

## **APPENDIX G**

### **Methane Survey Report**





**METHANE SURVEY REPORT  
LA BREA TAR PITS SITE MASTER PLAN  
5801 WILSHIRE BOULEVARD  
LOS ANGELES, CALIFORNIA**

**Prepared For:** LOS ANGELES COUNTY MUSEUM OF NATURAL  
HISTORY FOUNDATION  
900 EXPOSITION BOULEVARD  
LOS ANGELES, CALIFORNIA 90007

**Prepared By:** LEIGHTON CONSULTING, INC.  
17781 COWAN  
IRVINE, CALIFORNIA 92614

Project No. 10890.004

January 12, 2023

---



Leighton Consulting, Inc.

A Leighton Group Company

January 12, 2023

Project No. 10890.004

Los Angeles County Museum of Natural History Foundation  
900 Exposition Boulevard  
Los Angeles, California 90007

Attention: Ms. Dawn McDivitt, Chief Deputy Director

**Subject: Methane Survey Report La Brea Tar Pits Master Plan  
5801 Wilshire Boulevard, Los Angeles, California**

References: Los Angeles Department of Building and Safety, 2020, Site Testing Standards for Methane, Document No. P/BC 2020-101, dated January 1, 2020.

## **INTRODUCTION**

Leighton Consulting, Inc. (Leighton) is pleased to present this Methane Survey Report for the proposed La Brea Tar Pits Master Plan project located at 5801 Wilshire Boulevard, Los Angeles, California (Site – Figure 1).

Although the property is located within the boundary of the City of Los Angeles, the property is owned by the County and is governed by County codes and regulations. The County of Los Angeles requires that a methane survey be conducted prior to issuance of permits for new buildings or enclosed structures, additions, or conversions of a building or structure to habitable or occupiable at the Site in accordance with Sections 110.3, 110.4, and 110.5 of Title 26 of the Los Angeles County Code. Los Angeles County does not have a specific set of requirements for methane testing protocols to determine the necessary level of mitigation; therefore, they rely upon Site Testing Standards for Methane described in the City of Los Angeles Department of Building and Safety (LADBS) January 1, 2020 Information Bulletin Public – Building Code (IB/P/BC) 2020-101 to assess methane conditions at the Site.

---

## **SITE DESCRIPTION AND PROJECT INFORMATION**

The La Brea Tar Pits property (Site) is located at 5801 Wilshire Boulevard within the 23-acre Hancock Park (Assessor's Parcel Number 550-801-6902). The Site includes 13 acres of the eastern and northwestern portions of Hancock Park and is directly adjacent to the Los Angeles County Museum of Art (LACMA); both LACMA and the Foundation are responsible for managing separate and distinct portions of the 23-acre Hancock Park, with the Foundation responsible for the 13-acre project Site and LACMA responsible for the remainder of Hancock Park to the west of the Site boundaries. LACMA's facilities are not included in this project.

It is our understanding that the proposed La Brea Tar Pits Master Plan will consist of the renovation of the existing George C. Page Museum which is approximately 63,200 square feet (sf) in size, construction of a new two-story 40,000 sf museum building northwest of the George C. Page Museum, and other renovations and upgrades to the Lake Pit, the entrance to the property at Wilshire Boulevard and South Curson Avenue, the entrance at West 6<sup>th</sup> Street, the tar pits (Pits 3, 4, 9, 13, 61, 67, and 91, and Project 23), pedestrian paths and recreation areas, parking, and landscaping.

The existing George C. Page Museum building was constructed with a methane mitigation system beneath the foundation that has been tested on a regular basis. Methane has been detected at concentrations exceeding 50,000 parts per million by volume (ppmv) in previous monitoring events. It is anticipated that any renovations to this museum structure will keep the existing mitigation system intact.

The property on which the existing and planned museum buildings are located is 13 acres. The area of investigation required of very large properties, such as this one, may be calculated as the area of the proposed building footprint plus the area within 100 feet of the building perimeter. In this case, we assume the construction area of the new two-story 40,000 sf museum building, plus 100 feet around the perimeter, totaling approximately 160,000 sf, to be the project area requiring investigation.

LADBS Site Testing Standards for Methane require a minimum of two shallow soil gas probes per project area, set at a depth of at least 4 feet below ground surface or at a rate of one probe per 10,000 sf of project area. Additionally, deeper soil gas probe sets are required to be installed at a rate of one set per 20,000 sf of project area with the probes set at 5, 10, and 20 feet below the deepest slab/foundation or a minimum of 12 inches above the ground water table.

