	1.9E-01	3.0 E-2	2.9 E-5	1.5 E-2	6 E-6
Ethylbenzene	2.6E+03	ASV-4	1.5E+00	1.4E-03	6.1E-01	1.0 E+0	2.5 E-6	1.4 E-3	2 E-6
Methylene chloride	1.8E+03	ASV-15	1.2E+00	1.1E-03	4.9E-01	4.0 E-1	1.0 E-6	2.9 E-3	5 E-7
Toluene	2.2E+04	ASV-4	1.4E+01	1.3E-02	NA	3.0 E-1	NA	4.4 E-2	NA
m,p-Xylene	1.0E+04	ASV-4	5.5E+00	5.3E-03	NA	1.0 E-1	NA	5.3 E-2	NA
o-Xylene	2.9E+03	ASV-4	1.8E+00	1.7E-03	NA	1.0 E-1	NA	1.7 E-2	NA
<b>Total</b>								<b>1.2 E-1</b>	<b>8 E-6</b>
<b>ASV-3, ASV-4, ASV-5, ASV-14, ASV-15 - Basement Construction - 3.5 feet BGS</b>									
Benzene	7.4E+02	ASV-3	4.7E-01	4.5E-04	1.9E-01	3.0 E-2	2.9 E-5	1.5 E-2	6 E-6
Ethylbenzene	2.6E+03	ASV-4	1.6E+00	1.5E-03	6.6E-01	1.0 E+0	2.5 E-6	1.5 E-3	2 E-6
Methylene chloride	1.8E+03	ASV-15	1.2E+00	1.1E-03	4.9E-01	4.0 E-1	1.0 E-6	2.8 E-3	5 E-7
Toluene	2.2E+04	ASV-4	1.4E+01	1.3E-02	NA	3.0 E-1	NA	4.5 E-2	NA
m,p-Xylene	1.0E+04	ASV-4	6.0E+00	5.8E-03	NA	1.0 E-1	NA	5.8 E-2	NA
o-Xylene	2.9E+03	ASV-4	1.8E+00	1.8E-03	NA	1.0 E-1	NA	1.8 E-2	NA
<b>Total</b>								<b>1.2 E-1</b>	<b>8 E-6</b>
<b>ASV-14, ASV-15 (Closest to residences) - Slab on Grade Construction</b>									
Benzene	<42		NA	NA	NA	3.0 E-2	2.9 E-5	NA	NA
Ethylbenzene	<57		NA	NA	NA	1.0 E+0	2.5 E-6	NA	NA
Methylene chloride	1.8E+03	ASV-15	1.2E+00	1.1E-03	4.9E-01	4.0 E-1	1.0 E-6	2.9 E-3	5 E-7
Toluene	<50		NA	NA	NA	3.0 E-1	NA	NA	NA
m,p-Xylene	<57		NA	NA	NA	1.0 E-1	NA	NA	NA
o-Xylene	<57		NA	NA	NA	1.0 E-1	NA	NA	NA
<b>Total</b>								<b>2.9 E-3</b>	<b>5 E-7</b>
<b>ASV-14, ASV-15 (Closest to residences) - Basement Construction - 3.5 feet bgs</b>									
Benzene	<42		NA	NA	NA	3.0 E-2	2.9 E-5	NA	NA
Ethylbenzene	<57		NA	NA	NA	1.0 E+0	2.5 E-6	NA	NA
Methylene chloride	1.8E+03	ASV-15	1.2E+00	1.1E-03	4.9E-01	4.0 E-1	1.0 E-6	2.8 E-3	5 E-7
Toluene	<50		NA	NA	NA	3.0 E-1	NA	NA	NA
m,p-Xylene	<57		NA	NA	NA	1.0 E-1	NA	NA	NA
o-Xylene	<57		NA	NA	NA	1.0 E-1	NA	NA	NA
<b>Total</b>								<b>2.8 E-3</b>	<b>5 E-7</b>
<b>ASV-3 BioVapor Model-Slab on Grade Construction</b>									
Benzene	7.4E+02	ASV-3	3.1E-06	2.9E-09	1.3E-06	3.0 E-2	2.9 E-5	9.8 E-8	4 E-11
Ethylbenzene	2.6E+03	ASV-4	2.2E-05	2.1E-08	9.0E-06	1.0 E+0	2.5 E-6	2.1 E-8	2 E-11
<b>Total</b>								<b>9.8 E-8</b>	<b>4 E-11</b>
<b>ASV-3 BioVapor Model-Basement Construction 3.5 feet bgs</b>									
Benzene	7.4E+02	ASV-3	2.1E-02	2.0E-05	8.7E-03	3.0 E-2	2.9 E-5	6.8 E-4	3 E-7
Ethylbenzene	2.6E+03	ASV-4	8.9E-02	8.6E-05	3.7E-02	1.0 E+0	2.5 E-6	8.6 E-5	9 E-8
<b>Total</b>								<b>6.8 E-4</b>	<b>3 E-7</b>

<sup>a</sup> Per RAGS F (2009); Hazard Index = Concentration (µg/m<sup>3</sup>)/(1000 mg/µg) / Reference concentration (mg/m<sup>3</sup>) x 24 hr/d x 350 d/yr x 30 yrs/(30 yrs x 365 d/yr x 24 hr/day).

<sup>b</sup> Per RAGS F (2009); Cancer Risk = Concentration (µg/m<sup>3</sup>) x Unit risk factor (µg/m<sup>3</sup>)<sup>-1</sup> x 24 hr/d x 350 d/yr x 30 yrs/(70 year x 365 d/y x 24 hr/d).

NA = not assessed/not analyzed

Zero values for concentration indicate the chemical was not detected and is not quantified here. The detection limits are discussed in the uncertainty section of the report.

**Table 3**  
**Resident Exposure Parameters**  
**Lucasey Site - 2744 E. 11th Street**  
**Oakland, California**

<b>Parameter</b>	<b>Abbrev.</b>	<b>Value</b>	<b>Units</b>	<b>Reference</b>
Averaging time, carcinogenic	AT <sub>c</sub>	70	years	SFRWQCB, 2008; USEPA 2002
Resident exposure frequency	E <sub>Fr</sub>	350	days/year	SFRWQCB, 2008; USEPA 2002
Exposure duration, Resident	ED <sub>r</sub>	30	years	SFRWQCB, 2008; USEPA 2002
Exposure Time	ET <sub>res</sub>	24	hours/day	
Hours per day		24	hours/day	

Key:

SFRWQCB = Regional Water Quality Control Board, San Francisco Bay Region

USEPA = United States Environmental Protection Agency

*Table 4*  
**Noncancer Toxicity Criteria**  
**Lucasey Site - 2744 E. 11th Street**  
**Oakland, California**

<b>Inhalation - Chronic (mg/m<sup>3</sup>)</b>		
<b>Chemical</b>	<b>Value</b>	<b>Reference</b>
<b>Non-Carcinogenic</b>		
Benzene	3.0 E-2	USEPA, 2012
Ethylbenzene	1.0 E+0	USEPA, 2012
Methylene chloride	4.0 E-1	OEHHA 2012
Toluene	3.0 E-1	OEHHA 2012
Xylene	1.0 E-1	USEPA, 2012

**Notes and Key:**

NA = Not applicable. Data either not applicable (e.g., not carcinogenic), not available, or chemical not assessed for this pathway.

