BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CLIFORNIA

Rita Boppana, Complainant, vs. Southern California Gas Company, Defendant.	Case 00-05-010 (Filed May 11, 2000)
And Related Matters.	Case 00-05-011 (Filed May 11, 2000) Case 00-05-012 (Filed May 11, 2000)

UPDATED / AMENDED TESTIMONY OF GRASSROOTS COALITION

(Pursuant to Administrative Law Judge's Ruling Setting Schedule for Continued Evidentiary Hearings in the Complaint Proceedings, dated August 15, 2005)

September 29, 2005

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TABLE OF CONTENTS

I. BACKGROUND:

A. JUDGE'S RULING OF AUGUST 15, 2005:

Evidentiary Hearings began in the subject Complaint Proceedings in April 2005. Pursuant to the "Administrative Law Judge's Ruling Setting Schedule for Continued Evidentiary Hearings in the Complaint Proceedings," dated August 15, 2005, the following updated/amended testimony is being submitted herein. This testimony, and supporting exhibits, is being submitted to augment the previous record and exhibits.

The Evidentiary Hearings (EH) have been scheduled to continue in the proceedings consolidated for hearings on November 16-18, and November 21 and 22, 2005 (the Commission has reserved the two additional hearing days of November 21 and 22, if necessary).

The hearings are scheduled for the Commission's Los Angeles Courtroom located at 320 West 4th Street, 5th Floor, Los Angeles, California, beginning at 11:00 a.m.

All exhibits not already included as part of the prepared testimony should be exchanged in advance of the meet-and-confer scheduled for no later than Wednesday, November 9, 2005.

B. EVIDENTIARY HEARINGS REGARDING § 851 LOT SALES:

Evidentiary Hearings were held on August 2-4, 2005 In the Matter of the Application of Southern California Gas Company for Authority Pursuant to Public Utilities Code Section 851 (hereinafter, § 851) to Sell Certain Real Property in Playa del Rey. Many of the issues therein overlap and are interconnected with this Complaint Proceeding. These include environmental hazards especially related to well leakage problems, and monitoring and evaluation of such hazards in the near surface soils and water.

For the foregoing reasons, exhibits and testimony relating to the § 851 Hearings are to be incorporated into this proceeding to avoid duplication, and will be relied upon herein to update/amend the testimony in this complaint proceeding.

In particular, Complainants will rely upon the "Intervenor's Prepared Testimony," and attached Exhibits, dated June 20, 2005 to the extent previously ruled upon by the Administrative Law Judge during the August 2-4, 2005 Hearings. In addition, certain exhibits and testimony was further discussed in the Opening and Reply Briefs submitted therein. When appropriate herein, these matters will be commented upon within the context of avoiding duplication of the entirety of the exhibits set forth in that proceeding.

C. CONSUMER PROTECTION AND SAFETY DIVISION OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION, REPORT DATED AUGUST 20, 2002, REVISED ON NOVEMBER 18, 2004 WILL BE RELIED UPON REGARDING LEAKING STORAGE GAS:

The Consumer Protection and Safety Division of the CPUC prepared a report dated August 20, 2002, and revised on November 18, 2004. This report is based upon soil gas and water well testing results performed in areas overlying the mineral rights owned and possessed by SOCALGAS, or immediately adjacent thereto.

This report will be used to establish that, based upon reasonable scientific certainty, storage gas belonging to SOCALGAS is migrating into the surface right areas, owned or occupied by others (viz., above 500 feet below ground level, and above the area authorized for gas storage). In summary, this report states the following:

(a) Evidence of three types of natural gas in PDR,

(b) 133 PPM Helium in a natural gas sample from a bar hole near Big Ben well,

(c) 22 PPM Helium from a shallow probe by John Sepich & Assoc.,

(d) Greater than 800 PPM Helium from groundwater samples,

(e) ETI report indicated Thermogenic gas components detected in shallow subsurface geologic units and H2S detected in soil gas samples,

(f) Previous reservoir inventory analysis,

(g) 50,000 PPM gas detected at Troxel Well and known migration loss to well,

(h) Potential problems with validity of some SoCalGas data.