---

While the exact depth of construction and the finish grade of the new museum building has not been established, the depth of excavation may extend to approximately 6 to 10 feet below ground surface (bgs). Since shallow groundwater and asphalt sands have been encountered at the Site at a depth of approximately 6 feet bgs, only 16 shallow probes were installed at depths of 5 feet bgs or shallower during this investigation.

## **OBJECTIVE**

The objective of our methane assessment was to evaluate the concentrations of methane in subsurface soil gas at the Site to determine necessary mitigation requirements for the proposed new construction.

## **SUMMARY OF WORK COMPLETED**

### **Soil Gas Probe Installation**

Leighton engaged Millennium Environmental, Inc. to install soil gas probes in 16 borings (MB-1 to MB-16) using direct push drilling equipment (Figure 1).

Soil gas probes were placed at depths between 4 and 5 feet bgs in each soil boring location. Due to shallow groundwater encountered between 6 and 8 feet bgs in previous investigations and the presence of asphalt sands and clays deeper probes were not able to be installed. The soil gas probes consisted of inert ¼-inch nylaflo tubing fitted with a porous airstone at the terminus, which were set within one foot of sand, one foot of dry bentonite above, followed by hydrated bentonite to six inches below the ground surface. The surface end of the probe was fitted with a gas-tight leurlock to prevent infiltration of water or air. Soil gas probes were allowed to equilibrate for a minimum of 2 hours prior to sampling.

Soil gas sampling points were abandoned upon completion of the second soil gas sampling event. Probe abandonment consisted of pulling the tubing from the ground or cutting the tubing as deep as possible from each location if the tubing could not be removed. Each location was sealed with hydrated bentonite and the surface was restored to its original condition.

Boring locations were accurately measured to a fixed reference point, noted on field maps, and surveyed using a Trimble Geo7X Mobile Global Positioning System (GPS) unit.

---

## **Soil Gas Probe Sampling**

Soil gas samples collected from the probes were tested on October 18 and 19, 2022. The soil gas samples were analyzed in the field utilizing an RKI Eagle (Landtec equivalent) with a methane detection limit of 5 ppmv. Soil gas pressure readings were obtained from each soil gas probe using a magnahelic gauge capable of measuring 0.01 inches of water prior to testing. Barometric pressure readings were noted prior to sampling the probes and were observed to be steady during the sampling events.

## **RESULTS**

Methane was detected at concentrations ranging from 5 ppmv to 49,000 ppmv in soil gas samples collected on October 18, 2022. Methane was detected at concentrations ranging from 15 ppmv to 50,000 ppmv in soil gas samples collected on October 19, 2022. Soil gas samples were not collected from five locations (MB-3, MD-4, MB-6, MB-11, and MB-12) due to no flow conditions encountered within clay units.

Pressure readings from the individual soil probes were measured at 0.0 inches of water, indicating that there was no significant soil gas pressure observed during this investigation.

A completed Certificate of Compliance for Methane Test Data (Form 1, Part 1) has been stamped by a Registered State of California Professional Geologist and is attached at the end of this report. A table showing the test results is included in the Certificate of Compliance for Methane Test Data (Form 1, Part 2).

## **CONCLUSIONS AND RECOMMENDATIONS**

Methane was detected in soil gas at a maximum concentration of 50,000 ppmv during this methane survey. No measureable soil gas pressures above 0.1 inches of water were detected.

Based on the results of our methane survey, the Site would be classified as Site Design Level V. Sites within Site Design Level V are required to install an active mitigation system. The active mitigation system should include features such as an impervious membrane, a sub-slab venting system (including pressure sensors below the impervious membrane and a mechanical extraction system), a gas detection system, and an alarm system. Other miscellaneous items that should be installed include trench dams, conduit or cable seal fittings, and additional vent risers. De-watering may be required based on the depth of final construction which has not yet been determined.

---

It should be noted that if planned construction activities do impact the existing methane mitigation system beneath the current George C. Page Museum, the repair mitigation system will meet Site Design Level V active mitigation requirements.

This report should be submitted to Los Angeles County Department of Building and Safety with your development plans that include the appropriate mitigation for review and approval.

**CLOSING**

If you have any questions regarding this report, please do not hesitate to contact this office. The undersigned can be reached by phone at (949) 681-4287.



