

November 4, 1986

VASTE PROCEAN

Mr. Lowell Miller Hazardous Materials Unit Alameda County Health Care Services 470 - 27th Street, Third Floor Oakland, CA 94612

Re: Bay Center Project, Emeryville, California

Dear Lowell:

Enclosed please find a cover letter addressed to us from Joan Siegal of GSF, regarding the report, "Results of the Gas Emissions Test of the Bay Center Construction Site". Such report was Federal Expressed to you yesterday under separate cover.

If you have any questions, please feel free to contact me.

Walter Kaczmarek

Partner, Bay Center Associates

**Enclosure** 

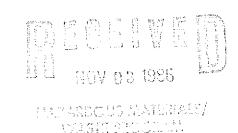
Sincerely,

WTK/pla

# THE MARTIN COMPANY

November 3, 1986

Mr. Lowell Miller Hazardous Materials Unit Alameda County Health Care Services 470 - 27th Street, Third Floor Oakland, CA 94612



Re: Bay Center Project, Emeryville, California

Dear Lowell:

Included for your review are two reports regarding our methane gas study, 1) "Results of the Gas Emissions Test of the Bay Center Construction Site" dated October 9, 1986, performed by GSF Energy Inc. 2) "Results of Monitoring of the Bay Center Site for Calderon Bill Compliance", dated October 9, 1986 performed by GSF Energy Inc. As you may know, GSF is a major consulting firm in the methane gas arena and is located in Long Beach, California. Their expertise in this arena is excellent.

Basically, the reports indicate that methane gas was virtually undetectable above the surface but was detectable below the surface in some areas. They indicate the potential for a methane problem is minimal. However, since some methane was found, GSF has recommended some procedures for us to follow to mitigate any potential risk to our buildings.

We are following their recommendations and are doing the following:

- A) We are ventilating (with ventilation fans) elevator shafts and any other below surface areas in the buildings to prevent build-up. Also, we are putting a methane detector wired to an alarm system in those areas.
- B) We will either mechanically ventilate or line with an impermeable material (liner or coating) all underground utility vaults/boxes. These vaults/boxes will be secured from public access, and access will not be allowed unless first checked by an explosimeter.

Mr. Lowell Miller November 3, 1986 Page two

Lowell, these mitigations are currently being instituted by us in the project. If you have any questions or problems with this, please call me at (415) 463-3773. As you know, time is of the essence.

Sincerely,

Walter T. Kaczmarek

Partner, Bay Center Associates

Enclosures

WTK/pla



October 10, 1986

GSF Energy Inc. 2750 Signal Parkway

P.O. Box 1900 Long Beach, California 90801-1900 Bay Center Associates The Martin Company 4256 Hacienda Drive, Suite #101 Pleasanton, California 94566

Attention: Mr. Walter T. Kaczmarek

Dear Mr. Kaczmarek,

Attached are two copies of "Results of the Gas Emissions Test of the Bay Center Construction Site". As stated in the report, our testing indicated that gas generation at the site is extremely low. The rate of methane production is lower than 0.2 MCFD (thousand feet per day) according to flux box measurements, and should not exceed 7 MCFD based on a calculation made using the results of an analysis of soil hydrocarbons. There are only trace amounts of organic compounds left in the filled portions of the site.

Based on these low gas generation rates, we believe that the buildings would be adequately protected by increasing ventilation in confined spaces such as the elevator shafts and utility boxes. We also recommend that one or more methane detectors be placed in each building during construction after the structure is enclosed to confirm that no methane buildup is occurring.

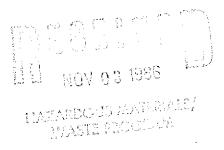
Thank you for giving us the opportunity of assisting you on this project. Please let us know if we can be of further help.

Sincerely,

Joan P. Siegal

Bupervisor, Landfill Evaluation Services

Enclosure



# RESULTS OF THE GAS EMISSIONS TEST OF THE BAY CENTER CONSTRUCTION SITE

GSF ENERGY INC.
October 9, 1986

# TABLE OF CONTENTS

	Page
1.0. Executive Summary	1
2.0. Site Description	3
3.0. Methods	4
3.1. Site Walk 3.2. Probe Installation and Monitoring 3.3. Flux Box Sampling 3.4. Refuse Sampling	
4.0. Results	6
4.1. Site Walk 4.2. Probe Results 4.3. Results of the Flux Test 4.4. Refuse Analysis	
5.0. Conclusions and Recommendations	15

## LIST OF EXHIBITS

		<u>Page</u>
1.	Map of Bay Center Construction Site	
2.	Methane Concentrations in Probes	7
3.	Comparison of NDIR and GC Results	8
4.	Gas Composition in Probes	9
<b>5</b> .	Probe Pressures	11
6.	Methane Concentrations in Flux Boxes	12
7.	Analysis of Refuse Samples	13

# List of Appendices

Appendix 1. Test Borings (Geomatrix Consultants)

Appendix 2. Probe Bore Logs

Appendix 3. GC/MS Results

# Introduced by Assembly Member Campbell

# February 20, 1986

An act relating to levees.

## LEGISLATIVE COUNSEL'S DIGEST

AB 3525, as introduced, Campbell. Levees.

Existing law does not require the Department of Fish and Game to report to the Legislature on steps necessary to restore fisheries and riparian habitat.

This bill would require such a report, as specified, on or

before January 1, 1988.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

- 1 SECTION 1. The Department of Fish and Game shall
- 2 report to the Legislature on or before January 1, 1988, on
- 3 those steps it determines are necessary to restore
- 4 anadromous and resident fisheries in the Sacramento
- 5 River system and to restore riparian habitat along the
- 6 Sacramento River.

#### 1.0. EXECUTIVE SUMMARY

A four day test of the Bay Center Office Construction site was performed by GSF Energy Inc. (GSF) for the Martin Company, Sept. 3 through Sept. 6. The purpose of the test was to determine the quantity of methane gas emitting from the site, as an aid to the selection of proper gas control measures. The test involved four parts:

- Monitoring of 12 probes for methane concentration and pressure. The probes were installed just above the water table (7-20 ft). One probe was sampled for detailed gas analysis by GC/MS.
- Measurement of venting gas collected under flux boxes placed on the landfill surface.
- Analysis of 10 refuse samples for % moisture, cellulose and total hydrocarbon content to determine gas reserves.
- 4. A site walkover with a portable flame ionization detector to determine surface methane concentrations.

Based on results of these tests, the following conclusions were drawn:

- The rate of gas generation on the site is very low, no greater than 7 MCFD, and possibly substantially less. We base this conclusion on four lines of evidence:
  - a. Flux Results. The highest methane concentration achieved in any flux box was 313 ppm in a box placed down the elevator shaft in building pad B. We calculated that for a methane buildup of only 313 ppm in a flux box over 24 h, total gas emitted by the landfill could not exceed 0.2 MCFD.
  - b. Probe Pressures. The mean pressure at 12 probes was only 0.01 in. water.
  - c. Spoils Analysis. Most debris at the site is construction materials brick, wire and rock. Organic debris appeared to be limited to ash, wood and waste oils. Cellulose was undetectable at a sensitivity of 0.2% wet weight. Total gas reserves. based on hydrocarbon content, were estimated at 60 MMCF. Assuming 100% conversion of hydrocarbons into methane in 25 yr, we calculated an upper estimate for gas generation of 6.6 MCFD.

- d. Site Walk. Methane was virtually undetectable (<5 ppm) over the entire landfill surface, except in open pits.
- 2. Despite the low generation rate, low surface permeabilities have caused a build-up of methane gas below the landfill surface. Methane concentrations at eight of 12 probes consistently exceeded 5%, and at five probes methane concentration ranged from 60% to 90%. Thus there is a need to protect non-ventilated areas at the surface from a build-up of methane to explosive concentrations. (Methane is explosive at concentrations between 5 and 15% only in the presence of air.)
- 3. Chlorinated hydrocarbons were below our detection limit of 50 ppm.

# Our recommendations for gas control are as follows:

- 1. Elevator shafts and other areas likely to trap gas must be well ventilated to prevent the buildup of methane at explosive concentrations. Ventilation fans should be installed to aid in gas dissipation. The air intake for the ventilation system should be as far off the ground as possible (or at least 10 feet from the surface).
- 2. Elevator shafts should be equipped with an installed methane detector and alarm system.
- 3. Utility boxes should either be fully ventilated or lined with an impermeable liner or coating. The liner should be elastic enough not to crack even if the side walls or floor of the box crack. The boxes should be secured from public access. No access should be allowed to the boxes unless they are first checked for methane concentrations by an explosimeter.

#### 2.0 SITE DESCRIPTION

The Bay Center Project is located in the City of Emeryville west of Bay Street, east of Lacoste Street and Highway 80, north of 64th Street and south of 65th Street (Exhibit 1). The site encompasses 16.5 acres. Three low rise office buildings and adjacent parking areas are currently under construction. Prior to its development as an office center, the site was used as a truck terminal by Garrett Freight lines.

The area was reclaimed from the San Francisco tidal plain after the construction of the East Shore highway in 1954. The site was filled by the City of Emeryville in the late 1950's. Fill materials were reported to be clean fill and non-municipal wastes (heavy metals and petroleum products were found). The site is basically flat, although it slopes gently to the north.

In 1985 a geotechnical study was performed by Geomatrix Consultants to provide engineering data prior to site development. As part of this study, 14 test borings were made (see Appendix 1). The study found that the upper 1.5 to 2.5 feet of soil was generally pavement materials and imported fill. A dark colored heterogeneous fill of sand, clay and construction debris was encountered below the pavement and imported fill materials and extended to a depth of 6 to 10 feet below grade. A layer of soft silty clay or loose sand was encountered below the heterogeneous fill and extended to a firm soil at a depth of 15 to 20 feet below grade. These are presumably natural deposits. No evidence of standard municipal refuse or paper products was found.

#### 3.0. METHODS

#### 3.1. Site Walk

A walkover survey was conducted on the morning of September 4, 1986, using a Heath DETECTO-PAK II flame ionization detector (FID) to determine ambient concentrations of total hydrocarbons as methane. Starting in the northwest corner of the site, we measured methane concentrations at approximately 50 ft intervals over most of the landfill surface, and more frequently within the trenches on building pads A and B.

## 3.2. Probe Installation and Monitoring

Thirteen probes were installed on Sept. 3 at the locations marked in Exhibit 1. Probe holes (10 in) were drilled to the depth of the water table, 7-20 ft. Probes were constructed of PVC pipe (20 ft) with 3 ft of slotting to allow gas migration. Following probe installation, bore holes were backfilled with 3/8 in. pea gravel, soil and bentonite, and probes were pressure capped. Caps were removed on Sept. 6 and temperature at the bottom of each probe bore was measured using an Omega 5800 with thermistor probe and 100 ft lead wire.

Methane concentrations in probes were measured twice daily on Sept. 4 and 5 using a non-destructive infrared detector (NDIR) retrofitted with a hand pump for sample delivery. Two NDIR's, models MEXA-221E and MEXA-321E, were used for this test. The 221E, a low-range instrument, was calibrated with 0.4% methane gas and used to measure concentrations <2.5%. The 321E, a high-range instrument, was calibrated with 3% methane standard and used to measure concentrations between 2.5% and 50%. Both instruments were calibrated at the beginning and end of each sampling period. Endpoint calibrations were always within 5% of initial settings.

Probe pressures were measured using a water magnahelix (Dwyer 2001) with range 0-1 in. water and sensitivity 0.01 in.

Duplicate samples of gas (500 cc) were obtained in stainless steel cylinders from all probes on Sept. 5 using a sample pump powered by the truck battery. Samples were returned to the laboratory for five gas (H2, CO2, O2, N2 and CH4) analysis using a Carle 8700 GC with a Series Porpack Q, molsieve SA column and TCD Detector. In addition, samples taken at the six probes located in building pads A, B and C were analyzed for chlorinated hydrocarbons using a Varian 4600 gas chromatograph and Hall electrolytic conductivity detector. A single sample

cylinder from probe I in building pad B was sent to West Coast Analytical Services for detailed GC/MS analysis of priority pollutants at a detection limit of 100 ppb.

#### 3.3. Flux Box Sampling

Five flux boxes (1-5) were placed on Sept. 4 near probes A, D. I, K, and L (Exhibit 1). Methane in boxes was measured by FID at 5-10 min intervals for 2 hours. Flux boxes were then left overnight and sampled again after 24 hours. Glass bulb samples were taken at three of the five boxes for measurement of ppm methane by GC.

Flux boxes were moved on Sept. 5 to the locations marked 6-10 on Exhibit 1. One box in each of pads A, B, and C was placed in a trench, while the 4th box was placed in an elevator shaft on pad B and the 5th on a slope back of pad C. Methane (ppm) in boxes was measured by FID at the time of initial placement and after approximately 24 hrs. Glass bulb samples were obtained from two of the boxes for measurement of ppm methane by GC. For comparison, we also sampled the ambient air for methane concentration.

#### 3.4. Refuse Sampling

Refuse samples were taken at 10 probe locations at the time of drilling. Depth of the refuse layer was determined visually. Five replicate samples of spoils were collected in quart-size Ziploc bags and pH was determined using indicator paper. Refuse samples were labeled, double-bagged and shipped to the GSF laboratory for determination of moisture and organic content.

Percent moisture was determined as the difference in weight of a sample following drying for 48 hrs at 100C. Grindable materials were manually separated from nongrindables, then weighed and ground with a Wiley mill through a 2 mm sieve. The ground sample was mixed thoroughly and reground through a 0.5 mm sieve, dried and reweighed.

For determination of volatile organics, a dried and milled sample was ignited in a muffle furnace at 540C for two hr., then reweighed. For determination of cellulose, a dried and milled sample was hydrolyzed overnight in 66% sulfuric acid, then treated with a phenol-sulfuric acid mixture to form a colored complex. Absorption by the complex was measured spectrophotometrically at 485 nm and % cellulose calculated using a standard curve.

A single 100 g subsample from each probe bore was sent to Core Laboratories for determination of total hydrocarbons (% wet weight) by EPA Method 3540. Briefly, this analysis involved a Soxhlet extraction with Freon 113 for four hours, after which weight of the hydrocarbon residue was determined.

#### 4.0. RESULTS

#### 4.1. Site Walk

The site walk was begun at 9:05 on the morning of Sept. 4, and ended at 10:00 a.m. Wind speeds ranged between 4 and 5 mph during the site walk. No methane above ambient was detected over the landfill surface. We measured 15 ppm methane in a ditch near pad B, and another 7 ppm in the sewer trench behind pad B.

#### 4.2. Probe Results

Probe locations are shown in Exhibit 1; probe logs completed during drilling are contained in Appendix 2. In general, the probe profile indicated 3-6 ft of clean fill underlaid by 2-8 ft of debris. Water was encountered at 7-20 ft below grade. Temperature at the bottom of probes ranged from 68-78 degrees Pahrenheit.

Methane concentrations in probes ranged from a trace (0.08% at probe D, Exhibit 2) to >50% (probes A, C, E, G and H), the upper limit of detection for our instruments. Methane concentrations measured by NDIR in the field were in good agreement with those measured by GC in the lab (Exhibit 3); the mean difference between analytical methods was  $0.84 \pm \text{S.D.} \ 0.66\%$ . Methane concentrations appeared to be greatest where the site was least developed; i.e. in pad C and in the eastern half of the site. Conversely, concentrations were very low in pad A and intermediate in pad B. Thus the trenching associated with construction may, at least in the short term, deplete methane trapped at the site.

Results of five gas analysis on probe samples are given in Exhibit 4. Gas composition was highly variable among probes, ranging from nearly aerobic (Probe D) to almost 90% methane (probe H); however, at none of the probes did gas composition approach that of standard landfill gas, which typically comprises 55% methane, 43% CO2. The low (0-6%) CO2 concentrations found here suggest that a carbon source more reduced than cellulose, possibly waste oil, is the primary substrate for methanogenesis at this site.

