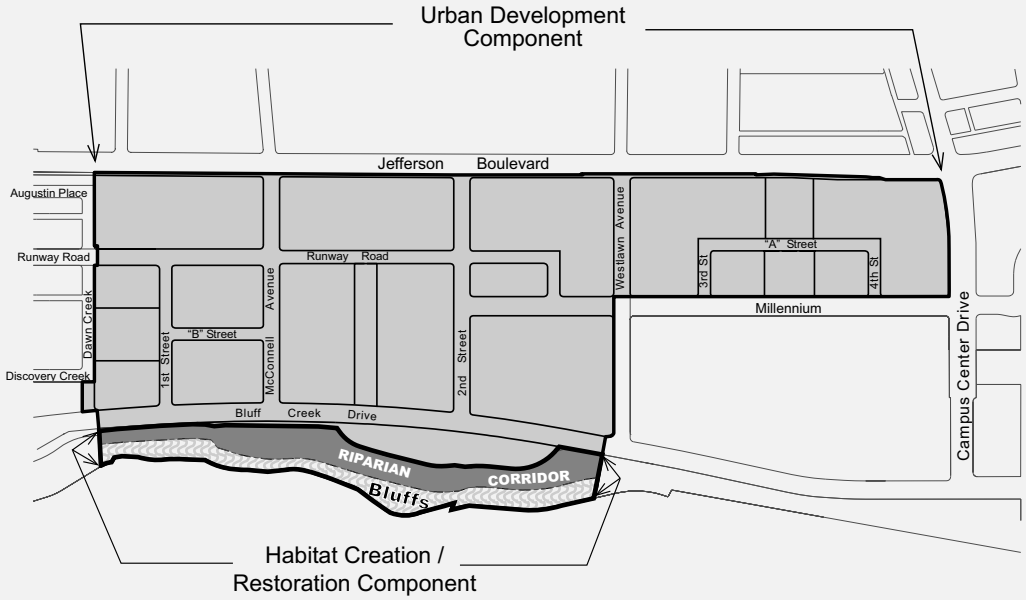
Draft Environmental Impact Report (DEIR)
Village at Playa Vista



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Technical Appendix J

J. Safety/Risk of Upset (Cont.)

City of Los Angeles/EIR No. ENV-2002-6129-EIR

2003

State Clearinghouse No. 2002111065

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APPENDIX J-4:
CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY, "MEMORANDUM OF GENERAL DISTRIBUTION #92: METHANE POTENTIAL HAZARD ZONES," MARCH 19, 1991

CITY OF LOS ANGELES
CALIFORNIA

2/11/92

DEPARTMENT OF BUILDING & SAFETY
CITY OF LOS ANGELES

MEMORANDUM OF GENERAL DISTRIBUTION #92
March 19, 1991

SUBJECT: METHANE POTENTIAL HAZARD ZONES

PURPOSE

The purpose of this Memorandum of General Distribution is to establish minimum standards and procedures for natural methane gas detection and control in areas designated as High Potential and Potential Methane Zones and in other areas where natural methane gas is determined to be potentially hazardous. This MGD is intended to be used in conjunction with Chapter 15 of the Building Code. The standards contained herein are intended to assist homeowners, building designers and contractors involved in smaller projects where detection, ventilation, and methane barrier requirements apply. These guidelines represent general conditions and should not be construed to substitute for the design expertise of a Qualified Engineer (gas control specialist) on matters relating to a specific site or within areas where natural methane gas has been detected.

DEFINITIONS

LQWER EXPLOSIVE LIMIT: The "lower explosive limit" (L.E.L.) is the lower limit of flammability of an explosive gas or vapor at ordinary temperatures and atmospheric pressure and expressed in percent by volume.