- 133 PPM HELIUM FROM BAR HOLE SAMPLES NEAR THE BIG BEN WELL:

"SOCALGAS internal office memorandum, dated November 20, 1991 revealed that gas samples collected from bar-holes around Big Ben well contained 30,000 PPM to 620,000 PPM natural gas and these samples contained 133 PPM to 188 PPM Helium."

- 22 PPM HELIUM FROM A SHALLOW PROBE SAMPLE BY JOHN SEPICH AND ASSOCIATES:

"Isotech Laboratory performed an isotopic analysis of a gas sample submitted by Sepich & Associates on 3/25/99. Sepich and Associates was working for Playa Vista developers (developers of residential and business properties around the PDR Storage field. The isotopic analysis report indicates the gas sample was collected from Playa Vista Project Area-D. The analysis report also revealed presence of Ethane and 22 PPM Helium in the gas sample. The significance of this isotopic analysis report is the presence of Storage Reservoir gas or Native PDR gas signature and the location where the gas sample was collected (Area – D) of Playa Vista Project). My opinion is that the probability of Storage Reservoir gas sample from PDR area containing Ethane and 22 PPM Helium is greater than 50 percent (>50%). Furthermore, the location where the sample was collected should be of major concern."
(emphasis added)

- GREATER THAN 800 PPM HELIUM FROM GROUNDWATER SAMPLES:

"City of Los Angeles Building and Safety department retained ETI to conduct test, analyze and provide advice on Playa Vista project. Groundwater samples were collected in 2000 from Playa Vista Project Area and dissolved gases were extracted and analyzed by ETI in addition to other scientific sampling and testing. Several groundwater samples revealed presence of high Helium concentrations and Methane dissolved in the groundwater."
(emphasis added)

- PRESENCE OF METHANE GAS AROUND TROXEL WELL:

> "As part of Energy Division (ED) initial preliminary investigation, ED retained MHA, who subcontracted Giroux & Associates to conduct site investigations at the Troxel and Lor Mar well site locations in 2001. These recent studies found very high Methane concentrations (greater than 50,000 PPM) at the Troxel site and low Methane concentrations (1 to 6 PPM) at the Lor Mar site." (emphasis added)

Helium is the gas constituent used by SOCALGAS, and by others, in the context of a "tracer gas" that identifies the source of the migrating oilfield gases as originating from the gas storage field. This tracer gas arrives as a native ingredient from the Texas and Oklahoma Gas Fields, where much of the SOCALGAS storage gas has been purchased. Although other tracer gases are routinely used to detect leaks in gas storage reservoirs, SOCALGAS has not attempted to use these "industry standard" tracer procedures to support their claim that:

> "In over 50 years of operation, there is no evidence that gas has been lost from the reservoir through vertical or horizontal migration, nor that gas has migrated from the PDR storage field into nearby soil." (Revised Supplement to PEA, P.3-23.)

See, for example, the "Revised Supplement to the Proponent's Environmental Assessment" at Page 3-23, Paragraph 3.11.2.1 therein, under the title, "Potential for Gas Leakage," prepared by SOCALGAS and authored by David R. Clark, Glen J. Sullivan and Joyce A. Padleschat, attorneys for SOCALGAS. This PEA is dated October 13, 2000. SOCALGAS knew, or should have known, by this date that oilfield gases containing high levels of Helium were migrating into the near surface soils and water.

However, other deficiencies have been identified in the procedures used by SOCALGAS in performing soil gas testing. The CPUC, in the above identified report concluded (at Page 8 therein):

(1) "Data collected by SOCALGAS may be flawed."

(2) "Procedures used by SOCALGAS to collect gas samples at the Troxel did not follow standard gas collection and sample handling procedures established by Federal Environmental Protection Agency and other trade associations."