Respectfully submitted,  
LEIGHTON CONSULTING, INC.

Brynn McCulloch, PG 8798  
Principal Geologist


Attachments: Figure 1 – Site Plan  
Form 1 – Certificate of Compliance for Methane Test Data  
Table 1A – Mitigation Requirements for Methane Zone


Distribution: (1) Addressee






**LEGEND**

 Approximate Proposed Museum Area

 MB-16 Approximate Soil Boring Location



**SITE PLAN**

The La Brea Tar Pits Master Plan  
 New Museum Building  
 5801 Wilshire Boulevard  
 Los Angeles, California

Project No.	<u>10890.004</u>	
Scale	<u>NTS</u>	
Engr./Geol.	<u>BFM</u>	
Drafted By	<u>BFM</u>	
Date	<u>January 2023</u>	Leighton Figure 1

**FORM 1 - CERTIFICATE OF COMPLIANCE FOR METHANE TEST DATA**

**Part 1: Certification Sheet**

Site Address: 5801 Wilshire Boulevard, Los Angeles, CA

Legal Description: Tract: \_\_\_\_\_ Lot: \_\_\_\_\_ Block: \_\_\_\_\_

Building Use: Proposed museum building Architect's, Engineer's or Geologist's Stamp:

Name of Architect, Engineer, or Geologist:  
Brynn McCulloch  
 Mailing Address:  
17781 Cowan, Irvine, CA 92614  
 Telephone: 949-681-4287  
 Name of Testing Laboratory:  
Leighton Consulting, Inc.  
 City Test Lab License #: TA 10069  
 Telephone: 949-250-1421



I hereby certify that I have tested the above site for the purpose of methane mitigation and that all procedures were conducted by a City of Los Angeles licensed testing agency in conformity with the requirements of the LADBS Information Bulletin P/BC 2020-101. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the architect, engineer or geologist whose signature is affixed thereon.

Signed: [Signature] date 11/15/2022

Required Data:

- Project is in the (Methane Zone) or (Methane Buffer Zone).
- Depth of ground water observed during testing: 6 feet below the Impervious Membrane.
- Depth of Historical High Ground Water Table Elevation\*: 6 feet below the Impervious Membrane.
- Design Methane Concentration\*\*: 50,000 parts per million in volume (ppmv).
- Design Methane Pressure\*\*\*: 0.0 inches of water column.
- Site Design Level: (Level I, Level II, Level III, Level IV, Level V) with <2 inches of water column.

De-watering:

- De-watering ( is ) ( is not ) required per Section 7104.3.7.
- Pump discharge rate \_\_\_\_\_ cubic feet per minute per reference geology or soil report: \_\_\_\_\_ dated \_\_\_\_\_.

Additional Investigation:

- Additional investigation ( was ) ( was not ) conducted. See report.

Latest Grading on Site:

- Date of last grading on site ( was ) ( was not ) more than 30 days before Site Testing.
- See report for explanation of the effect on soil gas survey results by grading operations.

Notes:

\* Historical High Ground Water Table Elevation shall mean the highest recorded elevation of ground water table based on historical records and field investigations as determined by the engineer for the methane mitigation system.

\*\* Design Methane Concentration shall mean the highest recorded measured methane concentration from either Shallow Soil Gas Test or any Gas Probe Set on the site.

\*\*\* Design Methane Pressure shall mean the highest total pressure measured from any Gas Probe Set on the site.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.

## FORM 1 (CONTINUED) - CERTIFICATE OF COMPLIANCE FOR METHANE TEST DATA

### Part 2: Test Data - Shallow Soil Gas Test and Gas Probe Test

Site Address: 5801 Wilshire Boulevard, Los Angeles, CA

Description of Gas Analysis Instrument(s):

Instrument Name and Model: RKI Eagle

Instrument Accuracy: 5 ppmv.

