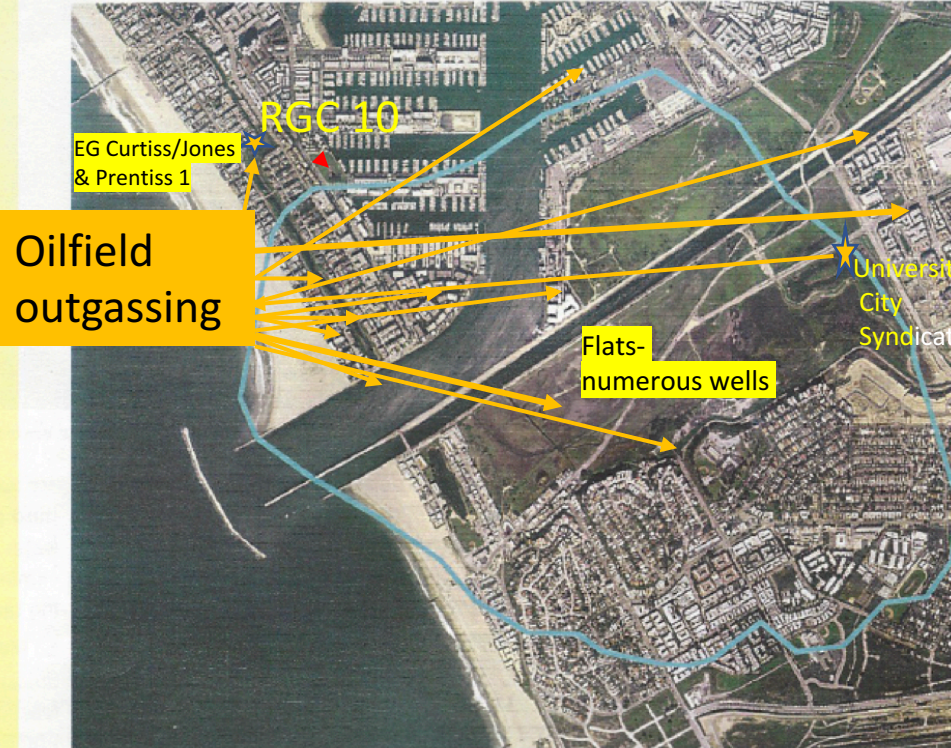


Playa del Rey natural gas storage operations

Playa del Rey storage field overview

The Playa del Rey storage field was originally an oil field that produced during the 1930s. Following more than ten years of production, the pressure in the field dropped to a level that was less viable for oil production, but very suitable for natural gas storage. In 1942, the U.S. government initiated underground storage of natural gas as part of the war effort to ensure that a dependable source of energy was available. Pacific Lighting (a predecessor of The Gas CompanySM) operated the reservoir and purchased it in 1955. The Gas Company continues operating the field today - 65 years later.

The sandstone formation holding the gas is around 6,100 feet below ground level. This formation is covered by 1,500 feet of impermeable shale, sealing the porous storage area. We operate 54 active wells in order to inject and withdraw gas from the reservoir formation. Three compressors are used to inject



Aerial view of the Playa del Rey area. The blue line indicates the approximate boundaries of the "area of influence" of the operations of The Gas Company.

On December 20th, 2007 the California Public Utilities Commission ("CPUC") approved a settlement agreement of complaint cases relating to the natural gas storage field owned and operated by The Gas Company in the

mailing because your home or business is located within the facility's "area of influence," defined as the geographical boundaries of our underground reservoir plus one-quarter mile in all directions.

The boundaries of the area of influence

Outgassing is documented in all of these areas as being thermogenic. As of 2007, EVEN the CPUC Report cited a greater than 50% chance that the gases surfacing at Playa Vista are SCG reservoir gas.

Since that time more data has become available to demonstrate SCG reservoir gas leakage to the surface, including DOGGR ORDER 1008, which shut down SCG/PDR operations for about a year due to reservoir gas leakage to the surface

17. That the underground gas pressure shall be kept sufficiently low so that there will be no escape of gases into the air above the ground.