I. METHANE CONTROL SYSTEMS - WHERE REQUIRED AND TYPE OF SYSTEM TO BE USED

A. Existing Construction
See Table 1

B. New construction
See Tables 2 and 3

TABLE 1
METHANE CONTROL SYSTEMS
EXISTING CONSTRUCTION

TYPE OF STRUCTURE	HIGH POTENTIAL METHANE ZONE		POTENTIAL METHANE ZONE	
	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnotes 1 & 2)	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnotes 1 & 2)
Commercial, Industrial, and Institutional Buildings	1. Ventilation system activated by a gas detection system. *	Mechanical Electrical Fire Dept. Plumbing	1a. Gas detection system or 1b. Ventilation system	Mechanical Electrical Fire Dept. Plumbing
	2. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building		2. Paved area vent system. Paved areas over 5,000 sq. ft., and within 15 feet of the exterior wall of the building when methane is detected on the site	
	3. Qualified Engineer to design system in all commercial, industrial, and institutional buildings *	Grading Division to review and approve system design report	3. Qualified Engineer. Not required	
	4. Emergency procedures required for all commercial, industrial, and institutional buildings	Fire Dept. approval	4. Emergency procedures for buildings with a methane detection system or ventilation system	Fire Dept. approval
Multiple Residential Buildings	1a. Gas detection system or 1b. Ventilation system	Mechanical Electrical Fire Dept. Plumbing	1a. Gas detection system or 1b. Ventilation system	Mechanical Electrical Fire Dept. Plumbing
	2. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building		2. Paved area vent system. Paved areas over 5,000 sq. ft., and within 15 feet of the exterior wall of the building when methane is detected on the site	
	3. Emergency procedures for buildings with a methane detection system or ventilation system	Fire Dept. approval	3. Emergency procedures for buildings with a methane detection system or ventilation system	Fire Dept. approval
Single Family Dwellings with basement	1. Gas detection system	Electrical Fire Dept.	1. Gas detection system	Electrical Fire Dept.

1. Fire Department permits are to be obtained from the Engineering Unit, 9th Floor, City Hall East.
2. In addition to Mechanical, Electrical, Plumbing, and Fire Department Permits, a Building Permit is required for all work required by Chapter 15 of the L.A.B.C. except for single family dwellings.
* Pending change in Section 91.1504(a) of the L.A.B.C.

TABLE 2
METHANE CONTROL SYSTEMS
NEW CONSTRUCTION

TYPE OF STRUCTURE	HIGH POTENTIAL METHANE ZONE		POTENTIAL METHANE ZONE	
	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnotes 1 & 2)	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnotes 1 & 2)
Commercial, Industrial, and Institutional Buildings	1. Ventilation system activated by a gas detection system *	Mechanical Electrical Fire Dept.	1a. Gas detection system or 1b. Ventilation system	Electrical Mechanical Fire Dept.
	2. Membrane shield under the building	Building	2. Membrane shield under the building	Building
	3. Foundation vent system. Buildings over 50 feet in width	Plumbing Fire Dept.	3. Foundation vent system. Buildings over 50 feet in width when methane is detected on the site	Plumbing Fire Dept.
	4. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building	Plumbing	4. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building, when methane is detected on the site	Plumbing
	5. Qualified Engineer to design system in all commercial, industrial, and institutional buildings *	Grading Division to review and approve system design report	5. Qualified Engineer to design system in buildings covering over 50,000 sq. ft. of lot area or with more than one level of basement	Grading Division to review and approve system design report
	6. Emergency procedures required for all commercial, industrial, and institutional buildings	Fire Dept. approval	6. Emergency procedures for buildings with a methane detection system or ventilation system	Fire Dept. approval
Multiple Residential Buildings	1a. Gas detection system or 1b. Ventilation system	Electrical Mechanical Fire Dept.	1a. Gas detection system or 1b. Ventilation system	Electrical Mechanical Fire Dept.
	2. Membrane shield under the building	Building	2. Membrane shield under the building	Building
	3. Foundation vent system. Buildings over 50 feet in width	Plumbing Fire Dept.	3. Foundation vent system. Buildings over 50 feet in width when methane is detected on the site	Plumbing Fire Dept.
	4. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building	Plumbing	4. Paved area vent system. Paved areas over 5,000 sq. ft. and within 15 feet of the exterior wall of the building, when methane is detected on the site	Plumbing
	5. Qualified Engineer to design system in buildings covering over 50,000 sq. ft. of lot area or with more than one level of basement	Grading Division to review and approve system design report	5. Qualified Engineer to design system in buildings covering over 50,000 sq. ft. of lot area or with more than one level of basement	Grading Division to review and approve system design report
	6. Emergency procedures for buildings with a methane detection system or ventilation system.	Fire Dept. approval	6. Emergency procedures for buildings with a methane detection system or ventilation system	Fire Dept. approval

1. Fire Department permits are to be obtained from the Engineering Unit, 8th Floor, City Hall East.
2. In addition to Mechanical, Electrical, Plumbing, and Fire Department Permits, a Building Permit is required for all work required by Chapter 15 of the L.A.B.C. except for single family dwellings.
* Pending change in Section 91.1505(e) of the L.A.B.C.