USEPA = United States Environmental Protection Agency

OEHHA = Office of Environmental Health Hazard Assessment

**Table 5**  
**Carcinogenic Toxicity Criteria**  
**Lucasey Site - 2744 E. 11th Street**  
**Oakland, California**

Chemical	Inhalation (ug/m <sup>3</sup> ) <sup>-1</sup>	
	Value	Reference
<b>Carcinogenic</b>		
Benzene	2.9 E-5	OEHHA 2012
Ethylbenzene	2.5 E-6	OEHHA 2012
Methylene chloride	1.0 E-6	OEHHA 2012
Toluene	NA	
Xylene	NA	

**Notes and Key:**

NA = Not applicable. Data are either not applicable for this chemical (e.g., not carcinogenic),

OEHHA = Office of Environmental Health Hazard Assessment

USEPA = United States Environmental Protection Agency

# Homes Included in Door-to Door Survey

Address

Completed (Initial/Date)

2721 East 11<sup>th</sup> Street

JF 1/10/13 No answer

• 2731 "

JF 1/10/13

• 2735 "

JF 1/10/13

2739/2741 " 2741 (lower)

JF 1/10/13 No answer

2743 "

JF 1/10/13 No answer

~~2720 East 11<sup>th</sup> Street~~

~~2728 "~~

~~2732 "~~

~~2736 "~~

~~2742 "~~

~~2748 "~~

1001 Santa Inez Court

JF 1/10/13

1011 "

JF 1/10/12 No answer

1021 "

JF 1/10/13 No answer

1031 "

JF 1/10/13 Language issue

hisban 1021  
1011

~~992 Lisbon Avenue~~

JF 1/10/13

2715 East 10<sup>th</sup> Street

SE 1/10/13

No answer / dog on porch

2719• "

JF 1/10/13 No answer

2723 "

2729• "

2739• "

2745 "

JF 1/10/13 Gate locked could not reach door

2751• "

2742 E10th ST

JF 1/10/13

2748 E10th ST

JF 1/10/13 No answer

2736 E10th ST

JF 1/10/13

2732 E10th ST

JF 1/10/13

2730 E10th ST

JF 1/10/13 No answer

2728 E10th ST

JR 1/10/13 No answer

2720/2722 E10th ST

JF 1/10/13

2733 E10th street

JF 1/10/13

2737 E10th street

JF 1/10/13 No answer

2749 E10th street

JF 1/10/13 No answer

2801 E10th street

JF 1/10/13

• = did not find in survey area

DRAFT

Survey Data Collection Sheet

Tenant Name: Toni Caro Phone No.: \_\_\_\_\_

Address: 2731 E 11<sup>th</sup> Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): \_\_\_\_\_

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one):  Yes  No  Do not know

Dimensions of basement/sub-grade space: 18' x 35'

Current use of the basement/subsurface space if present: Laundry

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one):  Yes  No  Do not know

Number of wells: 1

Well diameter:                     

Well depth:                     

Well material (circle one):  PVC plastic  Steel  Brick/Clay  Other \_\_\_\_\_

Date of installation:                     

Frequency of use:                     

Use of water from well:                     

(circle one):  water landscaping  swimming pool  household use  other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: Sophia Lupian Phone No.: 510-436-7572  
Address: 2735 Ellith Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): \_\_\_\_\_

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one):  Yes  No  Do not know

Dimensions of basement/sub-grade space: 20' x 40' approx

Current use of the basement/subsurface space if present: living space for children

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No  Do not know

Number of wells: —

Well diameter: —

Well depth: —

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: —

Frequency of use: —

Use of water from well: —

(circle one): water landscaping swimming pool household use other (list above)

Note: subgrade space (bottom floor) ~3' below ground surface



DRAFT

Survey Data Collection Sheet

Tenant Name: Unknown (4 houses) Phone No.: none obtained

Address: 1001, 1011, 1021, 1031

APN: \_\_\_\_\_

Owner Name (if other than tenant): Unknown

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  **No**  Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  **No**  Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic  Steel  Brick/Clay  Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_  
(circle one): water landscaping  swimming pool  household use  other (list above)

Note: All 4 units part of same complex. Only 1001 & 1031 answered door. 1001 was only one who answered questions. 1031 spoke only Chinese.

DRAFT

Survey Data Collection Sheet

Tenant Name: Francisco Navarro Phone No.: \_\_\_\_\_

Address: 2801 E 10th Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): brother of owner (May live on property)

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  No  Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No  Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one): water landscaping swimming pool household use other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: (did not offer name) Phone No.: \_\_\_\_\_

Address: 2433 E 10th Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): Unknown

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes No Do not know

Dimensions of basement/sub-grade space: did not explain use

Current use of the basement/subsurface space if present: Storage

Is a sump present?: Unknown

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes No Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one): water landscaping swimming pool household use other (list above)

Note: Very little English, hard to communicate

DRAFT

Survey Data Collection Sheet

Tenant Name: Jesus De Leon Phone No.: \_\_\_\_\_

Address: 2720/2722 E 10th Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): \_\_\_\_\_

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  No  Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No  Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_  
(circle one): water landscaping swimming pool household use other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: Miguel Naho Phone No.: \_\_\_\_\_

Address: 1021 Lisbon Ave

APN: \_\_\_\_\_

Owner Name (if other than tenant): Unknown

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  No  Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No  Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one): water landscaping swimming pool household use other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: Ignacio Navarro Phone No.: \_\_\_\_\_

Address: 2736 E10<sup>th</sup> Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): \_\_\_\_\_

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  No Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one): water landscaping swimming pool household use other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: Jose Chavez Phone No.: \_\_\_\_\_

Address: 2742 E 10th Street

APN: \_\_\_\_\_

Owner Name (if other than tenant): Unknown

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one): Yes  No Do not know

Dimensions of basement/sub-grade space: \_\_\_\_\_

Current use of the basement/subsurface space if present: \_\_\_\_\_

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one): Yes  No Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one): PVC plastic Steel Brick/Clay Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one): water landscaping swimming pool household use other (list above)

DRAFT

Survey Data Collection Sheet

Tenant Name: Carlos Davalos Phone No.: \_\_\_\_\_

Address: 2732 E10th St

APN: \_\_\_\_\_

Owner Name (if other than tenant): Owner

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Basement/Subgrade Space

Is there a basement or subgrade space under the house on the property?  
(circle one):  Yes  No  Do not know

Dimensions of basement/sub-grade space: 18'x40' (size of home footprint)

Current use of the basement/subsurface space if present: storage

Is a sump present?: No

Water Well

Is there a current or abandoned well(s) on the property?  
(circle one):  Yes  No  Do not know

Number of wells: \_\_\_\_\_

Well diameter: \_\_\_\_\_

Well depth: \_\_\_\_\_

Well material (circle one):  PVC plastic  Steel  Brick/Clay  Other \_\_\_\_\_

Date of installation: \_\_\_\_\_

Frequency of use: \_\_\_\_\_

Use of water from well: \_\_\_\_\_

(circle one):  water landscaping  swimming pool  household use  other (list above)