(3) "A plastic sheet was used to accumulate enough gas to collect samples for analysis. Samples were collected in plastic bottles. Since plastic is permeable to many gases, and may also absorb some hydrocarbon based gases, test results would not fully characterize gas emitted from the well." (emphasis added)

Hearing Testimony will identify pictorially the methods employed by SOCALGAS in using flame ionization detectors, in conjunction with bar holes, in performing soil gas testing. The flawed nature of this testing procedure will be discussed by setting forth the "industry standards" regarding using specially designed soil probes, placed at various depths, in order to properly characterize the near surface soil gas concentrations. The use of these procedures will be discussed in conjunction with water wells, that monitor "free" and dissolved oilfield gases, especially within the near surface aquifers.

At Playa del Rey, these water wells have routinely been drilled down to the "50 Foot Gravel" (sometimes referred to as the Ballona Aquifer, or the most shallow of the aquifers). Both "free gas" and dissolved gas (using the "bubble pail" method) test results will be discussed. This will include the test results and the procedures employed by Exploration Technologies, Inc. (ETI), in performing their studies for the City of Los Angeles.

The ETI studies have been set forth in detail in multiple documents, equally available to all interested parties herein. These results have clearly demonstrated the accumulation of large quantities of thermogenic gas within the highly permeable aquifer comprised of the "50 Foot Gravel." This aquifer will be illustrated as being interconnected with the hundreds of holes that were drilled into the Playa del Rey Oilfield during the 1930's and 1940's by Union Oil of California (UNOCAL).

The technology used by UNOCAL in drilling these holes, including their completion practices, will be shown to be the same as used by UNOCAL in drilling the Montebello Oilfield in the 1930's. Accordingly, it will be shown as to the relevance of the leaking wells in the Montebello Gas Storage Field, to the leaking wells at Playa del Rey.

The testimony will rely upon, and will discuss the relevant findings of the CPUC "Investigation into the Operations and Practices of the SOCALGAS Concerning the Accuracy of Information Supplied to the Commission in Connection with the Montebello Gas Storage Facility," dated April 22, 1999. A copy of this report is equally available to all parties herein. In relevant part, this Investigation stated:

> "Oil was first discovered at Montebello in 1939 by Union Oil of California (UNOCAL). During the 1940's hundreds of holes were drilled in this field, but were never properly abandoned. Thus, <u>there are many conduits linking the gas storage area to shallower zones above the storage area, creating pathways for gas to escape and eventually reach the surface beneath homes</u>."
> (At Page 3 of the Report, emphasis added.)

This will be discussed in the context of providing notice to SOCALGAS as to the necessity of performing adequate soil gas monitoring studies, and the evaluation of gas concentrations in shallow aquifers using water wells.

This Investigation Report by the CPUC identifies the following monitoring procedures that were implemented at Montebello:

> "SCG installed <u>24 gas monitoring wells, as well as a shallow gas collection system</u> due to problems with gas leakage from the ground into homes."

This Investigation Report also states:

> "According to information obtained from the Division of Oil & Gas, it was during the 1980's that gas was discovered to be leaking into shallow zones beneath the City of Montebello,

probably through old oil and gas wells that had not been properly abandoned."
(emphasis added)

Testimony will be presented as to the standard methods employed to evaluate shallow zones for gas migration from oilfields, and how individual leaking wells are identified using these procedures. Both soil gas concentrations, and isotopic procedures are routinely used for these purposes.

Examples will be presented where shallow zones were evaluated for gas concentrations using a combination of shallow, intermediate and deep soil probes. The results are reported in the "Draft Environmental Impact Report" prepared for the Central L.A. Area New High School No. 11 & Vista Hermosa Park, dated January 2004. These results were used to quantify the large quantities of oilfield gases, including Hydrogen Sulfide, that were migrating upward into the school site from the underlying City of Los Angeles Oilfield.

Other examples will be presented to illustrate the use of soil probes to determine the source of the leaking gases that caused the Ross Department Store explosion in March 1985, and the subsequent serious gas leakage problem detected in 1999, in the same area. These methods will be used to demonstrate how the exact location of the source of the leaking gas was identified.