No chlorinated hydrocarbons were detected in any probe samples at a detection limit of 50 ppm. Probe pressures

EXHIBIT 2. Methane concentrations in probes (NDIR results). NA: not applicable.

Probe	4Sep86 1130	4Sep86 1700	5Sep86 1000	5Sep86 1900	Mean	SD
Α	>50.00	>50.00	>50.00	>50.00	NA	NA
В	28.00	32.00	40.00	33.00	33.25	4.99
С	40.00	41.00	>50.00	>50.00	NA	NA
D	0.00	0.09	0.20	0,04	0.08	0.09
E	35.00	>50.00	>50.00	>50.00	NA	NA
F	15.00	26.00	38.00	29.00	27.00	9.49
G	>50.00	>50.00	>50.00	>50.00	NA	NA
Н	40.00	>50.00	>50.00	>50.00	NA	NA
I	2.00	3.80	6.00	4.40	4.05	1.65
J	0.70	0.15	2.70	0.35	0.98	1.17
К	0.70	1.80	6.00	3.20	2.93	2.29
L	12.00	24.00	41.00	35.00	28.00	12.78

EXHIBIT 3. Methane concentrations in probes. Comparison of NDIR and GC results. NA: not applicable.

Probe	% Methane (NDIR)	% Methane (GC)	Difference
A	50.0+	74.05 (74.2/73.9)	NA
В	33.0	33.2 (33.8/32.6)	0.2
С	50.0+	64.2 (65.9/63.4)	NA
D	0.04	0.5 (0.5/0.5)	0.46
Е	50.0+	61.3 (61.3/61.3)	N A
F	29.0	30.9 (32.3/29.5)	1.9
G	50.0+	79.35 (79.9/78.8)	NA
Н	50.0+	88.8 (89.5/88.1)	NA
I	4.4	5.55 (6.0/5.1)	1.15
J	0.35	0.45 (0.4/0.5)	0.1
ĸ	3.2	4.6 (4.1/5.1)	1.4
L	35.0	34.3 (34.3/34.3)	0.7
Mean	NA	39.8 <u>+</u> SD 32.8	0.84 <u>+</u> SD 0.66

EXHIBIT 4. Gas composition in probes sampled Sept. 5, 1986. Data represent the mean of duplicate samples. HC-X: chlorinated hydrocarbons (method sensitivity - 50 ppm). ND: not detected; NS: no sample; NA: not applicable.

V/V %

Probe	H2	CO2	02	N2	CH4	HC-X
Α	<0.1	2.4	0.4	23.1	74.1	ND
В	<0.1	3.0	3.1	60.6	33.2	ND
С	<0.1	5.5	0.5	29.3	64.7	NS
D	<0.1	1.3	16.8	81.4	0.5	NS
E	<0.1	2.7	0.5	35.5	61.3	NS
F	<0.1	1.7	0.9	66.6	30.8	NS
G	<0.1	3.9	0.7	16.0	79.4	NS
Н	<0.1	5 . <b>7</b>	0.1	5.3	88.8	NS
I	<0.1	0.3	1.4	92.8	5.5	ND
J	<0.1	2.2	1.4	95.9	0.5	ND
K	<0.1	0.1	2.0	93.3	4.6	ND
L	<0.1	0.1	0.9	64.6	34.3	ND
Mean (SD)	<0.1	2.4 (1.9)	2.6 (4.6)	55.4 (32.4)	39.8 (32.8)	NA

were uniformly low, averaging only 0.01 in. water (Exhibit 5). This finding, together with results from the flux test presented below, suggests that the rate of gas generation is extremely low. Nevertheless, a reservoir of methane has slowly accumulated at the site, due to entrapment of the gas by a relatively impervious soil cover. While this gas poses no danger in the anoxic interior of the landfill, care must be taken so that gas venting through to the surface does not accumulate to the explosive limit for methane (5-15%) in air.

GC/MS analysis for trace components in a sample from Probe I indicated that vinyl chloride was present at 120 ppb. None of the other compounds listed in Appendix 3 were detected at a detection limit of 100 ppb.

#### 4.3. Results of the flux test

Methane concentrations above background were undetectable with the FID in any of the flux boxes after 24 h. Glass bulb samples were analyzed in the lab for ppm methane; results are shown in Exhibit 6. The concentration of methane in boxes placed on the surface of building pads A and B was no greater than ambient (65 ppm), while concentrations in a box on pad C and a trench on pad A slightly exceeded ambient (136 ppm and 184 ppm, respectively). The highest concentration, 313 ppm, was detected after 24 h in a box placed down the elevator shaft on building pad B. This rate of gas accumulation (313 ppm/d) leads to an upper estimate for gas generation of 0.16 MCFD, based on the following calculation:

G = ppm CH4/day X (BV/AUB) X ALF; where

G = gas generation (MCFD) BV = box volume = 3.68 CF AUB = area under the box = 770 sq in or 1.22 X 10E-4 acres ALF = area of the landfill = 16.5 acres

Even if the 313 ppm concentration were built up over a much shorter time period, e.g. one hour, the rate of gas generation would still be low, at 3.8 MCFD.

#### 4.4. Refuse Analysis

Results of the analysis of refuse samples are given in Exhibit 7. Mean sample depth was 8 ft, and pH was close to neutral, at 7.5. Refuse samples were dry, with a mean moisture content of 14.6%, indicating a very slow decay rate of organic materials.

EXHIBIT 5. Probe pressures (inches water). NS: not sampled.

Probe	4Sep86 1130	4Sep86 1700	5Sep86 1000	5Sep86 1900	Mean	SD
Α	0.02	0.00	0.00	NS	0.01	0.01
В	0.02	0.00	0.00	NS	0.01	0.01
С	0.02	0.00	0.00	NS	0.01	0.01
D	0.00	0.00	0.00	NS	0.00	0.00
E	0.02	0.02	0.01	0.02	0.02	0.01
F	0.00	0.03	0.00	NS	0.01	0.02
G	0.02	0.00	0.00	NS	0.01	0.01
Н	0.04	0.10	0.02	NS	0.05	0.04
I	0.02	0.00	0.00	NS	0.01	0.01
J	0.00	0.01	0.00	NS	0.00	0.01
K	0.02	0.00	0.00	NS	0.01	0.01
L	0.00	0.00	0.01	NS	0.00	0.01
Mean	0.01	0.02	0.00	NA	0.01	0.01

EXHIBIT 6. Methane concentration (measured by GC) in flux boxes after 24 hours. Ambient methane concentration in air sampled on Sept. 6 was 64.4 ppm.

Sample	Location	_Date	Methane (ppm)
FB-1	Near probe A, on Pad C	9-5-86	136.0 (137.9/134.1)
F B – 4	Near probe I, on Pad B	9-5-86	73.7
FB-5	Near probe K, on Pad A	9-5-86	68.6
FB-8	Down elevator shaft on Pad B	9-6-86	313.7
FB-9	Down trench, SE corner of Pad A	9-6-86	183.6
Mean		-	155.1 <u>+</u> SD 100.5

EXHIBIT 7. Physical and chemical properties of refuse samples.

Data represent the mean (and SD) for five replicate samples.

Station	Sample Depth (feet)	рH	Moisture (% wet wt)	Volatiles (% wet wt)	Cellulose (% wet wt)	Hydrocarbons (% wet wt)
В	10	7.2	14.38 (1.61)	1.24 (1.25/1.23)	<0.2	0.134 (0.126/0.142)
<b>C</b>	8	ND	10.01 (1.18)	0.89 (0.91/0.86)	<0.2	0.614
D	5	ND	11.18 (2.96)	1.27	<0.2	0.561
E	8	7.6	16.88 (0.53)	1.45 (1.42/1.48)	<0.2	0.614
F	6.5	7.6	14.48 (1.17)	1.50	<0.2	0.368
I	9	7.6	16.02 (2.31)	1.20	<0.2	1.02
J	7	7.5	14.35 (2.57)	1.12	<0.2	0.402
К	8	7.6	18.73 (1.13)	1.05 (1.07/1.03)	<0.2	0.406 (0.534/0.278)
L	8	7.6	17.06 (2.54)	1.83	<0.2	0.089
М	8.5	7.6	14.10 (1.48)	2.30 (2.34/2.36)	<0.2	1.81
Mean	7.8	7.5	14.60 (2.85)	1.38 (0.41)	<0.2	0.602 (0.500)

The concentration of volatiles was very low at 1.4% wet weight, while cellulose was undetectable at a sensitivity of 1% grindables (<0.2% wet weight). By contrast, the cellulose content in fresh refuse is typically near 40%.

Because cellulose appeared to be unlikely as the substrate for methanogenesis, we hypothesized that hydrocarbon degradation might provide the source for methane production. Total hydrocarbons measured by Core Laboratories ranged from 0.09% to 1.8% of wet weight; the mean hydrocarbon content was 0.6%. This mean was used to estimate methane gas reserves of 60 MMCF, based on hydrocarbon decomposition as follows:

R = (FHC X DDS X TRL X ALF)/DMG; where

R = gas reserves (MCF)

FHC = fraction hydrocarbon (dry wt.) = 0.007 lb/lb soil)

DDS = density dry soil (From Geomatrix report = 100 1b/CF)

TRL = thickness of refuse layer = 5 ft

ALF = area of landfill = 16.5 acres = 718,740 sq ft

DMG = density methane gas = 42.28 lb/MCF

Assuming 100% decomposition of hydrocarbon reserves into methane gas over a period of 25 years, we arrive at a gas generation rate of 6.6 MCFD, almost 50 times the estimate derived from flux test data. However, we believe the new estimate to exaggerated because:

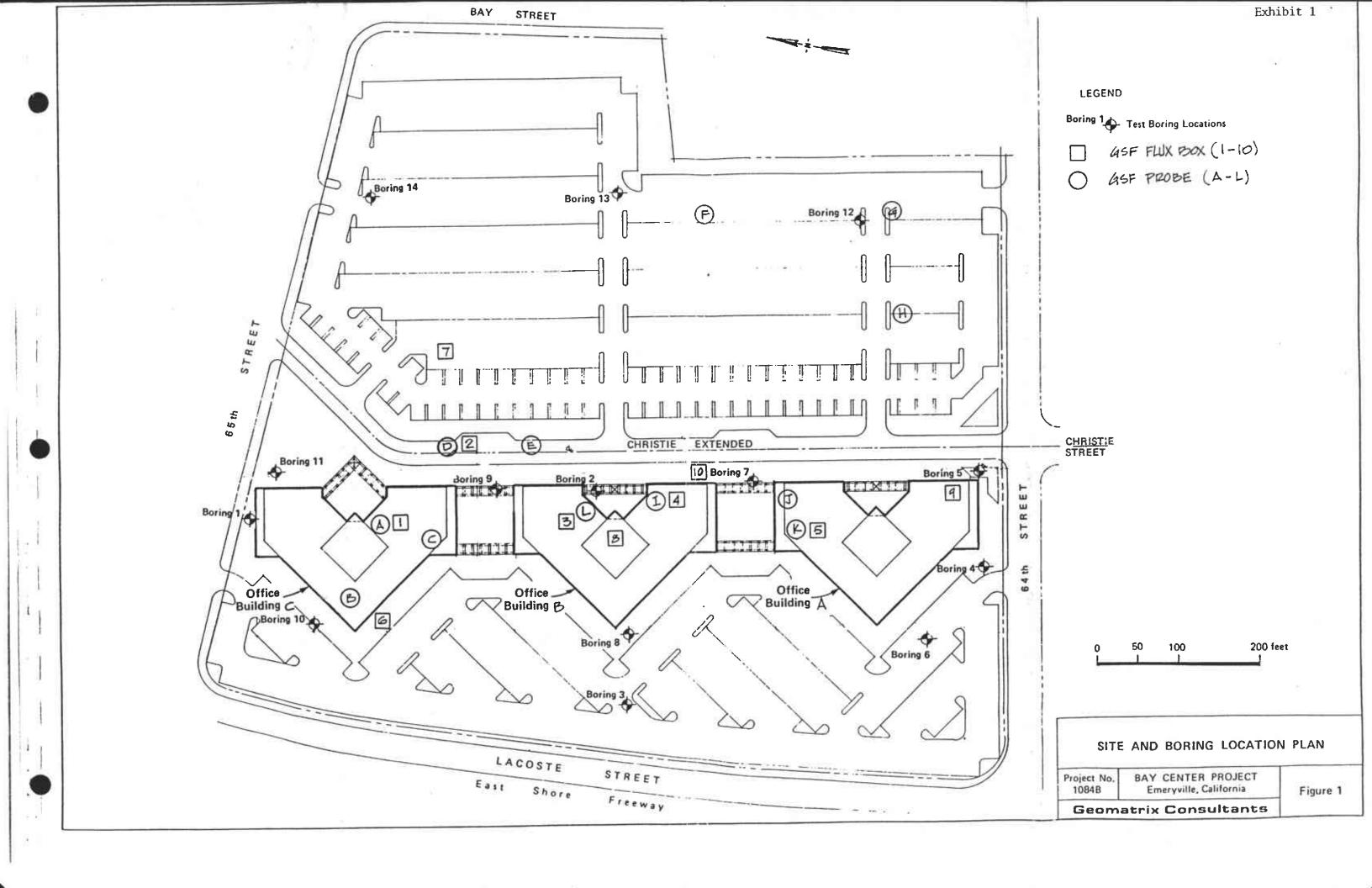
- 1. In the scientific literature, the anaerobic degradation of hydrocarbons is reported as nonexistent to exceedingly slow.
- 2. In any case, only certain components of petroleum hydrocarbons are biodegradable.

It is thus very unlikely that 100% of hydrocarbons would degrade to methane gas in 25 years. We have presented this calculation only as an upper limit to total gas reserves.

## 5.0. CONCLUSIONS AND RECOMMENDATIONS

All available evidence leads to the conclusion that the rate of gas generation at this site is extremely low. This is consistent with the non-municipal content of the waste and the age of the refuse. However, there is methane gas on site, which has probably built up over a number of years by the slow anaerobic degradation of waste oils. The pattern of methane concentrations in probes suggests that, at least in the short term, this gas may be depleted by the trenching activities associated with construction. Nevertheless, certain precautions should be taken to ensure proper ventilation of site structures. In particular, we recommend:

- 1. Elevator shafts and other areas likely to trap gas must be well ventilated to prevent the buildup of methane at explosive concentrations. Ventilation fans should be installed to aid in gas dissipation. The air intake for the ventilation system should be as far off the ground as possible (or at least 10 feet from the surface).
- 2. Elevator shafts should be equipped with an installed methane detector and alarm system.
- 3. Utility boxes should either be fully ventilated or lined with an impermeable liner or coating. The liner should be elastic enough not to crack even if the side walls or floor of the box crack. The boxes should be secured from public access. No access should be allowed to the boxes unless they are first checked for methane concentrations by an explosimeter.