*Attachment 4*  
*Free Product Monitoring*

Product Monitoring  
 Lucasy Manufacturing  
 2744 East 11th Street  
 Oakland, California

Personnel Stephen F., Jim L

Date 1-10-13  
 Time ~ 10 AM - 12:15 PM

Safety Checklist Review the HASP

- Do you have a copy of the HASP
- Did you notify anyone onsite/offsite
- Do you know the potential Hazards
- Do you have proper PPE

Well	Depth to Water (feet)	Depth to Product (feet)	Product Thickness (feet)	Notes
PMW-1A	8.31	none	NA	SW in Well box, Bolt broke in box
PMW-1B	8.35	none	NA	
PMW-2A	9.8	none	None/NA	Wellbox full of SW
PMW-2B	11.67	None	NA	Bailer in well
PMW-3	8.15	none	NA	Bailer in Well, particles of dirt in suspension
RW-1	7.44	none	NA	Bailer in well
RW-2	9.6	none	NA	Water cloudy with dirt particles
RW-3	10.25	none	NA	Bailer in well. Product droplets on outside of bailer where contact was made with well casing

Observations

Only well where sign of product was found was RW-3. No hit with interface probe but outside of bailer came up with some product smears. Most likely product was on surface of well casing above water table -> explains why there was no product in water but how our bailer came up with signs of product.

\* left bailer in well, all wells but PMW 2A now have bailers in well for future site investigations

*Attachment 5*  
*Underground Utilities*

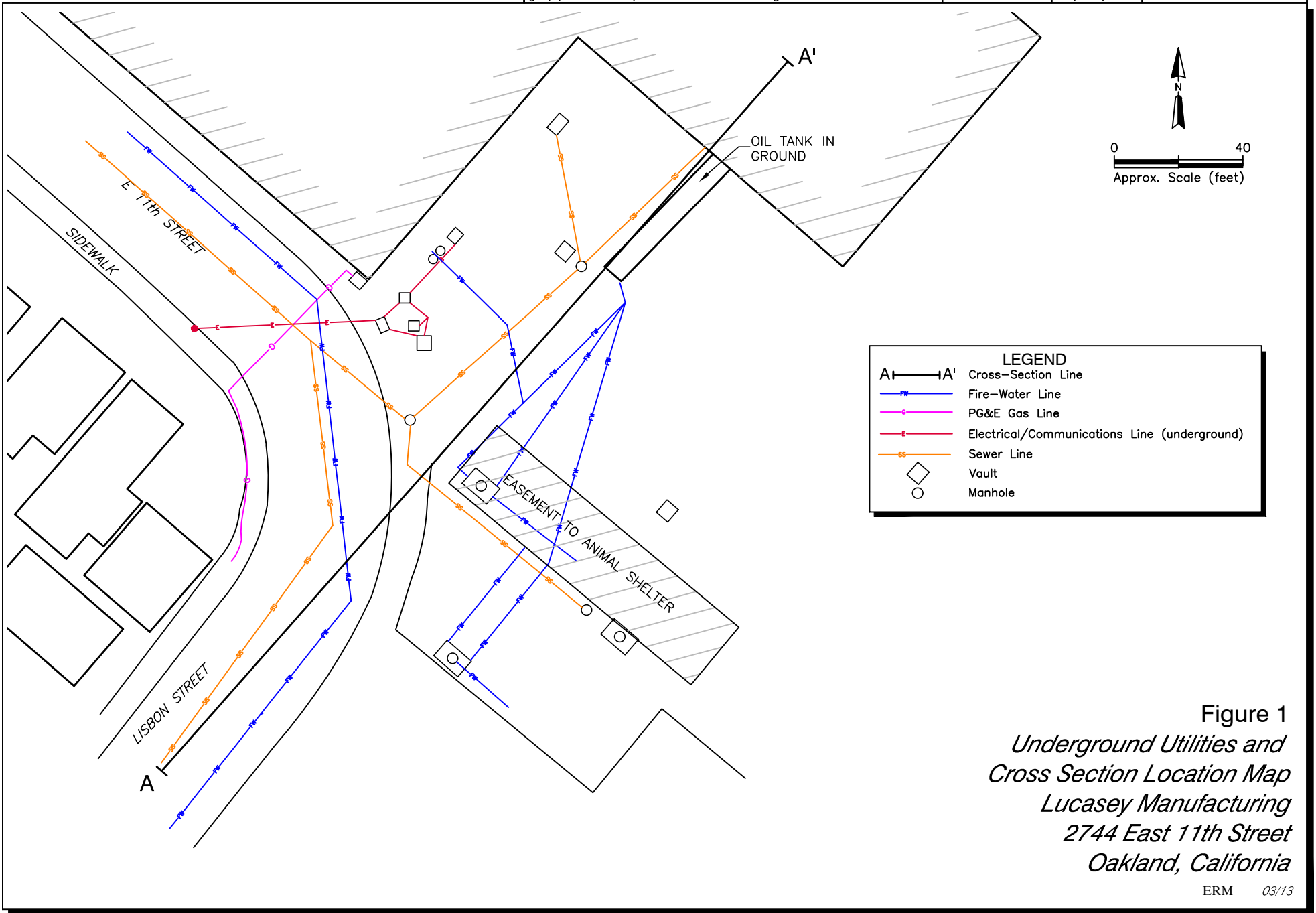
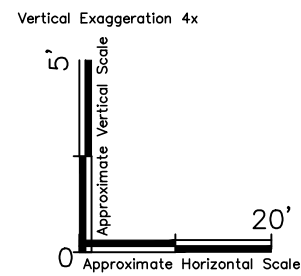
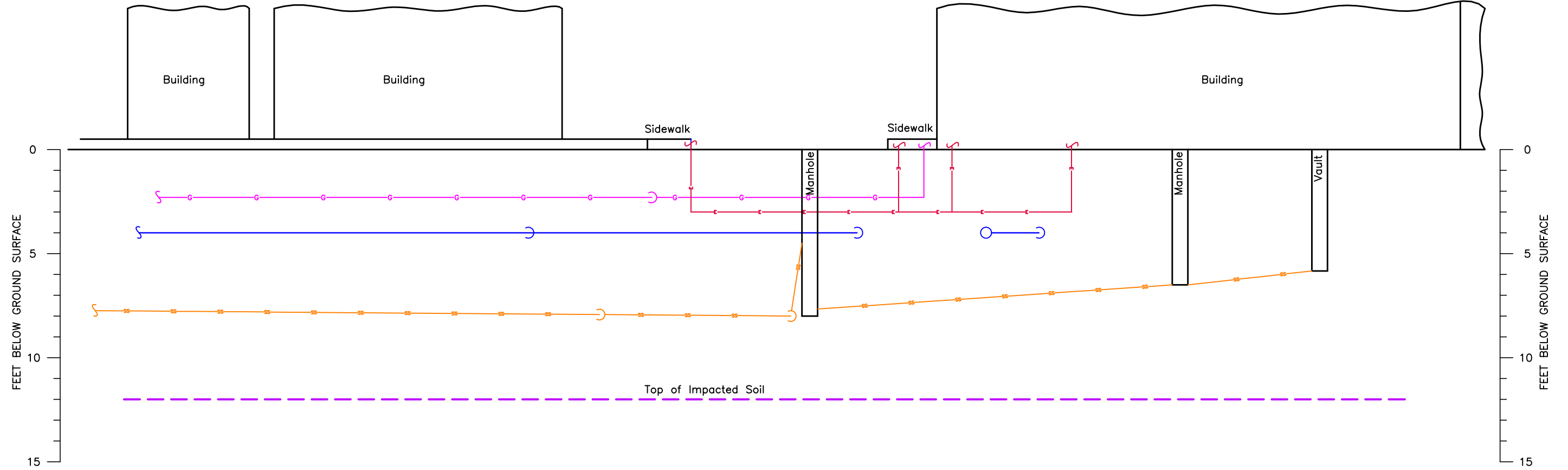