The leak that caused the Fairfax explosion was determined to have originated from corrosion holes located in the steel casing of the Metropolitan Number 5 Well. Oilfield gas leaked upward from the corrosion holes and concentrated in a shallow, permeable collector zone directly below the explosion site. These conditions will be illustrated, along with the well records for the Metropolitan Number 5 Well. These data will also show the extensive, and costly, repair that was performed in order to plug the corrosion holes.

Regarding corrosion problems, that are routinely experienced in oil and gas wells, testimony will be presented on the manner and scientific principles that influence this serious problem in the oil and gas industry. Many references, including a Society of Petroleum Engineering (SPE) study on the seriousness of Hydrogen Sulfide in contributing to corrosion holes in oil and gas casings will be discussed regarding the wells herein.

Detailed information will be presented regarding how corrosion holes in a well casing, associated with a gas storage field located in Hutchinson, Kansas, was responsible for a major explosion and fires in that town.

In summary, if proper soil gas monitoring procedures had been employed by SOCALGAS, including the use of shallow monitoring wells patterned after Montebello, the seriousness of the gas seepage problems could have been properly characterized.

D. THE GAS INVENTORY MONITORING VERIFICATION, AND REPORTING PROCEDURES DEVELOPED BY SOCALGAS NEED TO BE IMPLEMENTED AT PLAYA DEL REY:

SOCALGAS developed a "Gas Inventory Monitoring, Verification, and Reporting Procedures," that is described in detail in "Appendix A" of a report titled, "Proponent's Environmental Assessment for the SOCALGAS Proposed Sale of Lots," dated June 2000.

Appendix A was discussed by James Mansdorfer during the Evidentiary Hearings held pertaining to the Lot sales. In relevant part, his testimony included the following:

> "A Well, like I said earlier, Appendix A is strictly oriented toward storage operations. If there were some indication that storage gas was in this shallow aquifer, then yes, we would be doing something like that."
> (emphasis added)

Substantial evidence has been produced, including the findings of the Consumer Protection and Safety Division of the CPUC, regarding the high levels of Helium (viz., a marker for storage gas) to dictate the implementation of the "Appendix A" procedures at Playa del Rey.

Also, the City of Los Angeles studies conducted by ETI confirmed the presence of high levels of Thermogenic gas constituents measured within the "50 Foot Gravel" permeable zone. The ETI studies demonstrated the feasibility of drilling into this zone, for purposes of collecting "free" and dissolved gas samples. These samples included Helium, and Oilfield Chemicals that could only be coming from the mineral rights owned by SOCALGAS.

Paragraph 2(a.) of Appendix A describes an important requirement to implement at Playa del Rey:

> "Non-storage zone wells monitored include both Company wells and wells owned by others in overlying and underlying zones and in other fields within two miles of the storage reservoir boundary, where applicable."

Paragraph 2(a.)(iii.) provides in relevant part:

> "In some fields, shallow water observation wells have been drilled into aquifer zones existing in the first permeable sand above the shoe of the surface casing. These wells are closed in at the surface and gas concentrations in the wellbore are measured weekly."

Paragraph 2(a.)(viii.) provides in relevant part:

> "Shallow water observation wells are closed-in at the surface and gas concentrations in the wellbore measured periodically."

Trial testimony will identify the appropriate procedures for implementing these steps at Playa del Rey. As discussed previously, the permeable sand (and gravel) zones need to be measured for gas concentrations (both free and dissolved gases). Most important would be the "50 Foot Gravel," located at a depth below ground level of approximately 50 feet. Experience

has shown that the drill rig crew can sense when the drill bit has reached the gravel zone. Also, a permeable sand zone has been identified in some areas at a depth below ground level of approximately 20 feet. Typically, the "50 Foot Gravel" soil gas measurements are much higher than those found in the shallower sand zone.