TABLE 3
METHANE CONTROL SYSTEMS
NEW CONSTRUCTION

TYPE OF STRUCTURE	HIGH POTENTIAL METHANE ZONE		POTENTIAL METHANE ZONE	
	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnote 1 & 2)	REQUIRED SYSTEMS	PLANS AND PERMITS REQUIRED (See footnotes 1 & 2)
Single Family Dwelling or Duplex with concrete slab floor	1. Membrane shield under the building	Building	No requirements	
	2. Foundation vent system	Plumbing	No requirement	
Single Family Dwelling or Duplex with basement	1. Gas detection system	Electrical Fire Dept.	1. Gas detection system	Electrical Fire Dept.
Single Family Dwelling or Duplex with raised floor	No requirement		No requirement	
Swimming pool	Engineering geologic study	Grading Division	No requirement	

1. Fire Department permits are to be obtained from the Engineering Unit, 9th Floor, City Hall East.
2. In addition to Mechanical, Electrical, Plumbing, and Fire Department Permits, a Building Permit is required for all work required by Chapter 15 of the L.A.B.C. except for single family dwellings.

Any building located within both the High Potential Methane Zone and the Potential Methane Zone shall comply with the more restrictive provisions of the High Potential Methane Zone

II. METHANE CONTROL METHODS AND INSTALLATION - NEW AND EXISTING CONSTRUCTION

A. MECHANICAL VENTILATION SYSTEM

The mechanical ventilation system when activated, shall provide 100 percent outside make-up air and shall exhaust to the outside of the building. Electrical, mechanical, and fire permits are required prior to installation.

1. Ventilation Methods

Mechanical ventilation systems shall provide a minimum of four air changes per hour and shall be furnished by one of the following:

a. A permanently installed mechanical supply and exhaust system activated by a methane sensor, or

b. An air conditioning system with an economizer feature activated by a methane sensor which provides 100% intake and exhaust air, or

c. A permanently installed mechanical exhaust system operating continuously 24 hours a day, or

d. Other equivalent system approved by the Department.

2. Installation

Mechanical ventilation systems shall be designed and installed in conformance with the Mechanical Code and the following:

a. Intake and exhaust openings shall be distributed so as to assure a uniform movement of air over the entire room area where a mechanical ventilation system is installed.

b. Ducts used for conveying methane shall be made of materials in compliance with Section 1107(b) and shall be constructed in accordance with Section 1107(c) of the Uniform Mechanical Code.

c. Duct outlets shall terminate in accordance with Section 1107(j) of the Uniform Mechanical Code.

B. METHANE DETECTION SYSTEM

A methane detection system consists of methane detection sensors with or without control units, visual and/or audible alarm, and may include a control panel.

The system shall be approved by the Department of Building and Safety, Mechanical Bureau, and the Fire Department. Electrical, mechanical, and fire permits shall be obtained prior to installation.

The methane detection system shall be designed for safe operation in the electrical classification (hazardous or non-hazardous) specific to the area in which it is installed. In case of power failure the system shall automatically switch to battery power and activate a trouble light or an audible tone to alert the building owner or person designated as the safety director of the power failure. Batteries are to provide a minimum of 24 hours backup plus 5 minutes of alarm capability. In buildings required to have a standby power supply system, the methane detection system shall be connected to that system.

In addition to testing for electrical safety as required by the Los Angeles City Electrical Code, the equipment or system shall be tested and approved for performance by a recognized testing laboratory in accordance with Fire Department recognized standards.