City Plan Case 6162

-4-

April 8, 1955

11. That all liquids produced shall be carried away by pipe lines.
12. That all existing wells within the City of Los Angeles may be redrilled and/or cleaned out, but that not more than three new wells may be drilled from the surface of property within the present City limits of Los Angeles without the further consent of the Los Angeles Department of City Planning.
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 the 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.
14. That the operators shall remove the derrick from each well within thirty (30) days after the drilling of said well has been completed, and thereafter, when necessary, such completed wells shall be serviced by portable derricks.
15. That in connection with all drilling operations, including redrilling or cleaning out of existing wells, sound shall be restricted to conform to generally accepted standards for sound-controlled drilling in residential areas of Los Angeles County.
16. That suitable precaution shall be taken to minimize hazards to children, including the fencing of well sites. Said fencing shall be of a chain-link type and 8 feet in height.
17. That the underground gas pressure shall be kept sufficiently low so that there will be no escape of gases into the air above the ground.
18. That all pipe lines outside the defined plant area shall be below the surface of the natural ground level.

Conditional Use Permit

City of Los Angeles;
City Plan Case 6162

The underground gas pressure IS NOT KEPT sufficiently low to prevent escape of gases above the ground.

The migration of gases laterally, outside the approved 240 operational acres and the vertical, surfacing of reservoir gas has been occurring since SCG ownership operation and increased gas pressurization.

This conditional use grant does not waive the necessity of securing any other required permits or licenses. If any condition of this grant is violated, or if the same is not complied with in every respect, then this conditional use shall be subject to revocation, as provided for in Section 22.02 of the Municipal Code. Unless an appeal is filed with the City Clerk,

City Plan Case 6162

-5-

April 8, 1955

Your attention is called to the provisions of Section 12.24-E that this approval is conditional upon the privileges being utilized within one hundred and eighty days (180 days) after the effective date of the approval, and if such privileges are not utilized, or construction work is not begun within said time and carried on diligently to completion of at least one usable unit, the authorization to establish the use shall become void.

This conditional use grant does not waive the necessity of securing any other required permits or licenses. If any condition of this grant is violated, or if the same is not complied with in every respect, then this conditional use shall be subject to revocation, as provided for in Section 22.02 of the Municipal Code. Unless an appeal is filed with the City Clerk, the Commission's determination in this matter shall become effective ten days from the date of this communication.

Very truly yours,

Edith S. Jameson
Edith S. Jameson
Secretary

ESJ:nms

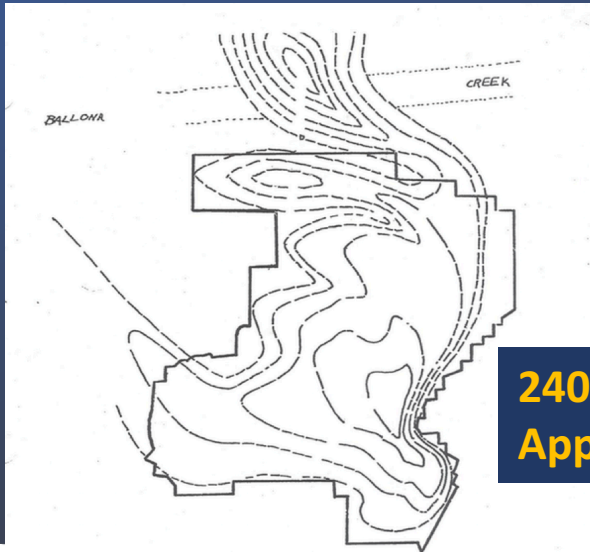
THE CONDITIONAL USE PERMIT IS SUBJECT TO REVOCATION

CONDITION 17 Has Been Continually Violated Since SCG Has Been In Operation.

NO APPROVAL HAS EVER BEEN GIVEN BY THE CPUC OR THE CITY OF LOS ANGELES FOR SCG/PDR TO EXPAND ITS FIELD OF OPERATIONS BEYOND THE APPROVED 240 ACRES. SCG's operational area extends far beyond 240 acres.

SCG knew that for any expansion, LA CITY approvals were needed. The 240 acres have definite site boundaries. (Condition 1. of LA CITY PLAN CASE 6162.)

The expansion of the SCG underground operations needed similar approval but, SCG did not ask, and did not bring City attention to their gas migration out of the approved storage area or alert the City or the public to the surfacing oilfield/reservoir gas.



240 Acres Boundary of Approved Operation

Southern California Gas Company



810 SOUTH FLOWER STREET • LOS ANGELES, CALIFORNIA

S. A. BRADFELD
Manager Gas Supply

April 4, 1955

Mailing Address
BOX 3249 TERMINAL ANNEX,
LOS ANGELES 54, CALIFORNIA

Mr. J. Harry Jobe, Examiner
Department of City Planning
361 City Hall
Los Angeles 12, California

Dear Mr. Jobe:

Some time ago at our meeting with you, Mr. Vander Heyden and I gave you a description of the proposed plant site at Playa del Rey. We now find that this description does not provide adequate space for our development if we are unable to move the liquid storage tanks to the county territory at the bottom of the hill. We are attempting to secure permission to make this move but feel that it is essential that we retain space within the proposed plant site for a minimum of necessary liquid storage should our efforts be unsuccessful.