What has been clearly demonstrated experimentally is the fact that the soil gas within the "50 Foot Gravel" migrates upward into the shallower sand zone. However, the "50 Foot Gravel" is being constantly recharged from below with oilfield gases (viz., thermogenic gases).

Gas flux studies performed on the surface have confirmed the constant nature of the upward migrating gases, eventually reaching the air space subtending the gas storage field, and oilfield operated by SOCALGAS.

The gravest danger posed by the upward migrating oilfield gases is the potential for these gases to collect in a confined space, where a spark could cause an explosion and/or fires.

E. THE CITY OF LOS ANGELES STAFF REPORT IDENTIFIES THE THERMOGENIC GAS MIGRATION SOURCES AND EXPLOSION HAZARDS AT PLAYA DEL REY:

A City of Los Angeles Staff Report was prepared on December 23, 2003, for submittal to the City Council on proposed amendments to Division 71 of Article 1, Chapter IX of the Los Angeles Municipal Code to establish citywide Methane mitigation requirements.

Testimony will be presented regarding the findings identified in this report regarding the Playa del Rey Oilfield and Underground Gas Storage Facility. The relevant findings that will be discussed include the following:

> "Thermogenic Methane is found in soil near oilwells and oilfields depending on the horizontal and vertical permeability of underground rock formations."

> "The 2001 Task Group studied the DOGGR oilwells, oil fields, and underground gas storage facilities, maps and the City's Environmental Affairs Department landfill records and found the occurrence of Methane in soil gas to be correlated with the location of oil wells, oilfields, underground gas storage facilities, and landfills."
>
> "Methane seeping from the earth becomes a fire and explosion hazard when, in concentrations of approximately 53,000 parts per million by volume (PPMV), accumulates in an enclosed space with a source of ignition."
> (emphasis added)

The testimony will identify that the proposed citywide Methane mitigation requirements were prompted by the very high levels of Thermogenic (oilfield) gases discovered as part of the soil gas testing performed for the Playa Vista Development:

> "One of the areas not previously identified where Methane was encountered is Playa Vista for the Playa Vista Project, LADBS, along with its peer reviewer, Exploration Technologies, Inc., (ETI), investigated the location and source of the Methane and determined the soil gas source at Playa Vista was Thermogenic (originating from oilfields) and developed a Methane mitigation system for the site."

Testimony will focus on the large continuous "50 Foot Gravel" zone that provides high permeability for lateral migration from the leaking wells, located to the immediate west of the Playa Vista development. This pathway for lateral migration extends west-to-east, facilitated by tidal forces and an updip elevation change, to promote gas migration easterly along the alignment of the original Los Angeles Riverbed. This alignment was responsible for the large gravel zone, that was extensively characterized by Dr. Poland, a State hydrologist. He prepared an extensively published report, that provides a detailed characterization of the lateral and vertical extent of the "50 Foot Gravel." This was done to identify the extent of the freshwater aquifer associated with the "50 Foot Gravel."

The importance of performing a proper geological characterization of these lateral gas migration pathways will be illustrated by the findings and recommendations of the Kansas Geological Survey, following the Hutchinson, Kansas fire and explosions related to an underground natural gas storage leak from an improperly maintained wellbore. In particular, a report dated March 13, 2001 was presented to the House Environmental Committee of the State of Kansas titled, "Geology of Natural Gas Pathways and Accumulations Under Hutchinson, Kansas."

The lessons learned from that disaster reveal the importance of properly evaluating the near surface geological conditions, that profoundly influence the pathways of migration under urban developments. The above-identified report discusses:

- Determining what layers might serve as geologic conduits for gas under the city;
- Producing subsurface geologic maps of relevant horizons;
- Developing a geologic model to guide drilling of vent wells and other remediation actions;
- Compiling reports on the history of subsidence.

The study results of Dr. Racine Tek regarding the Hutchinson, Kansas explosion will also be discussed regarding his findings relating to the gas migration pathways, and wellbore corrosion holes that combined in a way as to directly cause the gas storage field disaster. These results are directly relevant herein in providing notice of the importance of performing a proper evaluation of the interaction between geological and corrosion hazards in characterizing the explosion hazard existing at Playa del Rey.