Figure 1  
*Underground Utilities and  
Cross Section Location Map  
Lucasey Manufacturing  
2744 East 11th Street  
Oakland, California*

A  
Southwest

A  
Northeast



LEGEND	
	Fire-Water Line
	PG&E Gas Line
	Electrical/Communications Line (underground)
	Sewer Line

Figure 2  
Cross Section A-A'  
Lucasey Manufacturing  
2744 East 11th Street  
Oakland, California

SUBDIV. TITLE \_\_\_\_\_ NO. \_\_\_\_\_  
 AREA Oakland # 621  
 PRESSURE ZONE Central GOA  
 JUSTIFICATION Repl. w/c size

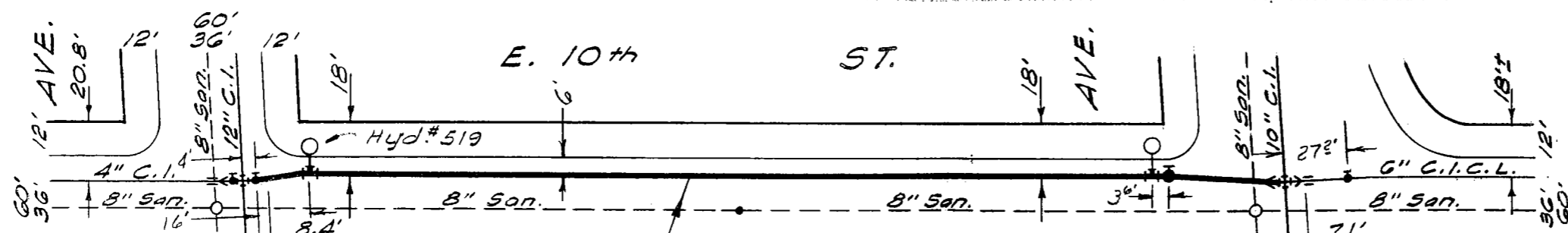
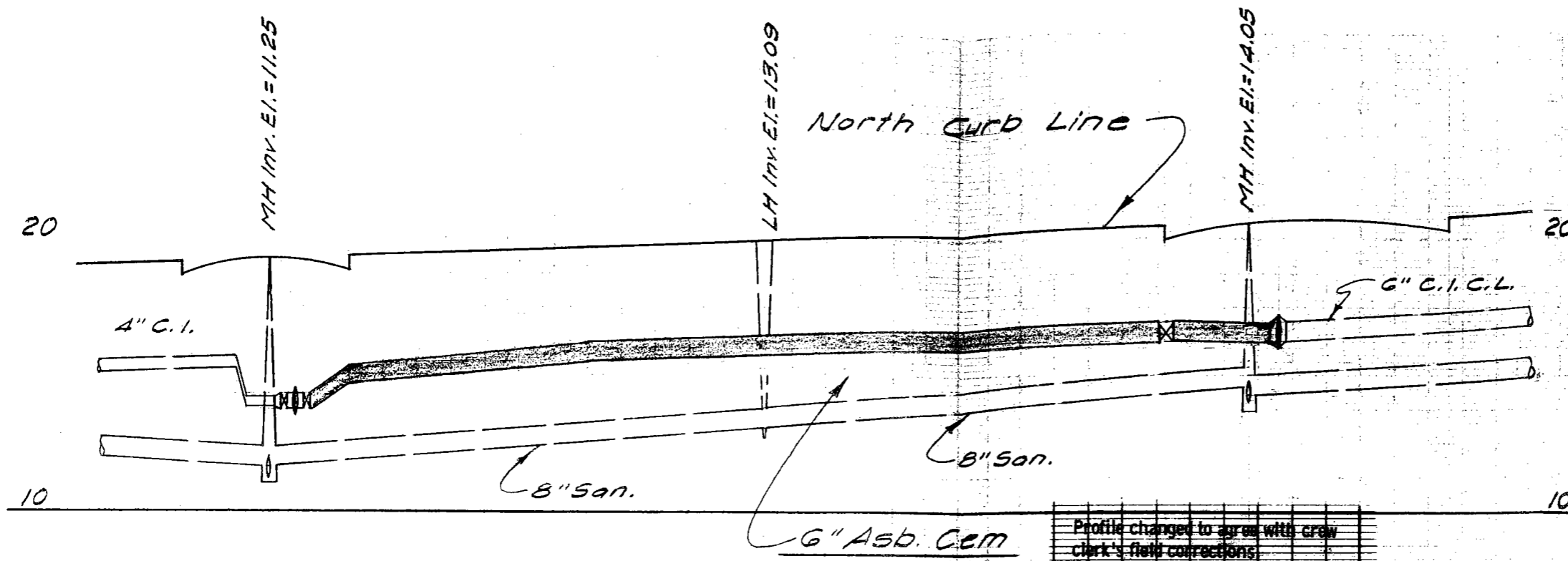
WORK ORDER 35058  
 MAP NO. 15-A-1497B408  
 REFERENCE HD 948-A, 92440

UTILITY DISTRICT

RECOMMENDED BY O.F. Eide  
 APPROVED BY [Signature]

EAST BAY MUNI

PREPARED BY [Signature]  
 DRAWN BY Dr. Wong  
 CHECKED BY O.F. Eide



1497B-408

MAPPED 100' HW Jr.

NOTES

CAST IRON ELLS 22 1/2° OR GREATER AND TEES ANCHOR PER DWG. 1165-A  
 CAST IRON FITTINGS AND VALVES CEMENT MORTAR COATED UNLESS OTHERWISE NOTED

SERVICE IMPROVEMENT NO. 3103

**AS BUILT**  
 STARTED 22 May 59 IN SERVICE 17 Jun. 59  
 COMPLETED 17 Jun. 59  
 RECORDED Stables APPROVED Cross  
 REVISED 13 Feb. 61 BY TD. Gage

35058  
 0+00 6" Gate (exist) c=53 Beg. 6" Riser  
 0+02 5" End 6" Riser Beg. 6" AC  
 0+15.5E R/L 27th Ave.  
 0+16 6" Tee C=47 Reconnect Exist Hyd. 6" Gate, 6"x4" Red., H. & S.  
 1+00 c=43  
 2+00 c=43  
 3+00 c=42  
 3+16 6" Tee c=43 Hyd No. 18457  
 3+20 6" Gate c=42 M. Echo. at 20 Turns NW R Lisbon Ave.  
 LISBON  
 3+49 8" End 6" Asb. Cem. 12" G" End 10"x6" Reducer H. & S.  
 3+57 10" Tee (exist) c=40

35058  
 357' 6" Asb. Cem.