In order to provide this additional space, the attached revised description has been prepared. We would appreciate the substitution of this description for that contained in Condition No. 1 of the tentative "Conditions" which you sent to us with your letter of March 29, 1955.

I am sorry that we need to make this change at such a late date but feel that it is essential that we provide assurance of proper space for relocation of the liquid storage.

Very truly yours,

Handwritten signature of S. A. Bradfield.

SAB:cew
Attachment



DIVISION OF OIL,
GAS, & GEOTHERMAL
RESOURCES

801 K STREET
MS 20-20
SACRAMENTO
CALIFORNIA
95814

PHONE
916/445-9686

FAX
916/323-0424

TDD
916/324-2555

INTERNET
consvr.ca.gov

GRAY DAVIS
GOVERNOR

DEPARTMENT OF CONSERVATION
STATE OF CALIFORNIA

August 7, 2001

Mr. John Davis
Coalition to Save the Marina, Inc.
P. O. Box 9291
Marina Del Rey, CA 90295

Dear Mr. Davis:

I have received your California Public Records Act request for documents regarding the Southern California Gas Company's (SCGC) gas storage project in the Playa del Rey oil field. The following is provided in response to your request.

1. The original approval of the project was facilitated through the Federal Government Office of the Defense Plant Corporation and the California Public Utilities Commission in the 1940s. Please contact these organizations for a copy of the approval. The Division does not have a copy of that approval in its files.
2. A copy of the Division's project approval is enclosed. The maps in the project file are interpretive data that are held in confidence by the Division pursuant to Government Code section 6254(e), Public Resources Code section 3234(d), and California Code of Regulations section 1997.4. You must obtain a record release from SCGC before we can provide the maps to you.

3. There is no record of any project expansion proposals, so there are no documents responsive to your request.

4. Same response as to item 3.

5. Records of geologic faults in the Playa del Rey field are part of the geologic maps submitted by SCGC. These are considered interpretive data pursuant to the statutes and regulation cited above. You must obtain a record release from SCGC before we can provide that information to you. However, there is an article on the project in the Division's "Summary of Operations", Vol. 39, No. 2, that can be obtained through our website on the Internet. (www.consvr.ca.gov <<http://www.consvr.ca.gov>>).

I hope that the above information is of assistance to you.

Sincerely,

William F. Guerard, Jr.
State Oil and Gas Supervisor

cc: R. K. Baker, District Deputy
A. Hager, Deputy Attorney General

Enclosure

**To 1986- NO
PROJECT APPROVAL
BY DOGGR; ONLY
INDIVIDUAL WELL
PERMITS ISSUED**

3. There is no record of any project expansion proposals, so there are no documents responsive to your request.

2001- PRA RESPONSE

CALIFORNIA - RESOURCES AGENCY
DIVISION OF CONSERVATION
DIV. OF OIL AND GAS
BROADWAY, SUITE 475
SAN FRANCISCO, CA 94102-4433
(415) 774-3311

til 10, 1986
dated July 23, 1986

W. Courley, Agent
SOUTHERN CALIFORNIA GAS CO.
Underground Storage Dept., M.T. 325-B
Box 3249 Terminal Annex
Los Angeles, CA 90051

GAS STORAGE PROJECT
Playa del Rey Field
Del Rey Hills Area
Conglomerate Zone

Sections 3008 and 3403.3 of the Public Resources Code give the Division of Oil and Gas responsibility for wells that inject and withdraw natural gas from an underground storage facility. Our records indicate that, although individual wells have been permitted, project approval has not been issued by the Division to conduct underground gas storage operations in the Playa del Rey field. Therefore, continued operation of the project is approved with the following provisions:

1. Form OG105 is filed whenever a new well is to be drilled for use as an injection-withdrawal well for observation-collection well, and Form OG107 is filed whenever an existing well is to be converted to an injection-withdrawal well or observation-collection well, even if no work is required. Specific requirements will be outlined in each well permit.
2. When an existing well is to be converted to injection-withdrawal or observation-collection, a test is conducted to demonstrate the mechanical integrity of the casing.
3. Mechanical-integrity tests for each injection-withdrawal well are run and filed with this Division within three (3) months after injection and/or withdrawal has commenced, and once a year thereafter; after any anomalous rate or pressure change; or as requested by the Division to confirm that stored gas is confined to the proper zone. The test data must be available for periodic inspection by Division personnel.
4. A Division approved pressure observation and withdrawal system is installed to monitor surrounding areas for storage gas accumulations. Data such as observed pressure and volumes of gas withdrawn shall be available at regularly scheduled meetings or upon request by this Division.
5. Any directional well drilled for use in this project has a directional survey run and the results submitted, in duplicate, to this office. A directional survey on any active well may be required by this Division.
6. All active, idle or abandoned wells that may be affected by this project are regularly and routinely monitored for surface gas emissions.