Project:	BAY CENTER PROJECT Emeryville, California	BORING I	LOG LEG	END SHEE
Type of Boring:				
Samples Blows/Ft	DESCR			Moisture Content, % Dry Density, bcf Unconfined Auctompressive
5-	2-Inch I.D. Modified 3-Inch diameter She			
29 -	Falling 30 inches  Blow Count with a 28	30-1b. Downhole, alling 30 inches		
25—	ed    Sampler Pushed by Hy   ▼ Water Level Measured:  ATD    At Time of Drilli  3 Hrs.    In Hours or Days  9/19/85    On Date Indicated	ng After Drilling		
30 Project No. 1084B	Geomatri:			Figure A-1

Project:	BAY CENTER PROJECT		D			<u> </u>
	Emeryville, California	Log of	Boring	No	. 1	
Date Drilled:	4/23/85	Remarks:		<u> </u>	<del></del>	<del></del>
Type of Boring:	410					
Hammer Weight:_	140 lbs.	. (See Legend Sheet	for sampler by	pes and	hamme	r weights
				LAB	ORATO	RY TESTS
Samples Blows, Ft	MATERIAL	DESCRIPTION		5%	s i y	sive
B S				Moisture Content,%	Density, pcf	pres
	Surface Elevation: 11±			چۆ ق¥	Dry	Unconfined Compressive Strength,
<b> </b>	10" Asphalt Surfacing a	nd Aggregate Basi	e Material			
1 12 60	GRAVELLY CLAY FILL					
	Stiff, moist, yellow-	brown	/ i	1		
$\begin{array}{c c} 2 & \frac{5}{6} \end{array}$	Soft to medium stiff,	brown to black.		4	L	
	with misc. debris	•		4		
5 3 3 3	▼_			-		
3 3 6" A				<b> </b>		
-	SILTY CLAY (CH)			4		
	Soft, grey			1		
10-	•			7		
4 3 3	←—Petroleum oder			7		
				1		
				7		
	SANDY CLAY (CL)			1		
1 11	Stiff, grey-green			-		
5 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				-		
1 1 6"	SANDY CLAY (CL)			-  <sup></sup>		
4	(			4 1		
4	Very stiff, brown			1		
4 11 1			Ï	]		
20					j	
			[	7 /	]	
				1	. ]	
	SILTY SAND (SM)			1		
]	Dense to very dense, b	rown	ĺ	1 1		
_	•			-		
6 50 41			-	┥╌╴┞	.	
1 11 1	•			- I	İ	
-				4		
-				<b>.</b>		
	<u> </u>	· · · · · · · · · · · · · · · · · · ·		]	-	
30-	SILTY CLAY (CH)		_	]		
4	Stiff, blue-grey			]	1	
Project No. 1084B	Geomatri	Consultants	<u> </u>	Ein	ure A-	2

MATERIAL DESCRIPTION  SILTY CLAY (CH) Stiff, blue-grey  SILTY SAND (SM) Medium dense, blue-grey
SILTY CLAY (CH) Stiff, blue-grey  7 13 6" SILTY SAND (SM)
Bottom of Boring at 36'
45— ———————————————————————————————————
55-
60-
65—Project No. 1084B Geomatrix Consultants Figure A-3

Pro	jес	t:		Y CENTER PROJECT Emeryville, California	Log	of	Boring		No.	2	<u> </u>
Date	Drit	led:_		4/23/85		<del></del>					
		oring:		8" Hollow Stem Auger	Remarks:	<del></del>					
		Veight		140 lbs.	(See Legen)	t Sheet	for sampler fy				
-		T.	Ţ		tode Legeni	3 3/166/	to: sumpler Ey	hez			RY TESTS
Depth, FI	Samples	Blows/Ft.		MATERIAL 1	DESCRIPT	ION			Moisture Content,%	Ory Density, pcf	Unconfined Compressive Strength,
		T	T	10" Asphalt Surfacing ar	d Aggragat	- P	Mas:-1 T	$\dashv$	S		22
- - - 5	2	27 6'' 38 6'' 26 6''		CLAYEY SAND FILL  Medium dense, black, wood, metal, glass, co	with misc. opper wire	debri	s (burnt	1-1-1-1			
10	4	15 6"		CLAYEY SAND (SC) Loose, blue-grey  SILTY CLAY (CH) Soft, black and green  Bottom of Boria	<u>.                                    </u>	etrole	eum oder	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
20-			16 16 16 16 16 16				-				
25-							- -				
Project	No.	1084B		Geomatrix	Consult			7	Figu	re A-	

Project:	BAY CENTER PROJECT Emeryville, California	Log of Boring		No.	3	<del></del>
Date Drilled:_	4/23/85	Remarks:				
Type of Boring	: 8" Hollow Stem Auger					
Hammer Weight	t:140 lbs.	(See Legend Sheet for sampler )	ypes			
						RY TESTS
Samples Blows/Ft	MATERIAL	DESCRIPTION		Moisture Content,%	/ Density, pcf	Unconfined Compressive Strength,
	Surface Elevation: 12±		$\Box$	≥ີ ເ	Ory	5 g w
	14" Asphalt Surfacing	and Aggregate Base Material				
1 7 16	Medium dense, moist,	, black, with glass,				
$\frac{1}{2}$ $\frac{3}{6}$	metal and pyrite lik	ke crystals	17			
	3AND FIEL		1			
$5 - 3 + \frac{2}{6}$	Loose, wet, grey  ▼ SANDY CLAY FILL	· · · · · · · · · · · · · · · · · · ·	П			
- H F	ATD Stiff, moist, brown		1 1			1
-	SILTY SAND FILL		H			
4 11	Loose, black		┨	j	'	
4 11	SILTY CLAY (CH)		╽┧	i		
10-4	Soft, blue-grey, wit	th some sand layers	┰			
$10-4$ $\frac{3}{6''}$			] ]			
7 1	1					
1	Bottom of Bor	ing at 111	]			
	-80000000000000000000000000000000000000	ing at 11	1			į
15-			H			
4			-			
4 11						
] []						
20-						
7 []			11			
- 11			1	ı		
-						
4 11						
25-			$ \dashv$			
4						
1				ļ		
] []			$  \downarrow  $			
		-	$\lfloor \rfloor$			
_			$  \  $			
30-			П			
			ᅜ			
Project No. 1084	IB Geomat	rix Consultants	1	Fig	jure A	-5

Pro	jec	t:	В	AY CENTER PROJECT Emeryville, California	Loa	of	Boring		No	4	
	2-:1			· · · · · · · · · · · · · · · · · · ·	_ <del></del>					• •	
		lled:_ loring		4/23/85 8" Hollow Stem Auger	Remarks:	<del>,</del>			<del>-</del>		
				140 lbs.	(See Legend	Sheet	for sampler <b>f</b>	voe:	e and	hamme	wainhte)
ī.	T		<u> </u>					) P = .			RY TESTS
Depth,	Samples	Blows	<u>L.</u>	MATERIAL I	DESCRIPTI	ON	-·· <u> </u>		Moisture Content, %	Density, pcf	
-	T 1	7	<u> </u>	Surface Elevation: 13±-	* *			1	25	o,	>౭~
-				12" Asphalt Surfacing ar GRAVELLY CLAY FILL Stiff, moist, yellow-b		e Base		      -			
	1	22 6'		MIXED CLAY AND SAND FILL Black, with misc. debr				-			
5-	2	7 중		≪ Seepage				- 1			
			<b>▽</b>		nic materia	ə l		-			
10-	3	1 6"		<b>←</b> Petroleum oder							
- 15-	4	2 6"						1			,
				SILTY SAND (SM-SP) Loose, gray, with some	clay layer	'S		1 1 1			-
20-				•				1			
				SILTY CLAY (CL)				-			
				Very stiff, brown				+			
25-	5	12 6"						1			
				SILTY SAND (SM-SP)				1			
			ļ	Medium dense to dense,	brown		1	٦	1		
							1	7			
30-			İ					7			
								7			
Project	- No	10945	<u> </u>	Geometrix				7		150 A-4	

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	(Co	ntinued)
Depth, Ft. Samples Blows/Ft.	MATERIAL D	ESCRIPTIC	N	ţ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
40- 45- 50- 60-	SILTY SAND (SM-SP) Medium dense to dense,  Bottom of Bori	brown	ON .		Hoist Conten	Dry Der	Unconf
65— Project No. 1084B	Geomatrix C			-		ure A-	

Pro	ject	:	BAY CENTER PROJECT	Log	o f	Posina		NI.		<del></del>
			Emeryville, California	Lug	01	Boring		IVO.	)	
			9/18/85 4" Rotary	Remarks:						
			280 lbs.	/=		<del></del>			<del></del> -	
-		1		(See Legend	Sheet	for sampler p	ype			
Depth, Ft.	Samples	Blows, Ft.	MATERIAL [	ESCRIPTI	ION			Moisture Content,%	Density, pcf	Unconfined Compressive Strength,
			Surface Elevation: 14±					Σိ၀	ç	580
-    -			3" Asphalt Surfacing CLAYEY SAND FILL Dense, brown, with ro	ck fragmen	ts		-			
5			CLAYEY SAND FILL Loose, dark brown, wi (glass, wood, steel)	th misc. d	ebris		1			
-			SILTY CLAY FILL				1			
10			Soft to medium stiff, with misc. debris	dark grey,						
, - - - - -	'	6*	Wood, brick, slag (oi	1y)				28	94	
15-	2	4*						No Re	cove	⊧гу
20-	3 5	52*	GRAVELLY SAND (SW)  Dense, orange-brown					21 1	02	
25— —	14	4*	SANDY CLAY (CL) Very stiff, orange-brow	VΠ			4	No Re		гу
			SILTY SAND (SP-SM)  Dense, orange-brown				-	19   1	12	
30-		6			<u> </u>				-	
TOJECI	t No. 10	JU4B	Geomatrix	Consulta	ents		J	Figu	re A-l	e l

Project:	;	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. 5	<u> </u>
Depth, Ft. Samples	Blows/Ff.	MATERIAL DE	SCRIPTI	ON	Ė	Moisture Content, %	Dry Density,	Unconfined Compressive Strength, penuituo
		SILTY SAND (SP-SM) Dense, orange-brown	-			-		
35-7	19*	SILTY CLAY (CL) Stiff, grey, with som	e sand		-	No	Recov	ery
8 40	30*	SILTY SAND (SM-SP)				19	111	1920
1 1 1	63	Very dense, dark grey			-  -  -			
45 10 3	36*	SILTY CLAY (CL) Very stiff, dark gray		<u> </u>	-	22	104	6150
50-		Becoming sandy clay			-   -   -			
11 15	9*	Becoming grey silty cla	У		-	20	108	6630
55-								
60-12 24	*	Becoming dark grey and stiff				40	80	2600
65—								
Project No. 108	34B	Geomatrix Cor	nsuitani	ts.		Figu	re A-9	,

Pr	ojec	t :	BAY CENTER PROJECT	<u> </u>					
		<b>-</b>	Emeryville, California	Log	of	Boring	No	. <b>5</b>	ontinued)
Depth, Ft.	Samples	Blows/Ft.	MATERIAL DE	ESCRIPTI	ON	ļ	Moisture Content, %		Unconfined Compressive Strength, psf
70-	1 1 1		SILTY CLAY (CL) Stiff, dark grey  SANDY CLAY (CL)						
75-	- 13	67*	Very stiff, orange-brow some gravel	n, with		  -	24	100	3790
80- - - 85-	14	57*	GRAVELLY SAND (SW) Very dense, orange-brown SANDY CLAY (CL) Very stiff, orange-brown				22	105	2580
90-	15	60*	SILTY CLAY (CL)  Very stiff, orange-brown with grey with some grave	mottled el			22	104	5570
95—	16	70÷	Becoming sandy clay (Ci						
Proje		1084B	Geomatrix Co	nsulta	nt=		22   Fia	104 ure A-	1860
<u>_</u>							ı ıy	219 X	10

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	 ]	No	. E	 }
Date Drilled:	9/19/85	Remarks:						
Type of Boring:		iiciidiks,			-			
Hammer Weight:	280 lbs.	(See Legend	Sheet	for sampler	Èvoi	s and	hamm	AC waights
E 2					7,7			ORY TESTS
Samples Blows/Ft	MATERIAL (	DESCRIPTI	ON			Moisture Content.%	Density,	
	Surface Elevation: 15±					¥Ş	Dry	S C C
-	SILTY CLAY FILL			-				
-	Stiff, grey-brown, wit misc. debris (metal, w	h gravel a ire, etc.)	nd					
5-	Becoming soft and da (debris includes brights, and metal)	rk grey cks,			-			
					-			
10-					  -			
- 1 7*					-			
4					1			
2 2*	SILTY CLAY (FILL ?) Soft, light grey, with streaking	dark grey			1 1 1 1	67	59	330
3 16*	CLAYEY SAND (SC) Medium dense, grey, wit	h shells				<b></b>		
	SILTY CLAY (CL)				4			
25 4 59*	Stiff, orange-brown, wi	th sand			<del> </del>			
	CLAYEY SAND (SC) Dense, grey-brown				1			
50 - 5 29*					-			
roject No. 1084B	Geomatrix (	Consulta	nts		7		111 ure A-	11

\	roje	ect		BAY CENTER PROJECT Emeryville, California	Log	of	Boring	١	lo.	<b>6</b>	ontinued)
	Uepin, Ft.	Samples	Blows/Ft.	MATERIAL DI	ESCRIPTIO	ON	ţ	Moieture	Content, %	Dry Density, pcf	Unconfined Compressive Strength,
3:	5-	6 💆	70 6"*	CLAYEY SAND (SC) Dense, grey-brown				-	-		
4(		7	93*	SILTY CLAY (CL) Stiff, grey  SILTY SAND (SP-SM) Dense, dark grey			-		-   -		
45		8\\	63 6''*				-	     	·   -		
50	- 1 - 4	<b>N</b>	47*	SILTY CLAY (CL)  Very stiff, dark grey, we have a second s	with some	sand	-	21	1	06	6590
55-				Less sand			-				
60-	10	9	8*	SILTY CLAY (CL) Very stiff, brown			-			-	
65-	ect No	45	945	Bottom of Boring a			-		. :		
	SCL 146	, IV	J-10	Geomatrix Co	nsultan	ts		F	igure	<b>A</b> -1	2

Pro	ject	:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	N	lo. 7	7
Date	Drille	ed:	9/16/85	Remarks:		<del></del>		<del></del>	
	of Bo								
Hamn	ner W	eight:	140 lbs.	(See Legend	Sheet	for sampler <b>b</b>			
Ft	gi)				0	ioi sampler g			mer weights TORY TESTS
Depth, F	Samples	Blows/Ft.	MATERIAL D	ESCRIPTI	ON		i i	tent,%	pof onfined pressive ength,
			Surface Elevation: 15±			<del></del>	┪┋	S S	Com Com
J			4" Asphalt Surfacing						
}			CLAYEY SAND FILL Dense, grey-brown, wit	h rock fra	gment	5	4		
5-			CLAYEY SAND FILL Loose, dark grey, with material and misc debr wood, bricks, etc.)	organic			- - - - -		
1			Becoming more clayey we slag and oily material	vith rocks Is	•		1		ļ.
-			•				1		
10							-		
			Rack				-		
]			•			İ	1		
15							1		
1					_				
1	i I		SANDY CLAY (CL)			1	7		
			Medium stiff to stiff, o	orange-bro	พก		1		
20-	'	16		ye bi O		-	25	100	2350
5-			Grading to grey-brown				1		
	2 2	21	sandy clay (CL) ♥			-	19	110	4780
4									
0-	3 3	34			· · · · · · · · · · · · · · · · · · ·		23	101	
oject I	No. 10	84B	Geomatrix C	Consulta	inte			igure A	12

1	Pro	ject	:	BAY CENTER PROJECT	·							
▕				Emeryville, California	Log	of	Boring		No.	<b>7</b>	ontinued	1
	Depth, Ft.	Samples	Blows/Ft.	MATERIAL DE	SCRIPTI	ON	Į.		Moisture Content, %	Ory Density, pcf	Unconfined Compressive Strength,	
	35-	4	<u>87</u>	SILTY CLAY (CL) Stiff, dark grey, with  SILTY SAND (SP-SM) Very dense, grey-brown	some sand				19	110		
	40— -	5	36	SANDY CLAY (CL) Stiff, dark grey					18	113	780	
	45	7	34	SILTY CLAY (CL) Very stiff, dark grey Becoming sandy clay				2		101	6340	
	0-	8 3	30	SILTY CLAY (CL) Very stiff, orange-brown Grading to grey silty c				35		87	4610	
Pro	oject l	No. 10	84B	Geomatrix Co	nsultani	te			Figur	 a Δ'	14	
	<del></del>				·surcen	- D			rigur	4 H-	14	