SCALE 1" = 50' (H), 1" = 5' (V)

DATE 3-24-59

PAVING Asphalt Concrete

MAPPED	YARD	WALL	200	400	TAP
		R.Y.S.	R.Y.S.		R.Y.S.

JOINTS \_\_\_\_\_  
 MAKE OF PIPE \_\_\_\_\_  
 CONSTRUCTION BY District Forces  
 CONTRACT NO. \_\_\_\_\_

13 Feb 61  
 TDG

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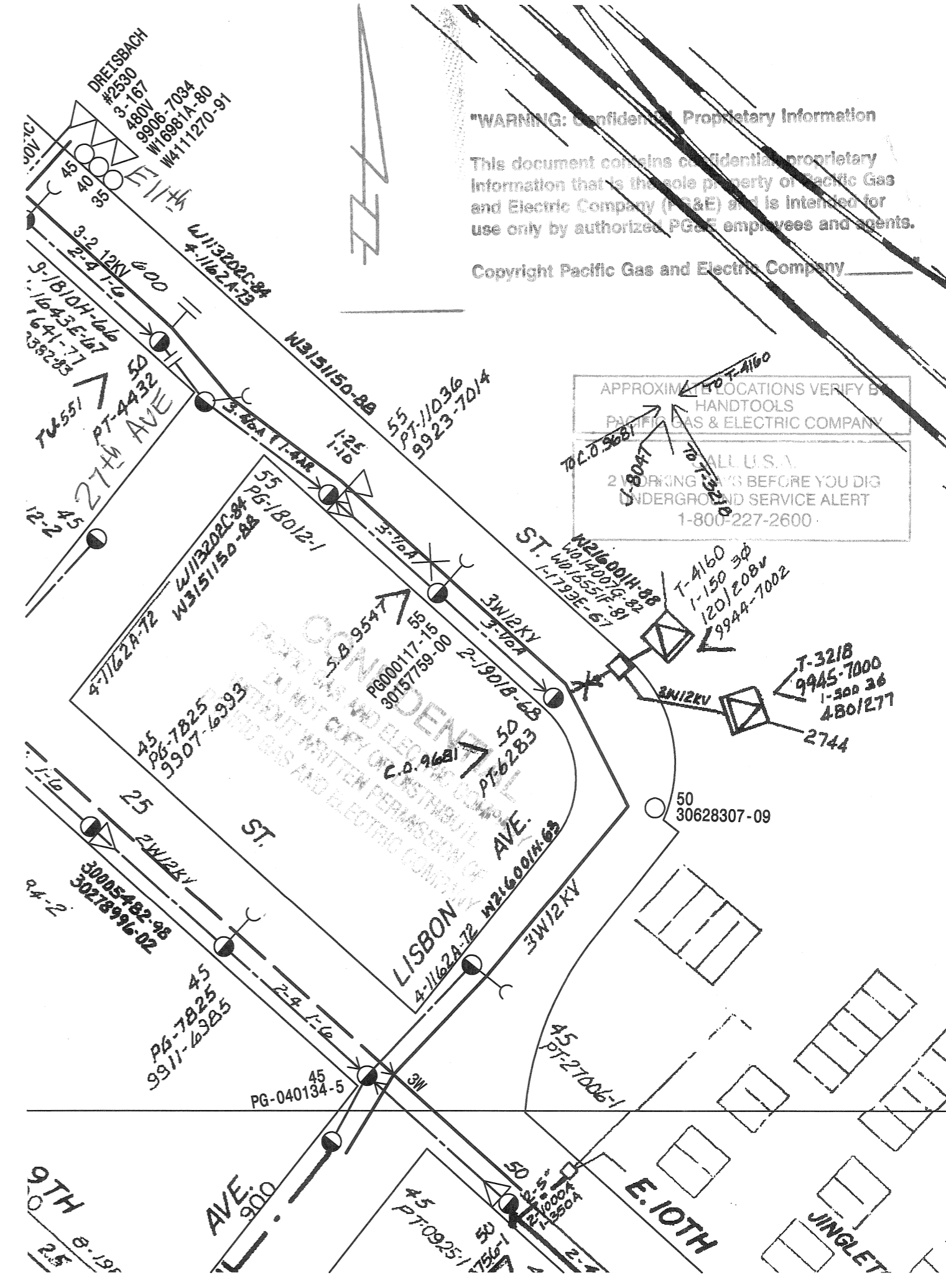
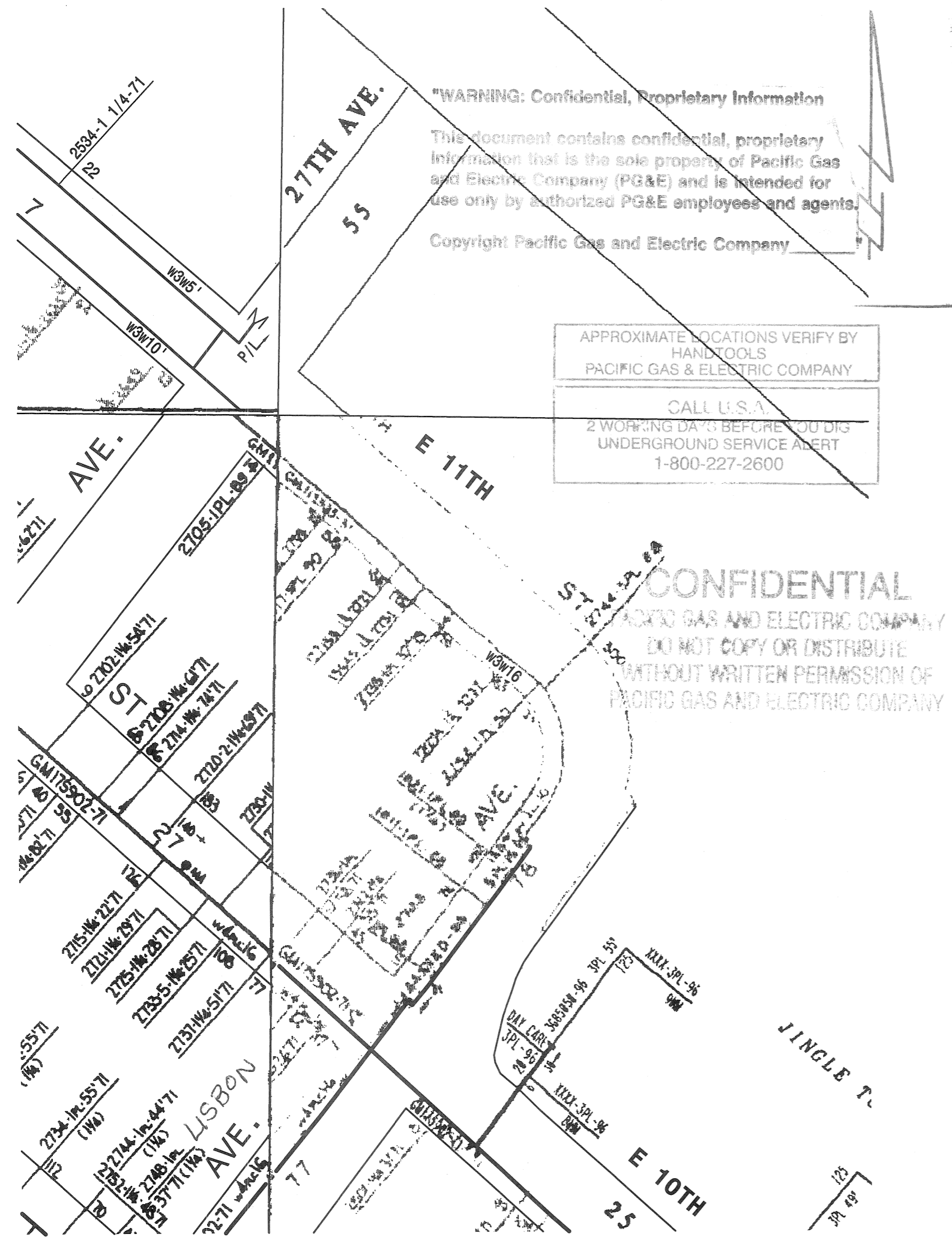
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1-800-227-2600