City of Los Angeles Testing License #: TA 10069

Date	Time	Probe Set #	Concentration (ppmv)	Pressure (inches water column)	Probe Depth (feet bgs)	Description / Probe Location
10/18/2022	0719	MB-1	90	0.00	5	Parking lot NW
10/18/2022	0725	MB-2	65	0.00	4.5	Parking lot NW
10/18/2022	0733	MB-3	No flow	0.00	5	Parking lot SW
10/18/2022	0737	MB-4	No flow	0.00	5	Parking Lot SW
10/18/2022	0742	MB-5	4,875	0.00	4	Parking lot NE
10/18/2022	0750	MB-6	No flow	0.00	5	Parking lot SE
10/18/2022	0757	MB-7	49,000	0.00	5	Parking lot SE
10/18/2022	0800	MB-8	15	0.00	4	Parking lot NE
10/18/2022	0806	MB-9	95	0.00	5	Grassy area NE
10/18/2022	0816	MB-10	5	0.00	5	Grassy area NE
10/18/2022	0820	MB-11	No flow	0.00	5	Grassy area NW
10/18/2022	0833	MB-12	No flow	0.00	4	Grassy area NW
10/18/2022	0840	MB-13	5,000	0.00	4	Grassy area SW
10/18/2022	0844	MB-14	420	0.00	4.5	Grassy area SW
10/18/2022	0850	MB-15	250	0.00	4	Grassy area SE
10/18/2022	0903	MB-16	300	0.00	4	Grassy area SE
10/19/2022	0720	MB-1	85	0.00	5	Parking lot NW
10/19/2022	0730	MB-2	70	0.00	4.5	Parking lot NW
10/19/2022	0735	MB-3	No flow	0.00	5	Parking lot SW
10/19/2022	0740	MB-4	No flow	0.00	5	Parking Lot SW
10/19/2022	0750	MB-5	5,050	0.00	4	Parking lot NE
10/19/2022	0755	MB-6	No flow	0.00	5	Parking lot SE
10/19/2022	0803	MB-7	50,000	0.00	5	Parking lot SE
10/19/2022	0810	MB-8	25	0.00	4	Parking lot NE

### TABLE 1 - DATA COLLECTION EQUIPMENT

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.



**TABLE 1A. MITIGATION REQUIREMENTS FOR METHANE ZONE\***

Site Design Level		LEVEL I		LEVEL II		LEVEL III		LEVEL IV		LEVEL V	
Design Methane Concentration (ppmv)		0-100		101-1,000		1,001-5,000		5,001-12,500		>12,500	
Design Methane Pressure (inches of water pressure)		≤2	>2	≤2	>2	≤2	>2	≤2	>2	All Pressures	
PASSIVE SYSTEM	De-watering System <sup>1</sup>		X	X	X	X	X	X	X	X	
	Sub-Slab Vent System	Perforated Horizontal Pipes	X	X	X	X	X	X	X	X	X
		Gravel Blanket Thickness Under Impervious Membrane	2"	2"	2"	3"	2"	3"	2"	4"	4"
		Gravel Thickness Surrounding Perforated Horizontal Pipes	2"	2"	2"	3"	2"	3"	2"	4"	4"
		Vent Risers	X	X	X	X	X	X	X	X	X
	Impervious Membrane		X	X	X	X	X	X	X	X	X
ACTIVE SYSTEM	Sub-Slab System	Pressure Sensors Below Impervious Membrane							X	X	
		Mechanical Extraction System <sup>2</sup>							X	X	
	Lowest Occupied Space System	Gas Detection System <sup>3</sup>		X		X	X	X	X	X	X
		Mechanical Ventilation <sup>3,4,5</sup>		X		X	X	X	X	X	X
		Alarm System		X		X	X	X	X	X	X
	Control Panel			X		X	X	X	X	X	X
MISC. SYSTEM	Trench Dam		X	X	X	X	X	X	X	X	
	Conduit or Cable Seal Fitting		X	X	X	X	X	X	X	X	
	Additional Vent Risers <sup>5</sup>										X

X = Indicates a Required Mitigation Component

\* Table 1A-Mitigation Requirements for Methane Zone and Table 1B-Mitigation Requirements for Methane Buffer Zone are based on Table 71 and Chapter 71 of the Los Angeles Building Code.

- De-watering is not required when the maximum Historical High Ground Water Table Elevation, or projected post-construction ground water level, is more than 12 inches below the bottom of the Perforated Horizontal Pipes.
- The Mechanical Extraction System shall be capable of providing an equivalent of a complete change of air every 20 minutes of the total volume of the Gravel Blanket.
- The mechanical ventilation system shall be capable of providing an equivalent of one complete change of the lowest occupied space every 15 minutes.
- Vent openings to comply with Item IV.B.4 on sheet 1 may be used in lieu of mechanical ventilation.
- The total quantity of installed Vent Risers shall be increased to double the rate for the Passive System.