Project:	BAY CENTER PROJECT • Emeryville, California	Log	of	Boring	-	No.	8	
Date Drilled:	111 =	Remarks:			- "			
Type of Boring: Hammer Weight								
<del></del>	<del></del>	(See Legen	3 Sheet	for sampler ¢	ype			r weights) RY TESTS
Depth, Ft Samples Blows, Ft.	<u> </u>	DESCRIPT	ION			Moisture Content,%	Dry Density, pcf	Unconfined Compressive Strength,
<del></del>	Surface Elevation: 13±				1	-3	٥	⊃ ຜູ້"
	CLAYEY SAND FILL Medium dense, brown,	with grave	1		] -			
5-	CLAYEY SAND FILL Loose, brown, with concrete, bricks, ro	nstruction cks, steel)	debri )	s	-			
	Becoming black and c	oi ly			1 1 1			
10-1 3	SILTY CLAY FILL Soft, dark grey (less debris)				1 1 1 1	28	95	
2 18	SILTY SAND (SP-SM) Loose, dark grey, with	some shel	ls		1 1 1			
3 34	SILTY SAND (SP-SM)  Medium dense to dense,	orange-bro	own .		4-1-1	19	113	
25-4	Medium stiff, orange- sandy clay (CL)	brown,			1-1-1-1-1	18	112	2240
30 5 101 Project No. 10846	Becoming very dense  Geomatrix				-		ure A	15

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. <b>8</b>	Continued)
Samples Blows/Ft.	MATERIAL DE	ESCRIPTI	ON	į.	Moisture		
35 6 \\ \frac{59}{6''*}	SILTY SAND (SP-SM) Very dense, orange-brow	n					
7 57	SILTY SAND (SP-SM) Very dense, dark grey						
45 - 8 49*	SANDY CLAY (CL) Very stiff, dark grey				22	105	7270
9 32*	Grading to clayey sand				-16	115	1480
55—	SANDY CLAY (CL)  Very stiff, orange-brown			-			
60-	Becoming silty clay (C	L)		-			
10 46*	SILTY CLAY (CL) Stiff, gray-brown				31	90	2110
roj. No.	Geomatrix Co	nsultar	nts		Fig	jure A	-16

	Y CENTER PROJECT Emeryville, California	Log	of	Boring	No	. <b>8</b>	ontinued)
Samples Blows/Ft.	MATERIAL DE	SCRIPTION	ON	ŧ	Moisture Content, %		Unconfined Compressive Strength,
70—11 56*	Increasing sand conto	ent		-	21	105	6640
75-	GRAVELLY SAND (SW)  Very dense, orange-brow	D. with					
80—12 <u>81</u>	gravel to 1" diam.	, with		-			
90 13 72*	SILTY CLAY (CL)  Very stiff, light grey				23	101	<del>-</del> 4730
95—	Grading to grey-brown			-			
100 14 34 611 ± Project No. 1084B	Bottom of Borin				i	01 ire A-	7570

Pro	j e c	t :		Y CENTER PROJECT meryville, California	Log	of	Borin	g	No	o. 9	
Date	Drill	led·		9/13/85			<del> </del>				
Туре				4" Rotary	Remarks:						
Hamr		-		140 lbs.							
	<u> </u>	T			(See Legend	Sheet	for sampler	Hyp			
Depth, Ft	Samples	Blows/Ft.		MATERIAL (	DESCRIPTI	ON			Moisture T		Unconfined Compressive Strength, Strength, paf
			S	urface Elevation: 13±					ځ¥	, a	A F S
			L	10" Asphalt Surfacing				Т	1	<del>                                     </del>	+
				CLAYEY SAND FILL Medium dense, grey					1		İ
5-				CLAYEY FILL  Medium stiff, green-gr with organic material debris	ey, and misc.			-			
10				SILTY SAND FILL Loose, grey to black, wood and rock fragment:	with s (slag ?)						
15-	1 🛛	14		SILTY CLAY FILL Soft, black, with organ wood and glass (oily)	nic materia	ıt,					
1				SILTY SAND (SM-SP) Loose, black, with shel	ls			-			
20-	2	19		CLAYEY SAND (SC)  Medium dense, orange-br some gravel to 1/4" dia	own, with m.				21	106	990
25	3	30	•	Grading to silty sand	(SP-SM)				19	110	
30-	-1	24		SILTY CLAY (CL-CH) Stiff, dark grey	<u> </u>				37	82	3030
roject	No. 1	084B		Geomatrix	Consulta	ents		1	Fig	ure A	-18

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. <b>9</b>	ontinued)
Samples Samples Blows <sub>/Ft.</sub>	MATERIAL D	ESCRIPTI	ON	ţ	Moisture Content, %	Dry Density, pcf	
-	SILTY CLAY (CL-CH) Stiff, dark grey	***			-		
35— 5 28	SILTY SAND (SP-SM) Dense, brown to grey			_	 		
	} Stiff, silty clay (CL	-сн)					
6 44	SANDY CLAY (CL) Very stiff, dark grey		, , <u>, , , , , , , , , , , , , , , , , </u>				
7 44	SILTY CLAY (CL)  Very stiff, grey-brown			-	- 18	111	6090
50 - 8 25				-	29	93	3860
55—	SILTY CLAY (CL) Stiff, grey			-			
9 17					39	81	3420
	Bottom of Boring	at 60'					
65 — Project No. 1084B	Geomatrix C	· · · · · · · · · · · · · · · · · · ·				ure A	

Date Drilled: 9/12/85 Type of Boring: 4" Rotary Hammer Weight: 140 1bs. (See Lagend Sheef for sompler types and hommer weight  LABORATORY TEL  Surface Elevation: 12±  SURFACE SIND HILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Remarks:  LABORATORY TEL  SURFACE SIND FILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  10-  SILTY CLAY (CH) Soft, black, with organic material and debris  Thoreasing gravel content  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  SILTY CLAY (CL-CH) Stiff, orange-brown TBecoming very stiff  V  SILTY SAND (SP-SM) Very dense, orange-brown SILTY CLAY (CL-CH) Stiff, gray SILTY CLAY (CL-CH)	Project:	-	BAY CENTER PROJECT Emeryville, California	Lon	n f	Borin	ď			<u> </u>
Type of Boring: 4" Rotary Hammer Weight: 140 1bs. (See Legend Sheet for sampler glypes and hommer with the sampler bypes and hommer with the sampler glypes and hommer with glypes and hommer with glypes and hommer with glypes and hommer with the sampler glypes and hommer with glypes and homer glypes and hommer with glypes and hommer w	Date Orilles		9/12/85	L			9		<del></del>	0
Hammer Weight: 140 lbs.				Remarks:		<del></del>				
Surface Elevation: 12±  Surface Elevation: 12±  Surface Elevation: 12±  Surface Elevation: 12±  Surface Elevation: 12±  Surface Elevation: 12±  Surface Elevation: 12±  CLAYEY SAND FILL  Loose, dark brown, with organic material and debris  (wood, bricks, glass, etc.)  CLAYEY FILL  Soft, black, with organic material and debris  Rock fragments (slag?)  SANDY CLAY (CL)  Stiff, orange-brown, with some grave!  Thoreasing gravel content  SILTY CLAY (CL-CH)  Stiff, orange-brown  Becoming very stiff  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  Silty CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown  SILTY CLAY (CL-CH)  Stiff, orange-brown	1				<del></del>	·				
MATERIAL DESCRIPTION  Surface Elevation: 12±  S'' Concrete Slab FILL Medium dense, clayey gravel  CLAYEY SAND FILL Loose, dark brown, with organic materials and misc, debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  TRock fragments (slag ?)  V  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  20 21 20 21 21 22 23 25 21 21 25 27 27 27 27 27 27 27 27 27 27 27 27 27	<u> </u>	<del></del>		(See Legend	Sheet	for sompler	gtyp			
Surface Elevation: 12±  Sil Concrete Slab FILL Medium dense, clayey gravel  CLAYEY SAND FILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Rock fragments (slag ?)  SILTY CLAY (CH) Stiff, orange-brown, with some gravel Tincreasing gravel content  20 SILTY CLAY (CL-CH) Stiff, orange-brown  Becoming very stiff  25 3 52  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590		Ŧ.								
Surface Elevation: 12±  Sii Concrete Slab FILL Medium dense, clayey gravel  CLAYEY SAND FILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Rock fragments (slag ?)  SILTY CLAY (CH) Stiff, orange-brown, with some gravel Thoreasing gravel content  20  SILTY CLAY (CL-CH) Stiff, orange-brown  TBecoming very stiff  25  3 52  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	1 E   E	SMO	MATERIAL D	<b>ESCRIPTI</b>	ON			وم	ڇُ ا <sup>ڇ</sup> ُ	8 ≥ €
Silty Clay (CL)   Stiff, orange-brown   Tacoming very stiff	å	<u> </u>	•					stu	9 9	Dog of the control of
Silty Clay (CL)   Stiff, orange-brown   Stilty Clay (CL-CH)   Stiff, orange-brown   Stilty Clay (CL-CH)   Stiff, grey   27 97 4590			Surface Elevation: 12±	<del></del>				<b>–</b> 🕏	בונים   ביים	Str
FILL Medium dense, clayey gravel  CLAYEY SAND FILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Rock fragments (slag ?)  SILTY CLAY (CH) Soft, blue-grey  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  20 2 20 SILTY CLAY (CL-CH) Stiff, orange-brown  TBecoming very stiff  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590			5" Concrete Slab	<del></del>				+-`	<del>-                                     </del>	3
CLAYEY SAND FILL Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  TRock fragments (slag ?)  SILTY CLAY (CH) Soft, blue—grey  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  SILTY CLAY (CL-CH) Stiff, orange-brown  Becoming very stiff  SILTY SAND (SP-SH) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	1 1 11	1	FILL					4	İ	
Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Rock fragments (slag ?)  SILTY CLAY (CH) Soft, blue—grey  SANDY CLAY (CL) Stiff, orange-brown, with some grave!  Tincreasing gravel content  20 2 SILTY CLAY (CL-CH) Stiff, orange-brown  TBecoming very stiff  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	-	L	Medium dense, clayey gr	avel			- {	1	ł	İ
Loose, dark brown, with organic materials and misc. debris (wood, bricks, glass, etc.)  CLAYEY FILL Soft, black, with organic material and debris  Rock fragments (slag ?)  SILTY CLAY (CH) Soft, blue—grey  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  20 21 22 23 21 21 24 25 25 25 27 28 28 29 29 29 29 20 20 20 21 21 22 23 21 21 24 25 26 27 27 27 27 27 28 28 29 29 29 29 20 20 20 20 21 21 22 23 21 24 25 26 27 27 27 27 27 27 27 27 27 27 27 27 28 28 28 28 28 28 29 29 20 20 20 21 21 22 23 24 25 26 27 27 27 27 27 27 27 27 27 27 27 27 27		- }			-		٦.	ľ		1
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Soft, black, with organic material and debris  TRock fragments (slag?)  SILTY CLAY (CH) Soft, blue-grey  SANDY CLAY (CL) Stiff, orange-brown, with some gravel Tincreasing gravel content  20 SILTY CLAY (CL-CH) Stiff, orange-brown  TBecoming very stiff  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	4							_		ļ
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Stiff, orange-brown, with some gravel Tincreasing gravel content  20 SILTY CLAY (CL-CH) Stiff, orange-brown  The common stiff  25 3 52 SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	7 /		SANDY CLAY (CL)		··		┥╶		ſ	
Thereasing gravel content  20 SILTY CLAY (CL-CH) Stiff, orange-brown  TBecoming very stiff  25 3 52 SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	7 11	- 1		h some gra	ve l		-			
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TBecoming very stiff  52  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27  97 4590			Stiff, orange-brown				▍┤	-,	' ' '	
25-3  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27  97 4590	7 11	1	<del>-</del>				┨┥		ł	
25-3 52  SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	1		TBecoming very stiff				]		ļ	[ ]
SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	4 []		1				1			l
SILTY SAND (SP-SM) Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	25	Ì	*				]			<b>'</b>
Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	3 \ 52						H			}
Very dense, orange-brown  SILTY CLAY (CL-CH) Stiff, grey  27 97 4590	[ [				·		I⊢I			
30 4 23 SILTY CLAY (CL-CH) Stiff, grey 27 97 4590							4			
27 97 4590	4		very dense, orange-brown							ı
27 97 4590	4 11			_		i	7			
27 97 4590	<sub>30</sub>		SILTY CLAY (CL-CH)				7			J
Project No. 1094P	~   4 <del> </del>   23						$\dashv$	27	97	4590
roject No. 1084B Geometrix Consultation	<u> </u>					ľ	4		"	ا ۵٫۰۰
Geomatrix Consultants Figure A-20	roject No. 1084	4B	Geomatrix C	onsuita	nts		+	Fin	ure A	-20

Project:	BAY CENTER PROJECT Emeryville, California	Log of	Boring		(Co	ntinued:
Samples Blows, Ft.	MATERIAL D	ESCRIPTION	ŧ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength,
	SILTY CLAY (CL-CH) Stiff, grey			-		- 8
35 - 5 105	SILTY SAND (SP-SM) Very dense, grey-brown		-			
	SILTY CLAY (CL-CH) Stiff, grey			- - - -		-
6 110	SILTY SAND (SP-SM) Very dense, dark grey			 -		
7 18	SANDY CLAY (CL) Stiff, dark grey		-	23	102	2020
8 66	Becoming light grey and very stiff		-	17	101	7490
	Bottom of Bor	ing at 51½'	-			
55—			-			
50-			-   -			
4			-			
55			_		ure A	·

Pro	ject	:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	11	
Date	Drille	 ed:	9/10/85 and 9/12/85	I Remarks:				**		<del></del>
			4" Rotary							
1	ner W		1/0 16-	(See Legens	Sheet	for sampler t	VOA	e and i	0.0000	waishtal
		<del></del>				TOT SOMPLET I	<b>J</b> p 6.			RY TESTS
Depth, Ft.	Samples	Blows/Ft.		DESCRIPTI	ON			Moisture Content,%	Density, pcf	Unconfined Compressive Strength,
		,	Surface Elevation: 11±			<u> </u>		23	Dry	5ვ‴
			4" Asphalt Surfacing				┥		ł	
-				edium dense, ock fragment			] - _			
			CLAYEY FILL Soft, dark brown, wi	th misc. deb	ris		-			
ا ۽ ا			wood, glass, slag,	etc.)				]		
5			9/11/85				-			
<b>!</b> ⊢	.		7:00am \ Wood				-	1		
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	1 N	2	SILTY CLAY (CL-CH)					44	76	
7			Soft, dark grey, wit	h some shell	s				• -	
15	-						l			
4	1						_			
	1 1			<del></del>			1			
7										
-	. H	ا مہ ا	SANDY CLAY (CL)	• - 4			-	22	100	6220
	2	25	Stiff, orange-brown,	with some				22	105	6330
	H		gravel							
20-	1									
∣							4			
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	3	38					╽┤			
`	١١/ د	ا ٥ر	SILTY SAND (SP-SM)				4			
25-	H		Dense, brown				لـ ا			
	11									
4			<b>,</b>				-			
			Stiff, grey, silty							
1	4 \[\]	25	∫clay (CL-CH)				1	27	95	3330
-	$\mathcal{N}$						╽┤			<del>-</del>
30-										
							Ц			
Projec	t No. '	1024R	C	iv Consult	tante			E :.	nura A	_22

Project: B	AY CENTER PROJECT					
	Emeryville, California	Log	of Bor	ing	No.	11 (Continued)
Depth, Ft. Samples Blows/Ft.	MATERIAL DE	SCRIPTION	l	ţ	Moisture Content, %	Dry Density, pcf Unconfined Compressive Strength,
5 26	SILTY SAND (SP-SM) Dense, brown SILTY CLAY (CL)			-	28	94 2020
6 39	Stiff, dark grey			-	26	97 2550
7 30	GRAVELLY SAND Dense, grey-brown  SANDY CLAY (CL-CH) Stiff to very stiff, grey	,			23 10	2380
8 25	SILTY CLAY (CH)  Very stiff, grey, with so				27 9	5470
9 46	Becoming brown				No Rec	overy
10 39	SILTY SAND (SM-SP) Dense, blue-grey, with alt				-	
65—	of stiff silty clay  SANDY CLAY (CL)  Very stiff, brown mottled		rata	21	1 105	5610
Project No. 1084B	Geomatrix Co	nsultants	3		Figure	A-23