CITY Oakland

MAP NO. ~~J~~ **T497B 468** PIPE EXTENSION  
MAP RECORD

TECHNICAL DEPARTMENT

E 19949

REFERENCES

6/27/36

Installed      feet of 6 inch C.I. Pipe on N/E side of  
E.11th Street ~~between~~ SE/L of ~~and~~ Lisbon  
Connected to 6 inch cl. on NE/S of E 11th St

SIDE CONNECTIONS

Connected      inch main on the      Side of  
Connected      inch main on the      Side of  
Connected      inch main on the      Side of  
Connected      inch main on the      Side of  
Connected      inch main on the      Side of

VALVES AND COCKS SET ON MAINS:

1-6 inch Johns at the NE/S Line of E 11th St  
     inch      at the      Line of       
     inch      at the      Line of       
     inch      at the      Line of       
     inch      at the      Line of     

**T497B 468**

VALVES AND COCKS SET ON SIDE CONNECTIONS:

MAPPED 100' HW Jr.

     inch      at the      of  
     inch      at the      of  
     inch      at the      of  
     inch      at the      of  
     inch      at the      of

Number of Gate Covers and Gate Pots Used 18 Covers  
24.8 Pipe cl.

Depth of trench to top of pipe      inches. Width of trench 46 inches.

Length of trench 8 feet. Main is 4 feet from property line.

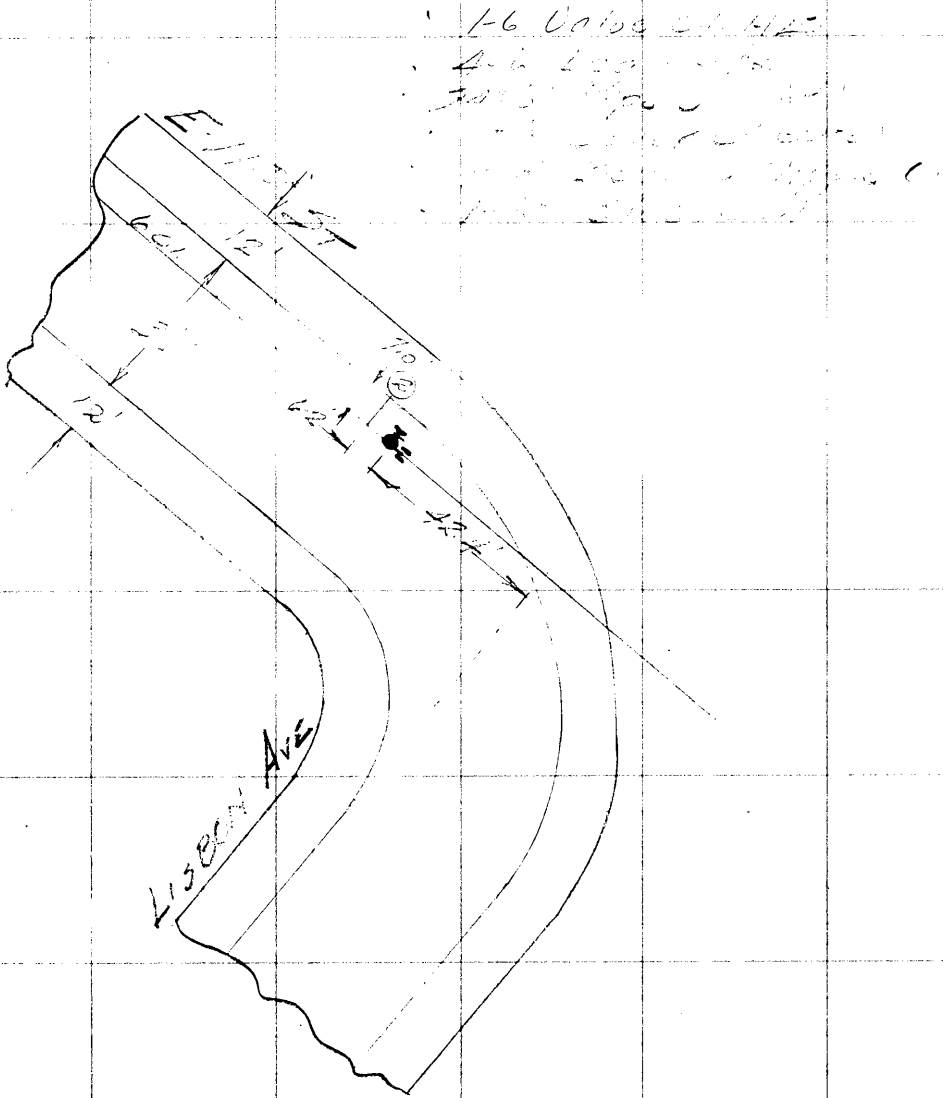
WALL MAP	YARD MAP	TAP MAP	LEAK MAP
<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>