SOCALGAS has developed a corporate philosophy of denying the existence of vertical or horizontal gas migration, and denying that gas has migrated from the PDR Storage Field into nearby soils, as previously discussed herein. This denial has resulted in a failure by

SOCALGAS to perform proper soil gas studies, and to conduct appropriate geological studies for protecting against the risks of explosions and other health hazards.

The primary purpose of this Complaint is to bring about changes to this corporate philosophy so that pubic health and safety is properly protected. The proposed changes will be discussed as part of the Evidentiary Hearing, and a summary of the recommended actions will be described herein.

II. SOCALGAS SHOULD BE REQUIRED TO COMPLY WITH THE CONDITIONAL USE PERMIT ISSUED BY THE CITY OF LOS ANGELES REGARDING BEING PROTECTIVE OF PUBLIC HEALTH AND SAFETY:

The Conditional Use Permit issued by the City of Los Angeles in 1955 regarding operational conditions imposed upon SOCALGAS for health and safety reasons intended to be protective of the surrounding residential community, included the following:

> 13. "That all production equipment used shall be so constructed and operated that no noise, vibration, dust, odor or other harmful or annoying substances or effect which can be eliminated or diminished by use of greater care shall ever be permitted to result from production operations carried on at any drilling site or from anything incident thereto to the injury or annoyance of persons living in the vicinity; nor shall the site structures thereon be permitted to become dilapidated, unsightly or unsafe. Proven technological improvements in methods of production shall be adopted as they, from time to time, become available if capable of reducing factors of nuisance or annoyance."
> (emphasis added)
>
> 17. "That the underground gas pressure shall be kept sufficiently low so that there will be no escape of gases into the air above ground."
> (emphasis added)

Conditional Use Permit Number 13 imposes a requirement upon SOCALGAS to use best available technology to prevent the release of odors or other harmful substances that would result in injury or annoyance of persons living in the vicinity.

Testimony will be presented that numerous complaints have been made by residents regarding the odors, or other harmful substances, that have been released to the air causing exposure to persons living in the vicinity. This testimony will demonstrate that best available technology is not being used, that could otherwise eliminate or diminish these results.

The releases can generally be described as coming from the following sources:

(1) Intentional releases of large quantities of storage gas to the air as a result of equipment repairs, and well servicing. Each well is inter-connected by an underground gas line that is bled off to a blow-down stack located at the tank farm area. These gases are blown to the air at the time of well servicing. The odorants contained in the gas contain sulfur compounds that are very annoying to smell (viz., a rotten egg odor). Also, the natural gas contains Benzene and Toluene, chemicals known to the State of California to cause cancer and birth defects.

(2) Intentional releases of storage gas that leaked upward into the surface casing area of many of the wells. These surface casings accumulate gas, causing the pressures to rise. Valves located at the well head are periodically opened to allow the gas to be vented to the air in the immediate vicinity of homes.

(3) Fugitive emissions from the vapor recovery system operated in the tank farm area. The vapor recovery system is intended to prevent the release of oilfield chemicals from the production operations. However, because of poor maintenance practices, this equipment is prone to failure, causing the release of toxic chemicals into the community.

(4) Compressor station exhaust emissions are vented into the air in close proximity to homes. These emissions contain toxic air contaminants, including Benzene, Formaldehyde, and other toxics. The vent stacks need scrubbers installed to comply with the best available technology requirement of the conditional use permit.

Conditional use permit Number 17 requires the underground gas pressure to be kept sufficiently low so that there will be no escape of gases. Testimony will be presented that this pressure should not exceed 700 pounds per square inch. Reservoir pressures above this level have been demonstrated to cause storage gas to leak out of the primary storage area. This is

the only area that has been authorized for storage purposes. Leakage into the surrounding zones is responsible for the largest inventory losses, even though some of the gas is recaptured. Very large inventory losses have been reported by Dr. Racine Tek, an expert on under-standing gas storage inventory.