Project:	BAY CENTER PROJECT		- I	D	<u> </u>			
	Emeryville, California	Log	01	Boring		0. 1	(Continued	<u>)</u>
Depth, Ft. Samples Blows/Ft.	MATERIAL DES	SCRIPTIO	N	į	Moisture	Content, %	Def Unconfined Compressive Strength,	180
	SANDY CLAY (CL)  Very stiff, brown mottle	d with gre	∍у		1		- 8	
12 \ 49				_	4			
70-	GRAVELLY SAND (SW) Dense, orange-brown		-		-   			
	GRAVELLY CLAY				]			
75-	Very stiff, orange-brown				11  -  -	1	3700	
	SILTY CLAY (CL)		·		4			
14 32	Very stiff, light grey				   21	10	7220	
80-	Becoming sandy clay			-				
15 46					21	10	7760	
85-	CLAYEY SAND (SC) Dense, orange-brown, with some gravel to 3/4"	,		-				
16 73					-			ĺ
90-101	SANDY CLAY	<u>.</u>			15	11	7 4280	
	Very stiff, orange-brown			-	1			
17 90				-	17	11;	7180	
95	GRAVELLY SAND (SP)		<del></del> -					
	Very dense, orange-brown, gravel to 1½" diam.	with		-				
18 84	Bottom of Borin	g at 99½'			16	111	2960	
Project No. 1084B	Geomatrix Con	sultant				igure	A-24	ĺ

Pro	jec	t :	BAY Er	CENTER PROJECT neryville, California	Log	of	Boring		No.	12	
Date	Dril	led:_		9/19/85	Remarks:						
Туре	of B	oring:		6" Auger							
Hamn	ner V	Veight	:		(See Legend	Sheet	for sampler #y	pes			
F1.	en	-									TESTS
Ē	Samples	* * * * * * * * * * * * * * * * * * *		MATERIAL I	DESCRIPTI	ON			2%	sity	ned isive
Depth,	Sa	Blows/Ft.	1						istu teni	Den Pc1	confi pres reng ps f
	i			urface Elevation: 14±					Moisture Content,%	Dry Density, pcf	Unconfined Compressive Strength, psf
				2" Asphalt Surfacing, 4"	' Aggregate	Base					
] -			H\	SANDY GRAVEL FILL				7			
-				Grey with some cobbles	5		/	-			
-				SILTY CLAY FILL			]	-			
				Dark grey, with sand a	nd gravel		1				
ا ا				and some bricks							
5-											
1 1								1			
			<b>—</b>					Ⅎ	ĺ		
-	l			Bottom of Bor	ing at 7'		ł	$\dashv$			
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Projec	t No.	1084	3	Geomatrix	Consult	ants		1	Figu	ле А-	-25

	ject		BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	13	
Date	Drill	ed:	9/19/85	Remarks:						
Туре	of Bo	oring:_	6" Auger							
Hamr	mer W	/eight:		(See Legend	1 Sheet	for sompler thy	pes			
Ft.	5	T :			<del></del>					Y TESTS
Depth,	Samples	Blows/Ft.	MATER	RIAL DESCRIPTI	ION			Moisture Content, %	Density, pcf	Unconfined Compressive Strength, psf
<b> </b>	<u> </u>	<u></u>	Surface Elevation:	12±				နိုင္ပံု	٥ry	Unc Com St
		1	2" Asphalt Surfac		Base			<u> </u>		-
<b>I</b> →	1		SILTY CLAY FILL				-		•	
-	<b>∤</b>		Brown, with grav	vel			-			
<b>I</b>	1		SILTY CLAY FILL				4			
]	]			wood, metal, bri	cks,	ĺ				
			and wire							
5	1		4	····			٦			
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	1		Bottom	of Boring at 5'	÷		$\dashv$			
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Projec	ct No.	1084B	Geor	natrix Consult				 Fial	ıre A-	-26

Project	t :	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	14	
Date Drill	ed:	9/19/85	Remarks:					
Type of Bo			nemarks;					
Hammer W			1500 10000					<del></del>
			(See Legeno	Sheet	for sampler typ			
Depth, Ft Samples	Blows/Ft.	MATERIAL D	ESCRIPTI	ON		Moisture Content, %	Density, pcf	Unconfined A Compressive 1 Strength, S
		Surface Elevation: 12±	<del> </del>	<del></del>		- Se i	Dry (	Str.
	Ţ	2" Asphalt Surfacing, 4"	Aggregate	Race		+ -	۵	73
		SANDY GRAVEL FILL	nggi egate	0036		]		
		Grey, with some cobbles	<b>,</b>		/	1 1		
		SILTY CLAY FILL				1 1		
7 1		Grey, with sand and gra	1			- !		
	[		ive i			]	ļ	
5-		SILTY CLAY FILL					l	
		Dark grey, with bricks,	wood, roo	:ks,	/	1 1		
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:

	Probe	: A Date: 9-3-86	Location: On Pad C							
	Depth	Composition	Comments							
	0 - 5	Clean Soil Rock Wood, Brick	Debris shallow							
	5 ~ 10	Clay Silt Clay	Bottom of debris at 7' No sample Water at 9'							
	10 - 15									
	15 - 20									
	Datum is Water Line									
•			Town . 60.2°F							
		epth: 9'	Temp.: 69.2°F							
h		el (ft): 6								
Bentonite (ft): 1			Soil (ft): 4							

	Probe:	B Date: 9-3-8	6 Location: On Pad C							
	Depth	Composition	Comments							
	0 - 5	Clean Fill Rocks								
	5 - 10	Debris Clay, few wires Some metal, wood	8' Sample at ~ 10', pH 7.2							
	10 - 15	More clay Brick Metal	End of debris at 13'							
•	15 - 20	Silt								
I	Datum is Water Line									
		epth: 20'	Temp.: 69.1°F							
3	5/8" Peagrave	el (ft): 6	Soil (ft): 1							
) <sub>E</sub>	entonite (ft	:):	Soil (ft): 4							

Probe:	C Date:	9-3-86	Location: On Pad C						
Depth	Composition	1	Comments						
0 - 5	Clean soil Rock, wood Brick								
5 - 10	Clean soil, Clay		Sample at 8', too dry to determine pH						
10 - 15	Wood scraps at 12† ·	- 13'	Water at 14'						
15 - 20									
Datum is Water Line									
Final Bore D	epth: 14'		Temp.: 71°F						
	el (ft):8	· —	Soil (ft): 1						
Rentonite (f	t)· 1		Soil (ft): 4						

Probe	Date: 9-3-86	Location: Behind Pad C
Depth	Composition	Comments
0 - 5	Clean soil Charred wood Rocks, bricks	
5 - 10	Dirt Bricks Silt	Sample at 5' - 6' too dry to determine pH Water at 7.5'
10 - 15		
15 - 20		
Datum is Wat	er Line	
	epth: 7.5'	Тетр.: 68.2°F
	el (ft): 3	Soil (ft): 0.5
Bentonite (f	t): 0.5	Soil (ft): 3

Probe	E Date: 9-3-86	Location: Behind Pad B				
Depth	Composition	Comments				
	Clean soil	·				
0 - 5						
	Dark soil	Start of debris at 7'				
5 - 10	Rock	Sample at 8', pH 7.6				
	Glass Metal, brick, ash	Water at 10'				
10 - 15						
15 - 20						
15 20						
•		<u></u>				
Datum is Wat	er Line					
Final Bore D	Final Bore Depth: 10' Temp.: 70.8°F					
3/8" Peagrav	el (ft):4.5	Soil (ft):1				
	t):1	Soil (ft): 4				

Probe	E F Date: 9-3-86	Location: Behind Pad A, near fence
Depth	Composition	Comments
0 - 5	Brick Wood	Debris shallow
5 - 10	Same Dark soil Metal	Sample at 6½', pH 7.6 Water at 7'
10 - 15		
15 - 20		
Datum is Wat	er Line	
Final Bore D	epth: 7'	Тетр.: 70.5°F
3/8" Peagrave	el (ft): 3	Soil (ft):
Rentonite (f	t) - 0.5	Soil (ft): 3

	Probe:	: <u>G</u> Date: <u>9-3-86</u>	Location: Behind Pad A							
	Depth	Composition	Comments							
	0 - 5	Asphalt Rock, brick Green soil Metal								
	5 - 10	Metal Brick Wood, rags Ash	4' of fill, rest clay No sample							
	10 - 15		Water at 14'							
	15 - 20									
,	Datum is Water Line									
•		epth: 14'	Temp.: 76.8°F							
		el (ft): 8	Soil (ft): 1							
•	Bentonite (f	t):1	Soil (ft): 4							

Probe:	H Date: 9-3	3-86	Location:	Behind Pad A
Depth	Composition		Comments	<b>3</b>
	Asphalt			
0 - 5	Rocks, green soil			
0 - 3	Brick, wire			
*	Clay, rock	Te	op of debris at	612'
5 - 10	Wood, brick	B	ottom of debris	81 <sub>2</sub> †
	Ash	Wa	ater at 10'	
		No	o sample	
10 - 15				
			, ,	•
15 - 20				
Datum is Wat	er Line			
Final Bore D	epth: 10'		Тетр.:	71.9°F
	el (ft): 4.5', brought up		Soil (ft):	0.5
Rentonite (f	<b>+)·</b> 1		Soil (ft):	7 5

Probe:	<u>I</u> Date: 9-3-8	36 Location: On Pad B
Depth	Composition	Comments
0 - 5	Clean soil Rocks Brick, dark soil	
5 - 10	Ash, glass Wire Wood bits	Start of debris at 6' Sample at 9', pH 7.6
10 - 15	Brick	Water at 13'
15 - 20		
Datum is Wate	er Line	
Final Bore D	epth:13'	Тепр.: 70°F
3/8" Peagrave	el (ft):	Soil (ft): 1
Bentonite (f	t): 1	Soil (ft): 4

# BAY CENTER CONSTRUCTION SITE / ~ \ Emeryville, CA.

Probe:	<u>J</u> Date: 9-3-86	Location: On Pad A		
Depth	Composition	Comments		
	Clean dirt			
0 - 5	Rubble, grit			
5 10	Wood, steel	Start of debris at 6'		
5 - 10	Debris, brick	Sample at 7', pH 7.5		
	Ash, black & oily	Debris layer is 1.5'		
		Water at 10'		
10 - 15				
15 - 20				
Datuma is Water Line				
Final Bore D	epth:	Temp.: 78°F		
3/8" Peagrave	el (ft): 4.5	Soil (ft): 1		

Soil (ft): \_\_4

Bentonite (ft): 1

Probe	K Date:	9-3-86	_ Location:	On Pad A
Depth	Composition		Comment:	S
	Clean dirt			
0 - 5				
	Few bricks		Ash layer about	2*
5 - 10	Ash - 7'		Sample at 8', pH	7.6
	Rubble			
	Very few decomposable	es	Water at 12.5'	
10 - 15				
_				
15 - 20				
				·
Datum is Wat	er Line			· · · · · · · · · · · · · · · · · · ·
Final Bore D	epth: 12.5'		Temp.:	72.7°F
3/8" Peagrav	el (ft): 6.5		Soil (ft):	1
	1		- Soil (ft):	

Probe	L Date: 9-3-86	Location: On Pad B		
Depth	Composition	Comments		
0 - 5	Dirt & rocks Clean soil Red brick			
5 - 10	Ash, debris Charred wood Steel	Start of debris at 6' Sample at 8', pH 7.6 Water at 10'		
10 - 15				
15 - 20				
Datum is Water Line				
	epth: 10'	Тетр.: 69.4°F		
	el (ft): 4.5			
i I	t):1	Soil (ft): 4		

Probe	: <u>M</u> Date: 9-3-86	Location: Behind Pad B
Depth	Composition	Comments
0 - 5	Charred wood Green soil Brick, wood	
5 - 10	Brick, wood Metal Debris	Sample at 8½', pH 7.6 Water at 10½'
10 - 15		This probe was buried in dirt by a Caterpillar operator and was not sampled further.
15 - 20		
Datum is Wat	er Line	
	epth: 10½'	Temp.: ND
	el (ft): 4.5	Soil (ft): 0.5
Bentonite (f	t):1	Soil (ft): 3.5

### WEST COAST ANALYTICAL SERVICE, INC.

GETTY SYNTHETIC FUELS, INC. IENT:

MPLE: A2502

ANALYSIS TYPE: GAS PHASE VOLATILE COMPOUNDS

where

### ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED:

09/19/86

GCMS FILENAME:

4104G1

LEVEL:

LOW

MATRIX:

GAS

DATE PREPARED:

10/02/86

DATE ANALYZED:

10/02/86

STANDARD ID:

GAS134, 137

INSTRUMENT ID:

5100

SAMPLE AMOUNT:

1ML

CAS #	COMPOUND		PPB (V/V)	DETECTION LIMIT
74-87-3	CHLOROMETHANE	======================================	======== ND	
74-83-9	BROMOMETHANE		ND D	100. 100.
75-01 <b>-4</b>	VINYL CHLORIDE		120.	
75-00-3	CHLOROETHANE		ND	100.
75-09-2	METHYLENE CHLORIDE		ND DN	100. 100.
67-64-1	ACETONE		ND	100.
107-02-8	ACROLEIN		ND	100.
107-13-1	ACRYLONITRILE		ND	100.
75-15-0	CARBON DISULFIDE		ND	100.
75-35 <del>-4</del>	1, 1-DICHLOROETHENE		ND	100.
75-34-3	1,1-DICHLOROETHANE		ND	100.
6-60-5	TRANS-1, 2-DICHLOROETHENE		ND	100.
540- <b>59</b> -0	CIS-1, 2-DICHLOROETHYLENE		ND	100.
109-99-9	TETRAHYDROFURAN		ND	100.
75-71-B	DICHLORODIFLUOROMETHANE		ND	100.
75-69-4	TRICHLOROFLUOROMETHANE		ND	100.
76-13-1	FREON-TF		ND	100.
106-93-4	ETHYLENE DIBROMIDE		ND	100.
123-91-1	1, 4-DIOXANE		ND	100.
96-12 <del>-8</del>	1, 2-DIBROMO-3-CHLOROPROPANE		ND	100.
67- <b>66-3</b>	CHLOROFORM		ND	100.
107-66-2	1,2-DICHLOROETHANE		ND	100.
78-93-3	2-BUTANONE		ND	100.
71-55-6	1, 1, 1-TRICHLORDETHANE		ND	100.
16 <b>-23-5</b>	CARBON TETRACHLORIDE		ND	100.
108-05-4	VINYL ACETATE		ND	100.
75-27-4	BROMODICHLOROMETHANE		ND	100.
79-34 <b>-5</b>	1, 1, 2, 2-TETRACHLOROETHANE		ND	100.
78-87-5	1,2-DICHLOROPROPANE	-	ND	100.
10061-02-6	TRANS-1, 3-DICHLOROPROPENE		ND	100.
79-01-6	TRICHLOROETHENE		ND	100.
124-48-1	CHLORODIBROMOMETHANE		ND	100.
79-00 <b>-5</b>	1, 1, 2-TRICHLOROETHANE		ND	100.
71-43-2	BENZENE		ND	100.
10061-01-5	CIS-1.3-DICHLOROPROPENE		ND	100.
110-75-8	2-CHLOROETHYLVINYL ETHER		ND	100.
-25-2	BROMOFORM		ND	100.
T19-78-6	2-HEXANONE		ND	100.
108-10-1	4-METHYL-2-PENTANONE		ND	100.