Work Started 7-2-36 Date

Work Completed 7-2-36 Date

Water Turned on      Date



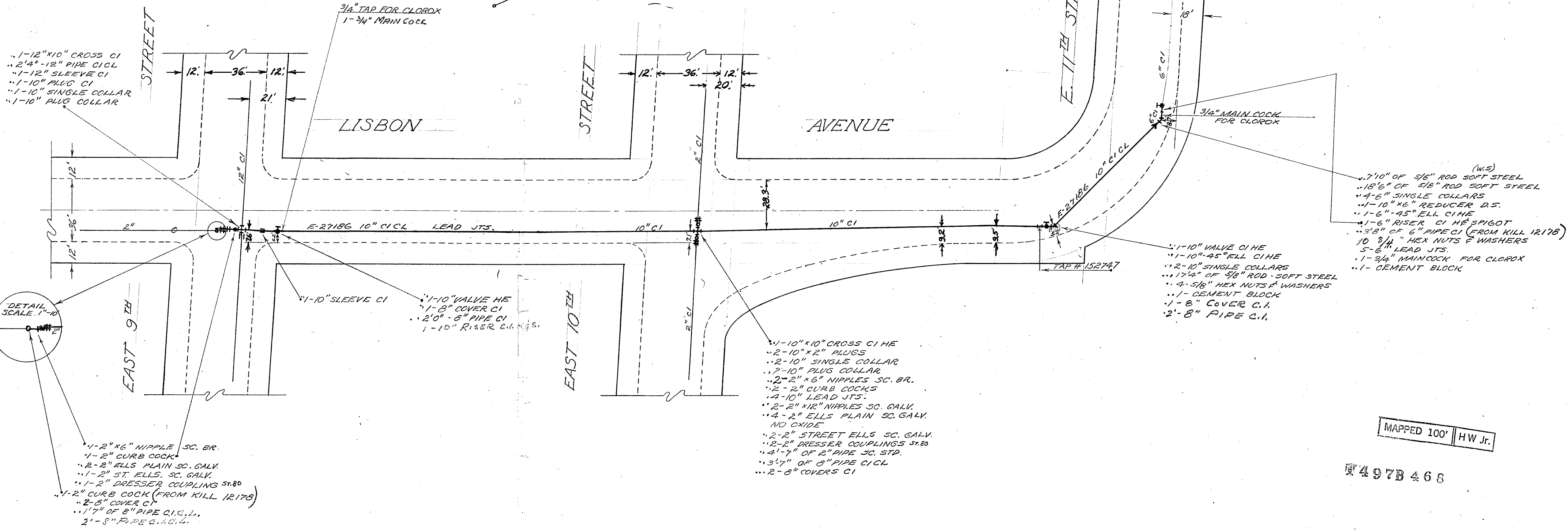
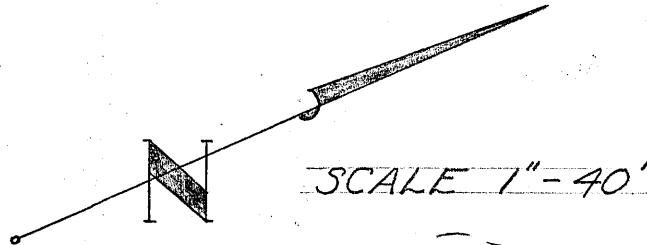


Show new main and fittings installed—RED  
 Show mains and fittings connected—BLACK

Drawing by *[Signature]*  
 Timekeeper



Installed by *[Signature]*  
 Foreman



- 1-12"x10" CROSS CI
- 2'-4"-12" PIPE C.I.
- 1-12" SLEEVE CI
- 1-10" PLUG CI
- 1-10" SINGLE COLLAR
- 1-10" PLUG COLLAR

- 7'-10" OF 5/8" ROD SOFT STEEL (W.S)
- 18'-6" OF 5/8" ROD SOFT STEEL
- 4-6" SINGLE COLLARS
- 1-10" x 6" REDUCER D.S.
- 1-6" 45° ELL CI HE
- 1-6" RISER CI HE SPIGOT
- 3'-8" OF 6" PIPE CI (FROM KILL 12178)
- 10 3/4" HEX NUTS & WASHERS
- 5-6" LEAD JTS.
- 1-3/4" MAIN COCK FOR CLOROX
- 1- CEMENT BLOCK

- 1-10" VALVE CI HE
- 1-10" 45° ELL CI HE
- 2-10" SINGLE COLLARS
- 17'-4" OF 5/8" ROD SOFT STEEL
- 4-5/8" HEX NUTS & WASHERS
- 1- CEMENT BLOCK
- 1-8" COVER C.I.
- 2'-8" PIPE C.I.

- 1-10"x10" CROSS CI HE
- 2-10"x2" PLUGS
- 2-10" SINGLE COLLAR
- 2-10" PLUG COLLAR
- 2-2"x6" NIPPLES SC. BR.
- 2-2" CURB COCKS
- 4-10" LEAD JTS.
- 2-2"x12" NIPPLES SC. GALV.
- 4-2" ELLS PLAIN SC. GALV. NO OXIDE
- 2-2" STREET ELLS SC. GALV.
- 2-2" DRESSER COUPLINGS ST.80
- 4'-7" OF 2" PIPE SC. STD.
- 3'-7" OF 8" PIPE C.I.
- 2-8" COVERS CI

- 1-10" SLEEVE CI
- 1-10" VALVE HE
- 1-8" COVER CI
- 2'-0"-6" PIPE CI
- 1-10" RISER C.I.





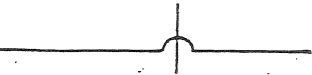
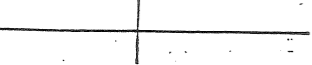

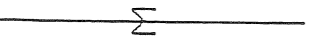
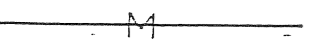
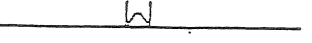

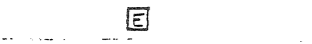

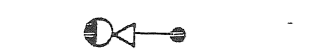


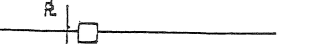
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- 1-2" CURB COCK
- 2-2" ELLS PLAIN SC. GALV.
- 1-2" ST. ELLS. SC. GALV.
- 1-2" DRESSER COUPLING ST.80
- 1-2" CURB COCK (FROM KILL 12178)
- 2-6" COVER CI
- 1'-7" OF 8" PIPE C.I. L.
- 2'-8" PIPE C.I. L.


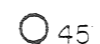
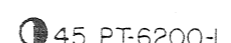



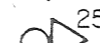


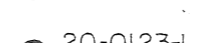
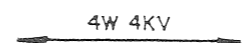
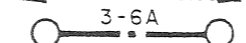
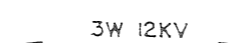
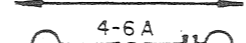
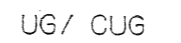
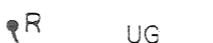
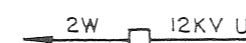
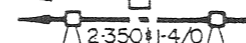







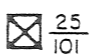
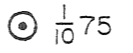
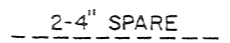
MAPPED 100' HW JR.