Testimony will be presented as to how these large inventory losses occur, and the historical tracking of inventory, including cushion gas irregularities.

III. SUMMARY OF RECOMMENDATIONS THAT NEED TO BE IMPLEMENTED AT THE PLAYA DEL REY GAS STORAGE FACILITY TO BE PROTECTIVE OF PUBLIC HEALTH AND SAFETY:

A. SOIL GAS MONITORING PROGRAM:

A soil gas monitoring program needs to be implemented using soil gas probes that can accurately measure gas concentrations at both shallow and deeper depths, at least reaching the "50 Foot Gravel." Also, water wells need to be installed to monitor for free and dissolved gases within the fresh water aquifers. The fresh water needs to be evaluated for BTEX concentrations, especially Benzene and Toluene that are highly soluble in water, and will concentrate as a result of the ongoing upward migration of oilfield gases.

Especially alarming are the measurement results reported in the Brown and Caldwell Report dated April 2004, performed at the Troxel well site location. Detected groundwater concentrations of Benzene were measured at 9.1 µg/L. This report identifies that the primary maximum contaminant level (MCL) for Benzene is 1 µg/L. Accordingly, the limited studies that have addressed the hazards posed by the Benzene concentrations in groundwater would indicate a hazard level more than nine times higher than the MCL.

The implications of this will be discussed in the context of the City of Santa Monica's and the City of Hawthorne's water usage from the impacted Ballona and Silverado Aquifers,

that overly the subject oilfield gas seepage. The geographical implications of this environmental hazard will be illustrated during the Trial testimony, based upon detailed site characterizations that have been analyzed in addressing this issue.

B. WELL INTEGRITY EVALUATION:

Each well within the Playa del Rey Oilfield needs to be evaluated for leak integrity, including all abandoned wells. Historical well records need to be reviewed for each well, and a risk assessment performed regarding the potential for leakage. The methodology required by the City of Huntington Beach would serve as a standard of care model.

C. SUBSIDENCE MONITORING:

Subsidence monitoring needs to be implemented to be compliant with State laws regarding avoiding subsidence in coastal areas from oilfield fluid production. Subsidence had been monitored for the Playa del Rey Oilfield up to approximately 1970. This showed a high degree of correlation between the fluid production from the oilfield and the subsidence. No subsidence studies have been performed since that time, even though the cumulative subsidence had reached nearly three feet by 1970.

A water injection program was initiated, but was not continued. The correlation between land subsidence and gas migration has been well established, including its impact upon degrading well integrity.

D. BEST AVAILABLE TECHNOLOGY:

Upgraded technology needs to be installed at the compressor station, and other air toxic venting locations to prevent the exposure of residents to the toxic air emissions currently

occurring at these locations. This would include the use of scrubbers, and appropriate monitoring equipment regularly used for such purposes in implementing proper environmental controls.

E. LOWER GAS STORAGE RESERVOIR PRESSURE:

The pressure within the primary gas storage area needs to be lowered to 700 pounds per square inch. This is to prevent gas migration from the authorized "primary" storage area into the unauthorized storage areas, including the "Gas Cap," "Townsite" and "Troxel" areas. This is also necessary to minimize the risk of well leaks resulting from the high pressure reservoir conditions, and migration to surrounding areas.

DATED: September 29, 2004

By: _____

Patricia McPherson
GRASSROOTS COALITION,
on behalf of Complainants

CERTIFICATE OF SERVICE

I hereby certify that I have this date, served a copy of "Updated Amended Testimony of Grassroots Coalition" dated September 30, 2005 to all known interested parties of record in the SOCALGAS Safety Complaint Cases No. 00-05-010, 00-05-011 and 00-05-012 to email addresses provided by the CPUC of the above document.
Attached is a copy of the CPUC email list.

Dated in Los Angeles this 30th day of September, 2005.

Mary K. Knight