The methane detection system shall provide continuous monitoring for potentially hazardous concentrations of flammable gas and shall meet the following conditions:

1. Methane Detection Sensors

Methane detection sensors shall be capable of detecting up to at least 100 percent of the L.E.L. on a continuous basis and shall be capable of performing the following:

a. In buildings with a mechanical ventilation system, activate the ventilation system when the level of methane reaches 25 percent of the L.E.L.

b. At 25 percent of the L.E.L. initiate visual and/or audible alarms that alert occupants to evacuate the building and notify the Fire Department through the person or company responsible for providing the control station monitoring of the methane detection system.

c. Initiate visual and/or audible alarms at the control panel when there is an interruption of the sensor's sample flow system (for sample draw units only).

2. Installation

The methane detection system shall be designed for permanent installation and shall be supplied from a non-local switch controlled electric circuit.

The optimum location for the sensor units must be selected with consideration given to all possible gas entry locations and to normal air-flow patterns caused by doors, windows, and air supply and exhaust register units. In general, the optimum location of the sensors is within the air stream with the sensors calibrated to compensate for possible air dilution and diffusion of the gas from the point of entry to the sensor location. Items that tend to disrupt air flow patterns such as storage racks, furniture, heat generating equipment, fans, etc. must also be considered in determining the location of the sensors.

Visual and audible alarms shall be placed in areas where occupants of the building can readily see or hear them. Location of the alarms shall be approved by the Fire Department.

In buildings requiring a main control panel, the panel shall be located in an area which can be readily monitored by the person designated as the safety director. The location shall be approved by the Fire Department. A sign shall be affixed to the control panel providing directions for operating the system.

The manufacturer shall provide two operating, maintenance, service and installation manuals. One set is to be submitted to the Fire Department and the other is to be maintained on the premises.

3. Calibration and Maintenance of Methane Detector Sensors

A methane detector sensor shall be initially calibrated for operation at 25 percent of the L.E.L. upon installation and recalibrated every 90 days thereafter. Calibration shall be performed using methane test gas and the sensors shall be adjusted to within 3 percent of the specified percentage. An additional test shall be conducted to ensure the detectors monitor up to at least 100 percent of the L.E.L.

Except for the frequency of calibration as specified above, testing, maintenance, and service shall be performed in accordance with the manufacturer's written specifications by a factory trained individual or by a person certified by the Fire Department at least once a year. Records shall be maintained by the owner and shall be available for review by the Fire Department.

C. MEMBRANE SHIELD

The membrane shield material shall be a minimum 60 mils thickness sealing layer of an approved oil resistant high density polyethylene (HDPE) plastic sheeting, or approved equal. The membrane shield shall be installed under all new buildings, except single family dwellings and duplexes in the Potential Methane Zone and those with raised floors in the High Potential Methane Zone.

Plans and specifications for the membrane shield will be reviewed and approved by Building Plan Check and a building permit shall be obtained prior to installation. Membrane materials shall be approved under a general approval issued by the Research Division. When a foundation vent system is installed under the membrane shield, the vent system shall be shown on the membrane shield plans and the building permit shall not be issued until permits required for the vent system have been obtained.

1. Installation

The sheeting shall be placed between the bottom of the floor slab and the earth, around footings including pits, piles and caissons, and along the outer face of walls below grade. The sheeting shall not be placed under footings except for elevator pit footings. The shielding shall not be placed more then 6-inches below the bottom of the floor slab. Seams shall be lapped a minimum of four inches and sealed in accordance with the membrane manufacturer's written specifications.

Prior to placing the floor slab over the membrane, the membrane installer shall certify that the membrane has been installed and tested in accordance with the manufacturer's specifications and is free of leaks. A copy of this certification shall be filed with Building Inspection for approval prior to placement of concrete. Testing for membrane leaks shall be performed by a Los Angeles City approved testing agency.

2. Penetrations of the Membrane

Where footings, plumbing pipes, electrical conduits, etc. penetrate the membrane, sleeves or boots composed of the same shielding material or other approved material shall be provided to seal the space around the penetrations. These devices are to be bonded to the membrane material and sealed around the penetration with an approved sealant or other approved method in accordance with the manufacturer's specifications. Electrical conduits shall be of the type permitted by, and provided with seals as required by the appropriate sections of Article 501 of the National Electrical Code for Class I, Division 1, Group D locations.