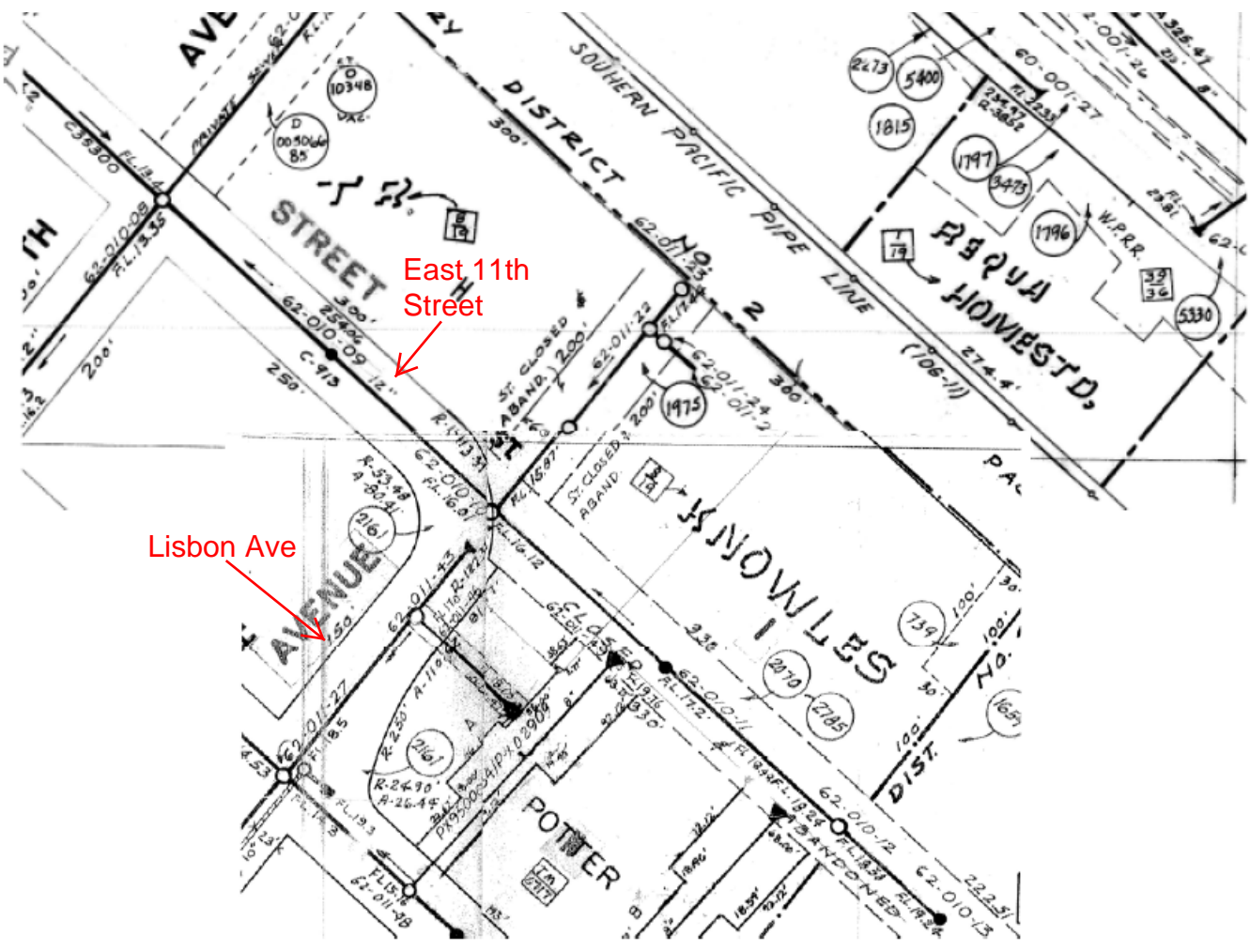
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SYMBOLS FOR P.G.&E. GAS MAPS

UNLESS OTHERWISE NOTED THE SCALE ON A GAS PLAT WILL ALWAYS BE 1" = 100'

	TRANSMISSION GAS LINE (TRANSMISSION PRESS. 61 PSIG AND UP)
	DISTRIBUTION GAS MAIN (HIGH PRESS. 26-60 PSIG)
	DISTRIBUTION GAS MAIN (SEMI-HIGH PRESS. 5-25 PSIG)
	DISTRIBUTION GAS MAIN (LOW PRESS. 10" WATER COLUMN)
	GAS MAINS NOT TIED (USUALLY IN INTERSECTIONS)
	GAS MAINS TIED (USUALLY IN INTERSECTIONS)
	GAS MAIN (DEAD ENDED)
	M2 PRESSURE CONTROL FITTING
	PRESSURE CONTROL FITTING (BOTTOM TAP)
	PRESSURE CONTROL FITTING (SIDE TAP)
	GAS MAIN VALVE
	ELECTROLYSIS TEST STATION (CATHODIC PROTECTION)
	ANODE (CATHODIC PROTECTION)
	RECTIFIER, POLE MOUNTED W/ANODE(S) (CATHODIC PROTECTION)
	DISTRICT REGULATOR STATION
GM1234567-95	GM NUMBER-YEAR INSTALLED
W2W2	WELDED/SIZE/WAPPED/DISTANCE OUT FROM PROPERTY LINE
1 1/4" PL (2) 2	1 1/4" PLASTIC/ INSERTED IN 2" STEEL/ 2' OUT FROM PROPERTY LINE
JT	JOINT TRENCH
1/2" PL 35 95	GAS SERVICE/ 1/2" PLASTIC/ 35' LONG/ INSTALLED IN 1995
	GAS SERVICE WITH CURB VALVE
	GAS SERVICE WITH CURB METER

	P.G.&E. PHONE LINE POLE.
	SOLELY OWNED WOOD POLE WITH LENGTH IN FEET.
	JOINT WOOD POLE WITH LENGTH IN FEET AND - JOINT POLE APPLICATION NUMBER.
	CUSTOMER OWNED POLE.
	POLE WITH RISER TO UNDERGROUND.
	POLE WITH JOINT ANCHOR & JOINT APP. NUMBER.
	POLE WITH OVERHEAD TRANSFORMER, SIZED AS NOTED.
	POLE WITH STREET LIGHT.
	CUSTOMER OWNED STREET LIGHT WITH POLE SIZE.
	POLE WITH CONTACT & AGREEMENT NUMBER.
	4 WIRE 4,000 VOLT OVERHEAD PRIMARY LINE & .....
	3 WIRE no.6 ALUMINUM SECONDARY 1Ø LINE.
	3 WIRE 12,000 VOLT OVERHEAD PRIMARY LINE & .....
	4 WIRE no.6 ALUMINUM SECONDARY 3Ø LINE. open secondary
	UNDERGROUND / CUSTOMER UNDERGROUND.
	UNDERGROUND LINES.
	2 WIRE 12,000 VOLT UNDERGROUND PRIMARY & .....
	350 ALUM. TRIPLEX UNDERGROUND SECONDARY & SERVICES.
	3 Ø BANK OF TRANSFORMERS.
	SUBSURFACE TRANSFORMER.
	PADMOUNTED TRANSFORMER.
	PRIMARY SPLICEBOX / EQUIPMENT ENCLOSURE.
	SECONDARY SPLICEBOX.
	PRIMARY & SECONDARY WIRE SIZE CHANGE.
	LATTICE STEEL POLE, HEIGHT NOTED.
	TRANSMISSION TOWER WITH MILE & TOWER NUMBER.
	TRANSMISSION POLE " " " POLE " HEIGHT NOTED.
	EMPTY DUCT, SIZE & QUANTITY AS NOTED.



East 11th Street

Lisbon Ave