1986 -Significant alteration of originally approved conditions has occurred and was done without approval of DOGGR & the City of LA

W. Gourley, Agent
SOUTHERN CALIFORNIA GAS CO.
Playa del Rey Field

-2-

April 10, 1986
Updated July 23, 1986

7. Any remedial work in the project area necessary because of the gas storage operation on idle, abandoned, or active wells needed to protect life, health, property, and natural resources (including oil, gas, and freshwater zones) will be the responsibility of the project operator.
8. The gas storage reservoir pressure shall not exceed 1700 psi. Tests may be required to establish that no damage will occur from excessive injection pressures.
9. Monthly injection-withdrawal reports, by well, are filed with this Division listing the amount of gas injected, injection pressure, and amount of gas withdrawn.
10. All critical wells, as defined by this Division, have fail-close subsurface safety valves installed. A testing and inspection schedule must be submitted to, and approved by, this Division. (See Section 1720 of the California Administrative Code for the definition of a "critical well").
11. Surface pressures on each active or idle well are measured weekly with a calibrated test gauge, and recorded. Evidence of such measurement and calibration must be made available to this Division upon request.
12. The pressure rating of all injection piping, valves, and facilities shall meet or exceed the maximum anticipated injection pressures. This equipment shall be maintained in a safe condition.
13. Produced waste fluids are handled in a manner approved by this Division.
14. This office is notified of any anticipated changes in the project resulting in significant alteration of conditions originally approved, such as: an increase in size of the project; an increase in the approved zone pressure; changes in the injection-withdrawal intervals; changes in the observation-collection intervals; or monitoring procedures. Such changes must not be made without prior Division approval.
15. Annual project review meetings are held with representatives of this Division to review pertinent data and recent developments concerning this project. Data to be reviewed must include, but not be limited to: graphs of reservoir pressures; gas inventory fluctuations; injection pressure, and oil, gas, and water production by well; observation well data; reservoir fluid distribution; and temperature, radioactive tracer, and noise log surveys. Periodic update meeting shall be held to review specified topics as deemed necessary by this Division.
16. Upon request, the Division is provided with any other data deemed necessary to monitor the operations of the project properly.
17. Injection-withdrawal operations shall cease upon notification from this Division.

Sincerely,

for Verne F. Gaede
District Deputy
VFG:WEB:ee

ILLINOIS INSTITUTE OF TECHNOLOGY

TECHNOLOGY CENTER, CHICAGO 16

Department of Fire Protection and
Safety Engineering

March 18, 1955

AIR MAIL

Mr. John E. Roberts, Director
Department of City Planning
City of Los Angeles
361 City Hall
Los Angeles 12, California

Dear Mr. Roberts:

I have reviewed your letter of March 10, 1955, and although I feel that the information is very meager, I would like to express the following comments on the points which you raised.

1. The underground reservoir located at Herscher, Illinois has not had any effects on surrounding properties.
2. Probably the most important relationship of these reservoirs to the general welfare of the people is the fact that they provide a means of storing natural gas during the off-peak seasons.
3. I feel quite strongly that reservoirs of this type should be placed in a rural area and certainly would not recommend that they be located under a heavily populated district.

There was some question in my mind as to the type of underground gas storage reservoir to which you were referring. Here in the Chicago area gas is stored underground in two methods. The first is by means of large underground pipes into which gas is packed at 2200 pounds per square inch pressure. The second method is that used at Herscher where the gas is merely pumped underground into a natural dome-like underground structure at a relatively low pressure. The location at Herscher is in a farming area and the ground above the reservoir was purchased by the utility company. The farm land was then rented back to the farmers for their usage. There have been a number of problems which have arisen in connection with this reservoir, some of which involved the seepage of gas into old water wells. None of the problems, however, have resulted in explosions or any serious hazard to life or property.

I trust that the foregoing has been helpful to you. I feel that I might be able to be more helpful to you if I knew exactly what the nature of your underground reservoir will be when it is completed.