### WEST COAST ANALYTICAL SERVICE, INC.

GETTY SYNTHETIC FUELS, INC. .IENT:

AMPLE: A2502

ANALYSIS TYPE: GAS PHASE VOLATILE COMPOUNDS

### ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED:

09/19/86

GCMS FILENAME:

4104G1

LEVEL:

LOW

MATRIX:

GAS

DATE PREPARED:

10/02/86

DATE ANALYZED:

10/02/86

STANDARD ID: SAMPLE AMOUNT: GAS134, 137 1ML

INSTRUMENT ID:

5100

<b>G</b> 11 11	 	• •	

CAS #	COMPOUND	CONC:	PPB	(V/V)	DETECTION LIMIT
			====	======	
127-18-4	TETRACHLORDETHENE			ND	100.
108-88-3	TOLUENE			ND	100.
108-90-7	CHLOROBENZENE			ND	100.
100-41-4	ETHYLBENZENE			ND	100.
100-42-5	STYRENE			ND	100.
95-47-6	TOTAL XYLENES			ND	100.
108-41-8	M-CHLOROTOLUENE			ND	100.
541-73-1	1,3-DICHLOROBENZENE			ND	100.
106-46-7	1,4-DICHLOROBENZENE			ND	100.
95-50-1	1,2-DICHLOROBENZENE			ND	100.
91-20-3	NAPHTHALENE			ND	100.

DATA: 4104G1 #1861 CALI: 82586C1 #3 SCANS 170 TO 2100 10/02/86 17:44:00 SAMPLE: GETTY - A2502 1ML CONDS.: 30M X 0.32MM DB-1 RANGE: G 1,2100 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3 50.07 194560. RIC 202 500 4:35 1000 9:10 1500 13:45 2000 18:20 **SCAN** TIME

10V 03 1986

## RESULTS OF MONITORING OF THE BAY CENTER SITE FOR CALDERON BILL COMPLIANCE

### PREPARED FOR BAY CENTER ASSOCIATES

bу

GSF ENERGY INC.
OCTOBER 9, 1986

### TABLE OF CONTENTS

		<u>Page</u>
1.0	Summary of Results	1
2.0	Site Description	2
3.0	Methods 3.1 Site Walk 3.2 Probe Installation 3.3 Gas Sampling 3.4 GC/MS Analysis	3
4.0	Results 4.1 Site Walk 4.2 Gas Analysis 4.3 Probe Pressure	5
5.0	Conclusions	6

### LIST OF EXHIBITS AND APPENDICES

Exhibit 1. Map of the Bay Center Construction Site

Exhibit 2. Probe Specifications

Appendix 1. Test Borings (Geomatrix Consultants)

Appendix 2. GC/MS Results

#### 1.0 SUMMARY OF RESULTS

The prescreening procedures prescribed in "Guidelines for AB 3525" were performed at the Bay Center construction site on September 3, 1986. No levels of methane above 5 ppm were found on a site walk using a flame ionization detector. Gas from a probe that was centrally located on the construction site contained 5.5% methane. Other than 120 ppb of vinyl chloride, no other list 1 compounds were found at the 100 ppb detection limit.

GSF recommends that no further testing be made of the site for the following reasons:

- 1. Virtually no methane was found above the construction site surface.
- 2. Test borings done on the site do not indicate sufficient organic materials to create a gas migration problem off site. Visual inspections of spoils from excavations indicate that mostly inert materials were deposited in the site.
- 3. The probe had less than 0.01" water pressure, indicating an extremely low generation rate.
- 4. The site is of sufficiently small size that the impact on the total air quality of the Bay Area should be negligible.

#### 2.0 SITE DESCRIPTION

The Bay Center Project is located in the City of Emeryville west of Bay Street, east of Lacoste Street and Highway 80, north of 64th Street and south of 65th Street (Exhibit 1). The site encompasses 16.5 acres. Three low rise office buildings and adjacent parking areas are currently under construction. Prior to its development as an office center, the site was used as a truck terminal by Garrett Freight lines.

The area was reclaimed from the San Francisco tidal plain after the construction of the East Shore highway in 1954. The site was filled by the City of Emeryville in the late 1950's. Fill materials were reported to be clean fill and non-municipal wastes (heavy metals and petroleum products were found). The site is basically flat, although it slopes gently to the north.

In 1985 a geotechnical study was performed by Geomatrix Consultants to provide engineering data prior to site development. As part of this study, 14 test borings were made (see Appendix 1). The study found that the upper 1.5 to 2.5 feet of soil was generally pavement materials and imported fill. A dark colored heterogeneous fill of sand, clay and construction debris was encountered below the pavement and imported fill materials and extended to a depth of 6 to 10 feet below grade. A layer of soft silty clay or loose sand was encountered below the heterogeneous fill and extended to a firm soil at a depth of 15 to 20 feet below grade. These are presumably natural deposits. No evidence of standard municipal refuse or paper products was found.

#### 3.0 METHODS

#### 3.1 Site Walk

The site walk was conducted on the morning of September 4, 1986. A Heath DETECTO-PAC II flame ionization detector was used for the site walk. The instrument was calibrated as per the implementation guidelines, and was held a constant 3 inches above the ground by attaching the sample probe to a measuring wheel. The site was walked in an s-shaped pattern, starting in the north west corner, using a 50 foot distance between traverses of the site. Wind speed was monitored periodically during the walk.

### 3.2 Probe Installation

A centrally located area that was accessible to a drill rig (there was construction activity during the landfill test) was chosen for probe installation for AB 3525 monitoring. Since it was desired that refuse samples be taken, the probe was installed using a 10" auger, with the specifications described in Exhibit 2. These specifications have been used by GSF Energy over the last 7 years and have been found to provide an airtight seal around the boring.

## 3.3 Gas Sampling

Gas was first measured using a portable MEXA NDIR meter. This meter had been calibrated with 3% calibration gas prior to use. Approximately 200 ml were hand pumped through the meter until no further increase in methane concentrations were shown.

Gas was sampled using a stainless steel sample pump fitted with tygon tubing and operated by a 12 volt power supply. The pump has a 1/2" coupling for a 0.5 liter stainless steel sample cylinder. The pump has a throughput rate of approximately 2 liter/min. The sample bomb was cleaned prior to use by dimethylchlorosilane. We used the silanized cylinder in preference to recommended Tedlar bags because the silanizing agent deactivates the sampler surface, reducing compound adsorption.

Prior to gas sampling, the system was first purged by operating the pump with both valves of the sample bomb open for 30 seconds. The sample was then obtained by closing the downstream valve with the pump running. The sample was collected for 45 seconds.

## 3.4 GC/MS Analysis

The samples were sent to West Coast Analytical Services for GC/MS analysis for List 1 compounds at a detection limit of 100 ppb. The stated detection limit of AB3525 was not applicable to the samples collected at Emeryville due to relatively high concentrations of low molecular weight alkanes (non-priority pollutants) which interfered with chromatographic separation, MS detection of the specified compounds at the ppb level.

## 4.0 Results

#### 4.1 Site Walk

Wind speeds were less than 5 mph during the site walk, which is typical for mornings in the Bay Area. No surface methane concentrations above 5 ppm were found. This is not surprising due to the absence of organic wastes noted in the well logs.

## 4.2 Gas Sampling

Methane content as determined by both NDIR and detailed chromatographic analysis was 5.5%. Analysis for trace components indicated that vinyl chloride was present at 120 ppb. None of the other compounds listed in Appendix 2 were detected at a detection limit of 100 ppb.

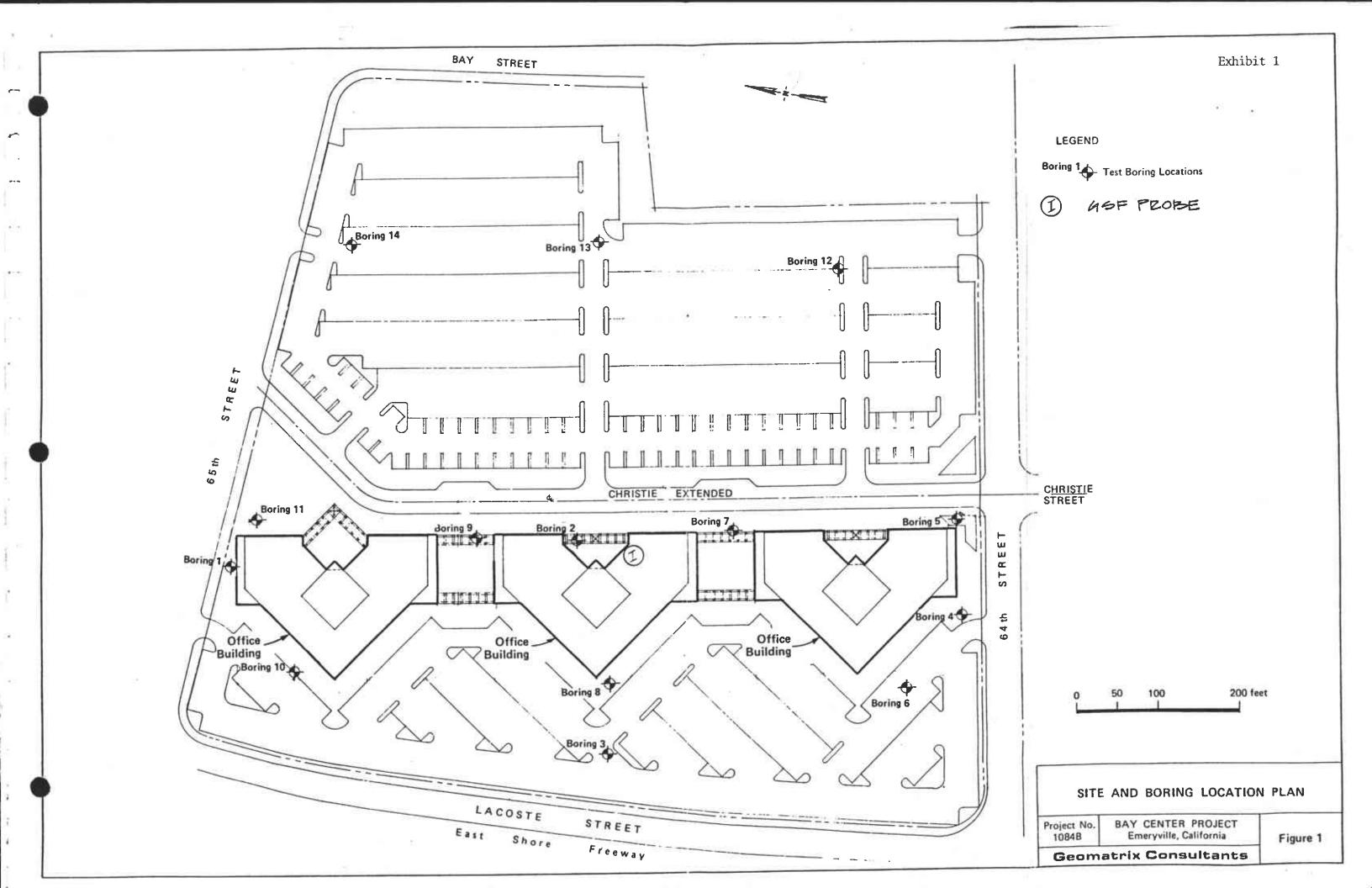
#### 4.3 Probe Pressure

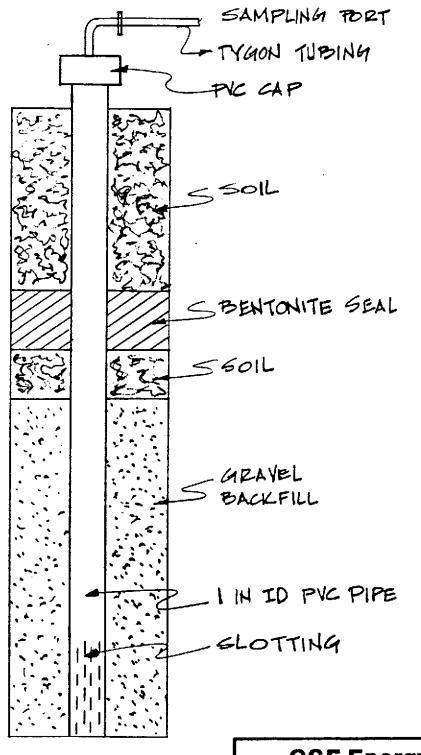
The probe pressure was 0.00" H20 which indicates the measured gas was most likely a trapped pocket from an extremely slow generating site, rather than an indication of active generation. GSF believes that a small amount of gas may have been generated by some of the waste oil which is noted in the well logs.

## 5.0 CONCLUSIONS

GSF does not recommend further testing of this site for several reasons:

- Generation of gas is extremely low and should decline over time.
- 2. No measurable gas was found during the site walk.
- 3. The site is of sufficiently small size that it would not significantly impact the air quality of the district.





# **GSF Energy Inc.**

PROBE

10-10-86 H.E.

G-A3-47

REV

Project: BAY CENTER PROJECT BORING LOG LEGEND SHEET Emeryville, California Date Drilled:\_\_\_\_\_ Remarks:\_\_\_\_\_ Type of Boring: Hammer Weight:\_ LABORATORY TESTS Blows/F1 Samples Moisture Content, % Dry Density, Unconfined Compressive Strength, psf DESCRIPTION ----- 2-Inch I.D. Modified California 10----- 3-inch diameter Shelby Tube Sampler 15 29 Blow Count with a 140-1b. Hammer Falling 30 inches Blow Count with a 280-lb. Downhole,
— "Slip-Jar" Hammer Falling 30 inches 29\* → through Drilling Fluid 20-25-Water Level Measured: ATD -At Time of Drilling 3 Hrs. ← In Hours or Days After Drilling 9/19/85 ← On Date Indicated 30-Project No. 1084B Geomatrix Consultants Figure A-1

Pro	jec	t :	В	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	. 1	
	Dril			4/23/85 8U Hollow Stom Augor	Remarks:_						
	of B			8" Hollow Stem Auger 140 lbs.							
	mer V	<del></del>	· · · · ·	140 105.	(See Legend	Sheet	for sampler b	ypes			
Depth, Ft	Samples	Blows, F.		MATERIAL D	ESCRIPTIO	NC _		_	Moisture Content, %	Density, pcf	Unconfined A Compressive T Strength, C Spr
				Surface Elevation: 11±					Σ္ပိ	ory O	5 g v
	]	],,	<u> </u>	10 <sup>14</sup> Asphalt Surfacing and	d Aggregate	: Base	: Material	Ţ_			
	1	$\frac{12}{6}$	7	GRAVELLY CLAY FILL Stiff, moist, yellow-br	rown						
	2	5	<del>11</del>	CLAY FILL Soft to medium stiff, be with misc. debris	brown to bl	lack,		-			
5-	3	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- A								~~~
				SILTY CLAY (CH) Soft, grey							
10-	4	3 6	ī.	→—Petroleum oder							
15-	5	20		SANDY CLAY (CL) Stiff, grey-green							
			<b>'</b>	SANDY CLAY (CL)  Very stiff, brown				1 1 1			
20-				SILTY SAND (SM)		12 10			Ē	•	
				Dense to very dense, br	'own			<del> </del>			
25-	6	50 4'	1	•							<b></b>
30-				SILTY CLAY (CH) Stiff, blue-grey							
Projec	Project No. 1084B		₽B	Geomatrix	Consult	antı	<u> </u>	ヿ	Fi	gure A	·-2

, [	Proj	ес	t :	В	AY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	(Co	ntinued)
	Depth, Ft.	Samples	Blows,		MATERIAL DE	ESCRIPTI	ON	ķ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
	35-	7	13/6	-	SILTY CLAY (CH) Stiff, blue-grey  SILTY SAND (SM) Medium dense, blue-grey						
	40-				Bottom of Boris	ng at 36'		-			
	45 -							-			
	50-							- - -			
	55							-			
	65—							- - -			
P	Project No. 1084B			В	Geomatrix C	onsulta	nts		Fig	ure A-	-3