2. Protection of the Membrane

The subgrade under the membrane shall be rolled smooth and well compacted. Angular material such as rocks and stones shall be covered by a sand layer to prevent puncture of the membrane.

The membrane shall be protected by a minimum 30 lb. roofing felt or other approved material placed between the floor slab and the membrane.

Reinforcing steel, piping, forms, etc. shall not be supported directly on the membrane or protective covering and equipment shall not be driven over the membrane or its protective covering.

D. FOUNDATION VENT SYSTEM

When a foundation vent system is required under the building, the vent lines shall be installed below the membrane shield. The system shall be designed by a qualified engineer.

Vent lines shall be minimum four inch slotted or perforated schedule 40 PVC pipe, or an approved equal, surrounded with at least three inches of fine gravel and backfilled to the surface with coarse gravel. Venting to an approved outlet shall be in accordance with the Plumbing Code.

Subsurface drainage systems are not to be combined with the methane vent system unless approved by the Mechanical Bureau.

Methane vent outlet risers shall be cast iron or other approved materials permitted by Section 1212 of the Uniform Plumbing Code and by the Fire Department. Risers located within buildings shall terminate at an approved outlet in accordance with Section 506 of

the Plumbing Code. Risers placed outside of the building shall terminate a minimum of 10 feet above grade, at least three feet from adjacent property lines, and at least 10 feet away from any openings into a building.

E. PAVED AREA VENT

When a paved area vent system is required, the vent system shall be designed by a qualified engineer. Vent lines shall consist of minimum four inch slotted or perforated PVC schedule 40 pipe, or approved equal, spaced as determined by the qualified engineer. The pipe shall be surrounded with at least three inches of fine gravel and backfilled with course gravel. The pipes shall be designed to support all live loads. A plumbing and fire permit shall be obtained prior to installation of the vent system.

Passive stand-pipe vent outlets shall be cast iron or other approved material. The outlets shall be designed and installed to relieve accumulations of methane gas and where installed in traffic areas or subject to physical damage, are to be protected. Gas vent outlets shall terminate a minimum of 10 feet above grade, at least three feet from adjacent property lines, and at least 10 feet away from any opening into a building.

III. QUALIFIED ENGINEER

The qualified engineer (gas control specialist) shall investigate and recommend mitigating measures which will prevent methane intrusion into the building. The engineer shall be responsible for preparing plans and supervising the installation of all approved methane mitigating measures.

After completion of the work, the engineer shall certify in writing that:

A. All methane control systems designed to mitigate hazardous concentrations of methane have been installed in accordance with the approved plans and specifications, and

B. The post-construction sampling and test program has been completed and tests indicate the absence of methane in the building.

The written certifications shall be submitted to the Mechanical and Building Inspection Divisions.

IV. EMERGENCY PROCEDURES

Emergency procedures must be provided for all existing and proposed buildings requiring a methane detection system and/or ventilation system, except single family dwellings. The owner of the building is responsible for the establishment, implementation, and maintenance of an emergency plan for the safe and orderly evacuation of the building. The emergency plan must be approved by the Fire Department.

The location of signs listing the Fire Department telephone number and the emergency plan procedures shall be shown on the building permit set of plans. The locations of the signs shall be approved by the Fire Department.

Also, a note is to be placed on the plans specifying that the emergency procedures as required by Section 91.1507 of the L.A.M.C. shall be submitted to and approved by the Fire Department.

V. APPLICATION OF METHANE SEEPAGE DISTRICT REGULATIONS TO LOCATIONS OR AREAS OUTSIDE THE METHANE BOUNDARIES

When the Department of Building and Safety suspects the presence of methane in a building, the owner will be required to hire a qualified engineer to evaluate the potential for methane intrusion. A report of the investigation and recommendations for mitigating the potential hazard shall be submitted to the Grading Division for review and evaluation. If the Grading Division determines the site to be potentially hazardous, any or all of the mitigating measures of Division 15 may be required.

Approved:

Bob Harder, Acting Chief of Building Bureau

K. R. Ayers, Chief
Mechanical Bureau

Robert J. Picott, Chief
Resource Management Bureau

Davis R. Parsons, Deputy Chief
Fire Prevention Bureau
Los Angeles Fire Department

Read by:
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Tim Taylor
Executive Officer