Date Drilled: 4/23/85 Remarks:  Type of Boring: 8" Hollow Stem Auger  Hammer Weight: 140 lbs. (See Legend Sheet for sampler types and hammer LABORATOR  WATERIAL DESCRIPTION  Surface Elevation: 14 <sup>±</sup> 10" Asphalt Surfacing and Aggregate Base Material  1 27 6" CLAYEY SAND FILL	Y TESTS
Type of Boring: 8" Hollow Stem Auger  Hammer Weight: 140 lbs. (See Legend Sheet for sampler types and hammer  LABORATOR  MATERIAL DESCRIPTION  Surface Elevation: 14 <sup>±</sup> 10" Asphalt Surfacing and Aggregate Rase Material	Y TESTS
Surface Elevation: 14±  Surface Elevation: 14±  Surface Elevation and Aggregate Rase Material	Y TESTS
MATERIAL DESCRIPTION  Surface Elevation: 14±  10" Asphalt Surfacing and Aggregate Rase Material	Y TESTS
Surface Elevation: 14±	ج ج و م ج ج
10" Asphalt Surfacing and Aggregate Rase Material	Unconfined Compressive Strength,
1 10" Asphalt Surfacing and Aggregate Base Material CLAYEY SAND FILL	S S
] 1 2 6   CLAYEY SAND FILL   ]	-
- I all ball I Tarrica armine example .	
Medium dense, black, with misc. debris (burnt	
2 38 wood, metal, glass, copper wire and slag)	
Stiff, black silty clay layer	- ·-
5 3 26 SANDY CLAY FILL	
I	
Stiff, brown	
CLAYEY SAND (SC)	
Loose, blue-grey	
10 4 15 SILTY CLAY (CH) Soft, black and green Petroleum oder	
Soft, black and green  Petroleum oder	
Bottom of Boring at 10½'	
<b>]</b>	
<b>∄</b>	
I	
1 - 1   1   1   1   1   1   1   1   1	
<b>1</b>	
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<b> </b> '°	
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] -	
<u> </u>	
30-	
Project No. 1084B Geomatrix Consultants Figure A-	

Pro	ject:		BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	3	
Date	Drille	d:	4/23/85	Remarks:_						
Туре	of Bor	ing:	8" Hollow Stem Auger						<del></del>	
Hami	ner We			(See Legend	Sheet	for sampler ty	pes T	LABO	ammer RATOR	weights)
Depth, Ft.	Samples	Blows/Ft.		DESCRIPTION	ON	•		Moisture Content,%	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 12±					- 3		7 5
-	, 2	16 6''	14" Asphalt Surfacing an CLAYEY SAND FILL Medium dense, moist,				1			***
-	2	3 6''	metal and pyrite like SAND FILL				1 1			
5-	3	<u>2</u> 6''	SANDY CLAY FILL ATD Stiff, moist, brown SILTY SAND FILL Loose, black				1			****
10-	4	3 6"	SILTY CLAY (CH) Soft, blue-grey, with	some sand	layers	3	1 1 1 1		***	
			Bottom of Bori	ng at 11'			1 1 1			
15-							1 1			
20-	- - -						-			
							-			
25-	- - -						-			
	<b>-</b>			•			-			
30-	ject No.	. 1084	4B Geomatr	ix Consul	tant		_	Fi	gure A	\ \-5

Pro	ject	:	BAY CENTER PROJECT Emeryville, California	Log of B	oring	No	. 4	
	Drille		4/23/85	Remarks:		: .		
	of Bo							
	ner We	T	140 lbs.	(See Legend Sheet for	sompler typ			
Ē	les	Blows/Ft.						RY TESTS
Depth,	Samples	OWS	MATERIAL D	ESCRIPTION		ture nt o	Density, pcf	finec essiv ngth
Õ	ທ	m				Moisture Content,%	Dry De	Unconfined Compressive Strength, psf
<u> </u>		I	Surface Elevation: 13±		T		ā	> &
			12" Asphalt Surfacing and GRAVELLY CLAY FILL	d Aggregate base		4		
			Stiff, moist, yellow-b	rown		4		
		22	MIXED CLAY AND SAND FILL					
		<u>22</u> 6''	Black, with misc. debr	is		]		
5								
	2	3 6"	<b>⊸</b> Seepage			<b></b>		
<u> </u>						1		
			SILTY CLAY (CH)			7	ļ	
7			ATD Soft, black, with organ	nic material		1		
			,			4		
10-	3 7	1 611	← Petroleum oder		].	┦		
	1	6''				4		_
						4		
-						4		
1 -						4		
15	H	_2_			-	_		•
1 4	4 1	6''				]		
<b>l</b> 4			SILTY SAND (SM-SP)					
1 4			Loose, gray, with some	clay layers			]	
			20030, 9.4,, 20	Clay tayors		]		
20-						7		
[ " ]					]	7		ı
			(0.)			1		İ
			SILTY CLAY (CL)			1		İ
l 7			Very stiff, brown			1		I
l <sub></sub> 1						†		İ
25-	5	12 6''			-	┤ <u></u>		
	· H	6''	51177 5110 (SW SD)			1		
			SILTY SAND (SM-SP)	-		-		
-			Medium dense to dense,	brown		4		
1 -						4		
30-					-	<b>.</b>		
						1		
Projec	et No. 1	1084B	Geomatrix	Consultants		Fig	ure A-	<del></del>

Project:	BAY CENTER PROJECT Emeryville, California	Log of	Boring	No.	(Continued	)
Depth, Ft. Samples Blows/Ft.	MATERIAL D	ESCRIPTION	ļ	Moisture Content, %	Dry Density, pcf Unconfined Compressive Strength,	pst
35 - 6 \ \frac{15}{6''}	SILTY SAND (SM-SP)  Medium dense to dense,		-			
40— - - - -	➤ Bottom of Bor	ing at 36'	-   -   -   -			
45—			- - - -			
50-						
60-			-			
65— Project No. 1084E	3 Geomatrix	Consultant	-	Figi	ure A-7	

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Pro	ject	:	BAY CENTER PROJECT Emeryville, California	Log of Boring		No.	5	
Date	Drille	d:	9/18/85	Remarks:		·		
1	of Bo	_	_					
1	ner We		280 lbs.	(See Legend Sheet for sampler #	ypes			
Depth, Ft.	Samples	Blows/Ft.		DESCRIPTION		Moisture Content, % @	Density, pcf	Unconfined A Compressive EL Strength, LS psf
ļ	· · · · · · · · · · · · · · · · · · ·		Surface Elevation: 14±			Σ္	Dry	55°
5-			3" Asphalt Surfacing CLAYEY SAND FILL Dense, brown, with r CLAYEY SAND FILL Loose, dark brown, r (glass, wood, steel)	with misc. debris				
10	1	6*	SILTY CLAY FILL  Soft to medium stiff with misc. debris  Wood, brick, slag (			28	94	
15— - -	2	4*				No F	lecov	ery
20-	3	52*	GRAVELLY SAND (SW)  Dense, orange-brown		1 1 1 1	21	102	
25-	Ŋ	34* 31* -	SANDY CLAY (CL) Very stiff, orange-b	rown	1 1 1		ecov	ery
			SILTY SAND (SP-SM)		$\dashv$			
			•		$\dashv$	İ		
30-		76 6''±	Dense, orange-brown		<u> </u>			
Projec	roject No. 1084		Geomatr	ix Consultants	-	Fig	иге А	-8

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. 5	ontinued)
Depth, Ft. Samples Blows/Ft.	MATERIAL DI	ESCRIPTI	ON	ţ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength,
	SILTY SAND (SP-SM) Dense, orange-brown						
7 19*	SILTY CLAY (CL) Stiff, grey, with so	me sand		-	No	Recov	/ery
- 8 30*	SILTY SAND (SM-SP)				19	111	1920
9 63 611*	Very dense, dark grey	,					
45 10 36*	SILTY CLAY (CL) Very stiff, dark gray	<del></del>			22	104	6150
	Becoming sandy clay						
11 59*	Becoming grey silty cl	әу		-	20	108	6630
55—				-			
				-			
60 12 24*	Becoming dark grey and stiff			-  -  -	40	80	2600
				-			
65 — Project No. 1084B	Geomatrix Co	nsultar	nts		Fic	ure A-	.q

Proj	ect:		BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. 5	entinued)
Depth, Ft.	Samples	Blows/Ft.	MATERIAL DI	ESCRIPTI	ON	ķ	Moisture Content of	Dry Density,	Unconfined Compressive Strength, psf
70-	13	67*	SILTY CLAY (CL) Stiff, dark grey  SANDY CLAY (CL) Very stiff, orange-browsome gravel	vn, with			- 24	100	
80— - - - - - 85—	14	57*	GRAVELLY SAND (SW)  Very dense, orange-brow  SANDY CLAY (CL)  Very stiff, orange-brow			-	- 22	105	2580
90-	15	60*	SILTY CLAY (CL)  Very stiff, orange-brown with grey with some gray	ve l			22	104	5570
	16 No. 1		Bottom of Boring	g at 100'	nts		22 F	104	

•	Pro	ject	:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	6	
	Date	Drille	e d :	9/19/85	Remarks:						
			ring:_								
	Hamn	ner W	eight:	280 lbs.	(See Legend	Sheet	for sampler i	ype			
	Depth, Ft.	Samples	Blows/Ft.	MATERIAL D	ESCRIPTI	ON			Moisture Content, % B	Density, pcf	Unconfined A Compressive T Strength,
				Surface Elevation: 15±	···- <u>-</u>				Σ̈́ο	Dry	جَ قِ جَ
	5			SILTY CLAY FILL  Stiff, grey-brown, with misc. debris (metal, with misc. debris (metal)  Becoming soft and dar (debris includes brid glass, and metal)	ire, etc.) k grey	nd					
)	- - - 15	1	7*							•••	
		2	2*	SILTY CLAY (FILL ?) Soft, light grey, with streaking	dark grey			1 1 1	67	<b>59</b>	330
	20-	3	16*	CLAYEY SAND (SC)  Medium dense, grey, wit	h shells		<del>-</del>	1 1 1			
	25—	4	59* -	SILTY CLAY (CL) Stiff, orange-brown, wi  CLAYEY SAND (SC) Dense, grey-brown	th sand	•		1 1 1 1	-		
	Projec	5 No.	29* <b>1084</b> B	Geomatrix	Consulti	ents		-	19 <b>Fi</b> o	111 ure A	 -11

Project:	BAY CENTER PROJECT Emeryville, California	Log of	Boring	No. 6	Continued)
Depth, Ft. Samples Blows/Ft.	MATERIAL DE	SCRIPTION	į.	Moisture Content, % Dry Density,	Unconfined Compressive Strength,
35 — 6 \\ \frac{70}{6^{11}}*	CLAYEY SAND (SC)  Dense, grey-brown		-		
40-7 7 93*	SILTY CLAY (CL) Stiff, grey  SILTY SAND (SP-SM) Dense, dark grey		-		
45 8 63 611**			-		
50 - 9 47*	SILTY CLAY (CL)  Very stiff, dark grey,  Becoming sandier	with some sand	- - -	21 10	6 6590
55—	Less sand				
60-10 98*	SILTY CLAY (CL) Very stiff, brown		-		
65 — Project No. 1084	Bottom of Boring  Geomatrix C	, <u>, , , , , , , , , , , , , , , , , , </u>		Figure /	A-12

Project: **BAY CENTER PROJECT** Log of Boring No. 7 Emeryville, California Date Drilled:\_\_ <u>9/16/85</u> Remarks: 4" Rotary Type of Boring:\_ 140 lbs. Hammer Weight: (See Legend Sheet for sampler types and hammer weights) LABORATORY TESTS ī Samples Moisture Content,% Dry Density, pcf Unconfined Compressive Strength, psf Depth, MATERIAL DESCRIPTION Elevation: Surface 15± 4" Asphalt Surfacing CLAYEY SAND FILL Dense, grey-brown, with rock fragments CLAYEY SAND FILL Loose, dark grey, with organic material and misc debris (metal, glass, 5. wood, bricks, etc.) Becoming more clayey with rocks, slag and oily materials 10-Rock 15-SANDY CLAY (CL) Medium stiff to stiff, orange-brown 20-16 1 25 100 2350 Grading to grey-brown 25sandy clay (CL) 2 21 19 110 4780 30 34 3 23 101 Project No. 1084B Figure A-13 Geomatrix Consultants

Project: B	AY CENTER PROJECT Emeryville, California	Log	of	Boring	No	. 7	ontinued)
Samples Blows/Ft.	MATERIAL DI	ESCRIPTI	ON	į	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
35-4	SILTY CLAY (CL) Stiff, dark grey, with  SILTY SAND (SP-SM) Very dense, grey-brown	some sand			19	110	260
5 36	SANDY CLAY (CL) Stiff, dark grey			-	18	113	780
6 34	SILTY CLAY (CL)		<del>-</del>	-	24	101	6340
7 43	Very stiff, dark grey  Becoming sandy clay			-  -   -	18	111	5760
8 30	SILTY CLAY (CL)  Very stiff, orange-brown  Grading to grey silty  Bottom of Bori	clay		-	35	87	4610
65—   Project No. 1084B	Geomatrix C	onsultar	nts		Fiç	ure A	-14

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	8	
Date Drilled:	9/17/85	Remarks:						
Type of Boring:	L11 6 .							
Hammer Weight	: 140 and 280 lbs.	(See Lagend	Sheet	for sampler #y	pes	and h	ammer	weights)
Samples Blows/Ft	MATERIAL D	ESCRIPTIO	N			Moisture Content,% B	Density, pcf	Unconfined Compressive m Strength, 120 psf
ă s a						Moi	Ory C	Omp Omp Stre
<u> </u>	Surface Elevation: 13±	·		<del></del>	ı - İ	3	٥	- 0
	4" Asphalt Surfacing CLAYEY SAND FILL Medium dense, brown, w	vith gravel						
5-	CLAYEY SAND FILL Loose, brown, with con (concrete, bricks, roc		lebris	S	1 1 1			
	Becoming black and o	i ly			1 1			
10-13	SILTY CLAY FILL Soft, dark grey (less debris)				1 1 1	28	95	
15 - 2 18	SILTY SAND (SP-SM) Loose, dark grey, with	some shell:	s		1 1 1			
20-3 34	SILTY SAND (SP-SM)  Medium dense to dense,	orange-bro	wn		1 1	19	113	
25-4 24	Medium stiff, orange-l	brown,				18	112	2240
30- 5 101 Project No. 1084	<u> </u>	Consult	ant		  -  -	 Fi	 gure A	 15

Pro	j e c	t :	;	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	8 (co	ntinued }
Depth, Ft.	Samples		Blows/Ft.	MATERIAL D	ESCRIPTI	ON	į	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
35— -	6	Z	59 6''*	SILTY SAND (SP-SM)  Very dense, orange-brow	۷N			 		
40— -	7	Z	57	SILTY SAND (SP-SM) Very dense, dark grey			-			
45—	8	Z	49*	SANDY CLAY (CL)  Very stiff, dark grey			- -	22	105	7270
50	9		32*	☐ Grading to clayey san ☐ Increasing gravel con				16	115	1480
55— -			ļ	SANDY CLAY (CL)  Very stiff, orange-brow	/n					
60-	10	Z	46*	SILTY CLAY (CL) Stiff, gray-brown	CL)		-	31	90	2110
65— Proj.	. No			Geomatrix C	Consulta	ınts		Fig	jure A	-16

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		(Co	ntinued)
Depth, Ft. Samples Blows <sub>/Ft</sub>			ON	Ļ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
70-11 56*	Becoming plastic silty clay (CH)	tent			21	105	6640
80 12 81.	GRAVELLY SAND (SW)  Very dense, orange-bro gravel to l'' diam.	wn, with					
90 - 13 72*	SILTY CLAY (CL)  Very stiff, light grey  Grading to grey-brow				23	101	<del>-</del> 4730
100 14 34 6'''  Project No. 1084			<del></del>	- S		I 01 ure A	7570 <b>-17</b>

Project:	BAY CENTER PROJECT Emeryville, California	Log o	f Boring	No.	. 9	
Date Drilled:	9/13/85	Remarks:				
Type of Boring:	11.0 11					
Hammer Weight:	140 165.	(See Legend Sh	eet for sampler typ			
Samples Blows/Ft.	MATERIAL D	ESCRIPTION		Moisture Content, %	Density, pcf	Unconfined A Strength, Str
	Surface Elevation: 13±			_ ≅ ເ	Dry	5 ర్ర్
5—	10" Asphalt Surfacing CLAYEY SAND FILL Medium dense, grey  CLAYEY FILL Medium stiff, green-grey with organic material adebris					
10-	SILTY SAND FILL Loose, grey to black, wood and rock fragments		-			
15-1 14	SILTY CLAY FILL Soft, black, with orga wood and glass (oily)	nic material,	-	] - - - ;		
-	SILTY SAND (SM-SP) Loose, black, with shel	lls		- - -		
20 2 19	CLAYEY SAND (SC)  Medium dense, orange-br some gravel to 1/4" dia	am.		21	106	990
3 30	Grading to silty sand	d (SP-SM)	<del>-</del>	19	110	
30 4 24 Project No. 1084E	SILTY CLAY (CL-CH) Stiff, dark grey	( Consulta:		37	82 Jure A	3030

Project:	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	<b>9</b> (co	ntinued)
Samples Blows/Ft.	MATERIAL D	ESCRIPTI	ON	ţ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
	SILTY CLAY (CL-CH) Stiff, dark grey				-		
35 _ 5 28	SILTY SAND (SP-SM) Dense, brown to grey  Stiff, silty clay (CI	сн)					***
40-	, 50,77, 57,70, 6,0,						
6 44	SANDY CLAY (CL) Very stiff, dark grey				1		
45 - 7 44	SILTY CLAY (CL)  Very stiff, grey-brown				- - - 18	111	6090
50 8 25					29	93	3860
55	SILTY CLAY (CL) Stiff, grey		•			:	
9 17	Bottom of Bori	ng at 60'			39	81	3420
65— Project No. 1084	B Geomatrix				-	gure A	\_19

Project:	BAY CENTER PROJECT		D	AI.	4/	
	Emeryville, California	Log or	Boring	NO.	. 1	J
Date Drilled:	1	Remarks:				
Type of Boring:						
Hammer Weight:	140 IDS.	(See Legend Sheet	for sampler type			
iles Fr.	<u>.</u>				~	RY TESTS
Samples Blows/Ft	MATERIAL I	DESCRIPTION		1 5 t	Density, pcf	ssiv,
S. Ser				Moisture Content,%	ě	Unconfined Compressive Strength, psf
	Surface Elevation: 12±			⊼ຽ	Dr.y	588
<u> </u>	5" Concrete Slab			T		
]	FILL Medium dense, clayey o	1		1		
<b>!</b>	riculum dense, chayey	ravei —————		-		
	CLAYEY SAND FILL		į.	-		
<b>!</b> -	Loose, dark brown, with	th .	[ .	4		
5	organic materials and	misc. debris	-	]		
	(wood, bricks, glass,	etc.)				•
			'	1		
1 1				1		
				1		
-	CLAYEY FILL			-		
10-	Soft, black, with orga	anic material	_			
	and debris					
			'			
	T Rock fragments (slag	?)	-	-		
	₩		1.	1		
			-			
15—	SILTY CLAY (CH)	· · · · · · · · · · · · · · · · · · ·				
- 1 Push	, ,					
	SANDY CLAY (CL)			1		
	Stiff, orange-brown, w	ith some gravel	-	1		
	Tincreasing gravel con	tent	-			
20-	<u> </u>					
2 20	SILTY CLAY (CL-CH)		-	23	101	4880
	Stiff, orange-brown		_			
	TBecoming very stiff		.   -	]		
1	₩		-	1		
25			-			
3 52						
4 17 1	SILTY SAND (SP-SM)		_			
_	Very dense, orange-bro	พก				
			-			
	SILTY CLAY (CL-CH)	<del></del>	-			
30 4 23	Stiff, grey		-	27	97	4590
- 1	<u> </u>		-			
Project No. 1084B	Geomatrix	Consultants		Fig	ure A	-20

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	Pro	jec	t :	E	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	(Co	ntinued)
	Depth, Ft.	Samples		Blows/Ft.	MATERIAL D	ESCRIPTI	ION	ţ	Moisture Content, %	Ory Density, pcf	Unconfined Compressive Strength, psf
	- - 35— -	5	Z	105	SILTY CLAY (CL-CH) Stiff, grey  SILTY SAND (SP-SM) Very dense, grey-brown						
-	40	6		110	SILTY CLAY (CL-CH) Stiff, grey  SILTY SAND (SP-SM) Very dense, dark grey			-			
	45 - - -	7	Z	18	SANDY CLAY (CL) Stiff, dark grey			- - -	23	102	2020
	50— - - -	8		66	and very stiff  Bottom of Bor	ing at 51	1 1 1 2 1	 - - - -	17	101	7490
	55							- - -			
	65—	oct N		1084B	Geomatrix	Consult	ante		Fi	gure A	-21

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Project	t: ;	BAY CENTER PROJECT Emeryville, California	Log	of	Boring		No.	11	
Date Drill	ed:	9/10/85 and 9/12/85	Remarks:_		·				
Type of Bo		4" Rotary							<del></del>
Hammer W	/eight:	140 lbs.	(See Legend	Sheet 1	for sampler ty	pes			
Depth, Ft. Samples	Blows/F1.	MATERIAL D	ESCRIPTIO	ON			Moisture Content, %	Ory Density, by port	Unconfined Compressive H Strength, H
	<del></del>	Surface Elevation: 11生				$\perp$	_ <u>0</u>	٥	20
5-			ium dense, k fragment misc. deb c.)	s to 2					
15-	2	SILTY CLAY (CL-CH) Soft, dark grey, with	some shell	s		1 1 1 1 1	44	76	•
20-	25	SANDY CLAY (CL) Stiff, orange-brown, w gravel	ith some				22	105	6330
25-	38	SILTY SAND (SP-SM) Dense, brown				1 1 1			*
30- Project No	25	Stiff, grey, silty clay (CL-CH)  Geometri		<b>.</b>			27	95 gure A	3330

Proje	ct	•	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No	), <b>1</b>	ontinued)
Depth, Ft.	Samples	Blows/Ft.	MATERIAL DE	ESCRIPTI	ON	ķ	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength,
35-	5	26	SILTY SAND (SP-SM) Dense, brown SILTY CLAY (CL)				28	94	
	6	<b>3</b> 9	Stiff, dark grey				26	97	2550
	7	30	GRAVELLY SAND Dense, grey-brown  SANDY CLAY (CL-CH) Stiff to very stiff, gre	·y			23	102	2380
45-	3 2	25	SILTY CLAY (CH)  Very stiff, grey, with s		:1	-	27	96	5470
50-	Z	46	Becoming brown			-	No.	Recov	Perv
55			Becoming blue-gray			-	- No		
60	Ì	39	SILTY SAND (SM-SP)  Dense, blue-grey, with a  of stiff silty clay	lternatin	g stra	ta	<b> </b>		•
65 <b>—</b>			SANDY CLAY (CL)  Very stiff, brown mottle	d with gr	ey		21	105	5610
Project N	No. 1	084B	Geomatrix C	onsulta	nts		Fi	gure A	-23

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Project:		AY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	1 1 (co	ntinued)
Depth, Ft.	DIOWS/F1.	MATERIAL DI	ESCRIPTI	ON	<b>.</b>	Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
-		SANDY CLAY (CL) Very stiff, brown mott	led with g	ırey		_		<u> </u>
70-112 4	19 —	GRAVELLY SAND (SW) Dense, orange-brown			-	- - - - -		
13 5	55	GRAVELLY CLAY Very stiff, orange-brow	٧n		-	14	119	3700
14 3	2	SILTY CLAY (CL)  Very stiff, light grey  Becoming sandy clay			-	21	105	7220
15 4	6	CLAYEY SAND (SC)				21	104	7760
90-16	3	Dense, orange-brown, wi some gravel to 3/4"  SANDY CLAY Very stiff, orange-brow			-	15	117	4280
17 90	0				- -	17	113	7180
18 8	4	GRAVELLY SAND (SP)  Very dense, orange-brow gravel to 1½" diam.  Bottom of Bo		9½'		16	111	2960
Project No. 108	Project No. 1084B Geomatrix Consultants					Fi	gure A	-24

Project:	BAY CENTER PROJECT Emeryville, California	Log of	Boring	No.	12	
Date Drilled:_	9/19/85	Remarks:				
Type of Boring	6" Auger					
		_ (See Legend Sheet	for sampler gypes			weights)
Samples Blows/Ft	MATERIAL	DESCRIPTION		Moisture Content,%	Density, pcf	Unconfined Compressive Strength,
	Surface Elevation: 14±			≥ိပိ	Dry	58°
5	2" Asphalt Surfacing, SANDY GRAVEL FILL Grey with some cobble SILTY CLAY FILL Dark grey, with sand and some bricks  Bottom of Bo	es and gravel				
15—			- - - - - -			
20-						
25—			- - -			
Project No. 1084	4B Geomatri	ix Consultants	,	Fig	jure A	-25

Project:	BAY CENTER PROJECT Emeryville, California	Log of Boring	No.	13	
Date Drilled:_	9/19/85 6" Auger	Remarks:			
Type of Boring:	- Auger				
Hammer Weight	<u> </u>	(See Legend Sheet for sampler type			weights) Y TESTS
Samples Blows/Ft.	MATERIAL	DESCRIPTION	Moisture Content,%	Dry Density,	Unconfined Compressive Strength,
	Surface Elevation: 12±		_ ≥ ຽ	ă	ភិទ្ធិហ
	2" Asphalt Surfacing, 4	'' Aggregate Base		.	
	SILTY CLAY FILL Brown, with gravel		]		
	SILTY CLAY FILL Dark grey, with wood, and wire	metal, bricks,	_		
5-			-		
	Bottom of Bo	ring at 5'	1		
			-		
10-		-	1		
			]		
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Project No. 108	48 Geometr	ix Consultants	Fi	gure A	-26

<u> </u>	jec	71.	BAY CENTER PROJECT Emeryville, California	Log	of	Boring	No.	14
			9/19/85	Remarks:		<del></del>	71.	
			6" Auger					
Hamr	mer V	Veight		(See Legen	d Sheet	for sampler type	s and h	ammer weights
ıΞ	e	<u>;</u>						RATORY TEST
Depth,	Samples	* * *	MATERIAL D	FSCRIPT	IONI		-%	
<b>1</b> 8	S	Blows/Ft.		, EOO! (! .	IOIA		pri.	Density, pcf confined pressive rength,
<b> </b>	L,		Surface Elevation: 12±	<del></del>		<u>-</u>	Moisture Content,%	Dry Density, pcf Unconfined Compressive Strength,
	T	T	2" Asphalt Surfacing, 4"	A = = = -		<del></del> -	1-2	<u> 5                                   </u>
-			SANDY GRAVEL FILL	Aggregate	Base		]	1
			Grey, with some cobble	5			]	1
i i			SILTY CLAY FILL		<del></del>		1 1	
1 7			Grey, with sand and gr	ave i		-	<b> </b>	
1 1			SILTY CLAY FILL	9461				
5-			Dark grey, with bricks	1000d ma	ماء م		]	
		1 1	metal, and wire	, wood, ro	CKS,	/	1 1	
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1 1	ļ		Bottom of Bori	ing at 5'		-		
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Project No. 1084B Geometrix Consultants Figure A 27								
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## WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: GETTY SYNTHETIC FUELS, INC.

SAMPLE: A2502

NALYSIS TYPE: GAS PHASE VOLATILE COMPOUNDS

## ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED:

09/19/86

GCMS FILENAME:

4104G1

LEVEL:

LOW

MATRIX:

GAS

DATE PREPARED:

10/02/86

DATE ANALYZED:

10/02/86

STANDARD ID:

GAS134,137

INSTRUMENT ID:

5100

SAMPLE AMOUNT: 1ML

DETECTION

	CAS #	COMPOUND		(V/V)	LIMIT
!	74-87-3	CHLOROMETHANE	 = ====		100.
	74-87-3 74-83-9	BROMOMETHANE		ND ND	100.
	75-01-4	VINYL CHLORIDE	4.	20.	100.
	75-01-4 75-00-3	CHLORGETHANE	1 5	2U. ND	100.
	75-00-3 75-09-2	METHYLENE CHLORIDE		ND D	100.
	67-64-1	ACETONE		ND ND	100.
	-				
	107-02-8	ACROLEIN		ND	100.
	107-13-1	ACRYLONITRILE		ND	100.
	75-15-0	CARBON DISULFIDE		ND	100.
	75-35-4	1,1-DICHLOROETHENE		ND	100.
	75-34-3	1,1-DICHLORDETHANE		ND	100.
	156-60-5	TRANS-1, 2-DICHLOROETHENE		ND	100.
	540-59-0	CIS-1,2-DICHLOROETHYLENE		ND	100.
₹	09-99-9	TETRAHYDROFURAN		ND	100.
	75-71-8	DICHLORODIFLUOROMETHANE		ND	100.
	75-69-4	TRICHLOROFLUOROMETHANE		ND	100.
	76-13-1	FREON-TF		ND	100.
	106-93-4	ETHYLENE DIBROMIDE		ND	100.
	123-91-1	1,4-DIDXANE		ND	100.
	96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	100.
	67-66-3	CHLOROFORM		ND	100.
	107-66-2	1,2-DICHLOROETHANE		ND	100.
	78-93-3	2-BUTANONE		ND	100.
	71-55-6	1,1,1-TRICHLOROETHANE		ND	100.
	16-23-5	CARBON TETRACHLORIDE		ND	100.
	108-05-4	VINYL ACETATE		ND	100.
	75-27-4	BROMODICHLOROMETHANE		ND	100.
	79-34-5	1, 1, 2, 2-TETRACHLOROETHANE		ND	100.
	78-87-5	1,2-DICHLOROPROPANE		ND	100.
	10061-02-6	TRANS-1, 3-DICHLOROPROPENE		ND	100.
	79-01-6	TRICHLOROETHENE		ND	100.
	124-48-1	CHLORODIBROMOMETHANE		ND	100.
	79-00-5	1, 1, 2-TRICHLORDETHANE		ND	100.
	71-43-2	BENZENE		ND	100.
	10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	100.
	110-75-8	2-CHLOROETHYLVINYL ETHER		ND	100.
	75-25-2	BROMOFORM		ND	100.
_	119-78-6	2-HEXANONE		ND	100.
	08-10-1	4-METHYL-2-PENTANONE		ND	100.
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DATA: 4104G1 #1861 CALI: 82586C1 #3 SCANS 170 TO 2100 RIC 10/02/86 17:44:00 SAMPLE: GETTY - A2502 1ML CONDS.: 30M X 0.32MM DB-1 1,2100 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3 RANGE: G 194560. 59.07 RIC 202 1000 9:10 1500 13:45 2000 18:20 500 4:35 SCAN TIME

# WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: GETTY SYNTHETIC FUELS, INC.

SAMPLE: A2502

NALYSIS TYPE: GAS PHASE VOLATILE COMPOUNDS

# ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED:

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GCMS FILENAME:

4104G1

LEVEL:

LOW

MATRIX:

GAS

DATE PREPARED:

10/02/86

DATE ANALYZED:

10/02/86

STANDARD ID:

GAS134, 137

INSTRUMENT ID:

5100

SAMPLE AMOUNT:

1ML

CONC. DDR (U/U)

DETECTION

i	CAS #	COMPOUND	CONC:	PPB	(V/V)	LIMIT	
	127-18-4	TETRACHLORDETHENE			ND	100.	
	108-88-3	TOLUENE			ND	100.	
	108-90-7	CHLOROBENZENE			ND	100.	
	100-41-4	ETHYLBENZENE			ND	100.	
	100-42-5	STYRENE			ND	100.	
	95-47-6	TOTAL XYLENES			ND	100.	
	108-41-8	M-CHLOROTOLUENE			ND	100.	
	541-73-1	1,3-DICHLOROBENZENE			ND	100.	
	106-46-7	1,4-DICHLOROBENZENE			ND	100.	
	95-50-1	1,2-DICHLOROBENZENE			ND	100.	
	91-20-3	NAPHTHALENE			ND	100.	