Very truly yours,

John J. Ahern, Director
Department of Fire Protection
and Safety Engineering

RECEIVE
CITY OF LOS ANGELES

MAR 21 1955

CITY PLANNING

Jobe
attach to file
JJA:fs

*Concerning Underground
Storage -*

WESTERN UNION
TELEGRAPH IT AND BE SURE
W. P. MARSHALL, PRESIDENT
LOS ANGELES

NO MISUNDERSTANDINGS
WHEN YOU HAVE A
RECORD OF IT

SYMBOLS
DL - Day Letter
NL - Night Letter
TL - Letter Telegram
VL - Victory Letter

(55)

The filing time shown in the date stamp is at point of origin. Time of receipt is STANDARD TIME at point of destination.

LA007 SSJ065 L-LLA053
(L-CA003) DL PD-CHICAGO ILL 10 857AMC
CARLETON BLOCKE
ROOM 361 CITY HALL DEPT OF CITY PLANNING LOSA
CLOSEST NATURAL GAS STORAGE INSTALLATION AT HERSCHER
ILLINOIS 80 MILES FROM CHICAGO IN ENTIRELY RURAL FARM
AREA. OUR INQUIRY LIMITED BY YOUR TIME REQUIREMENTS BUT
IT APPEARS LIKELY THAT SUCH USE WOULD BE CLASS 4 FIRE
USE PROHIBITED IN OUR BUILT UP AREAS. FOR FURTHER
INFORMATION SUGGEST YOU CONTACT JOHN AHERN OF ARMOUR
FOUNDATION HERE.
FREDERICK T ASCHMANN
Blocke
THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE.

LA City Plan Case 6162. The City of Chicago warned the City of Los Angeles of gas leakage to the surface and into the groundwater. HERE, Chicago Fire officials caution that the type of reservoir envisioned in LA would constitute a Class 4 Fire use and thus be prohibited in built up areas. The Herscher Field, set in rural Illinois had experienced gas leakage into water wells despite its low pressure operations. SCG's/PDR operations are typically, 1700 psi—high pressure operations.



A Sempra Energy utility

IMPORTANT INFORMATION ABOUT

Playa del Rey natural gas storage operations

Playa del Rey storage field overview

The Playa del Rey storage field was originally an oil field that produced during the 1930s. Following more than ten years of production, the pressure in the field dropped to a level that was less viable for oil production, but very suitable for natural gas storage. In 1942, the U.S. government initiated underground storage of natural gas as part of the war effort to ensure that a dependable source of energy was available. Pacific Lighting (a predecessor of The Gas CompanySM) operated the reservoir and purchased it in 1955. The Gas Company continues operating the field today - 65 years later.

The sandstone formation holding the gas is around 6,100 feet below ground level. This formation is covered by 1,500 feet of impermeable shale, sealing the porous storage area. We operate 54 active wells in order to inject and withdraw gas from the reservoir formation. Three

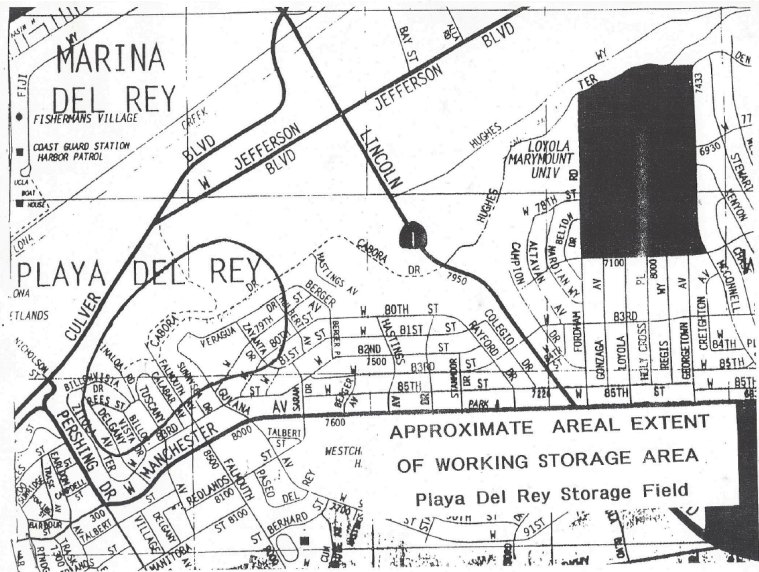


Aerial view of the Playa del Rey area. The blue line indicates the approximate boundaries of the "area of influence" of the operations of The Gas Company.

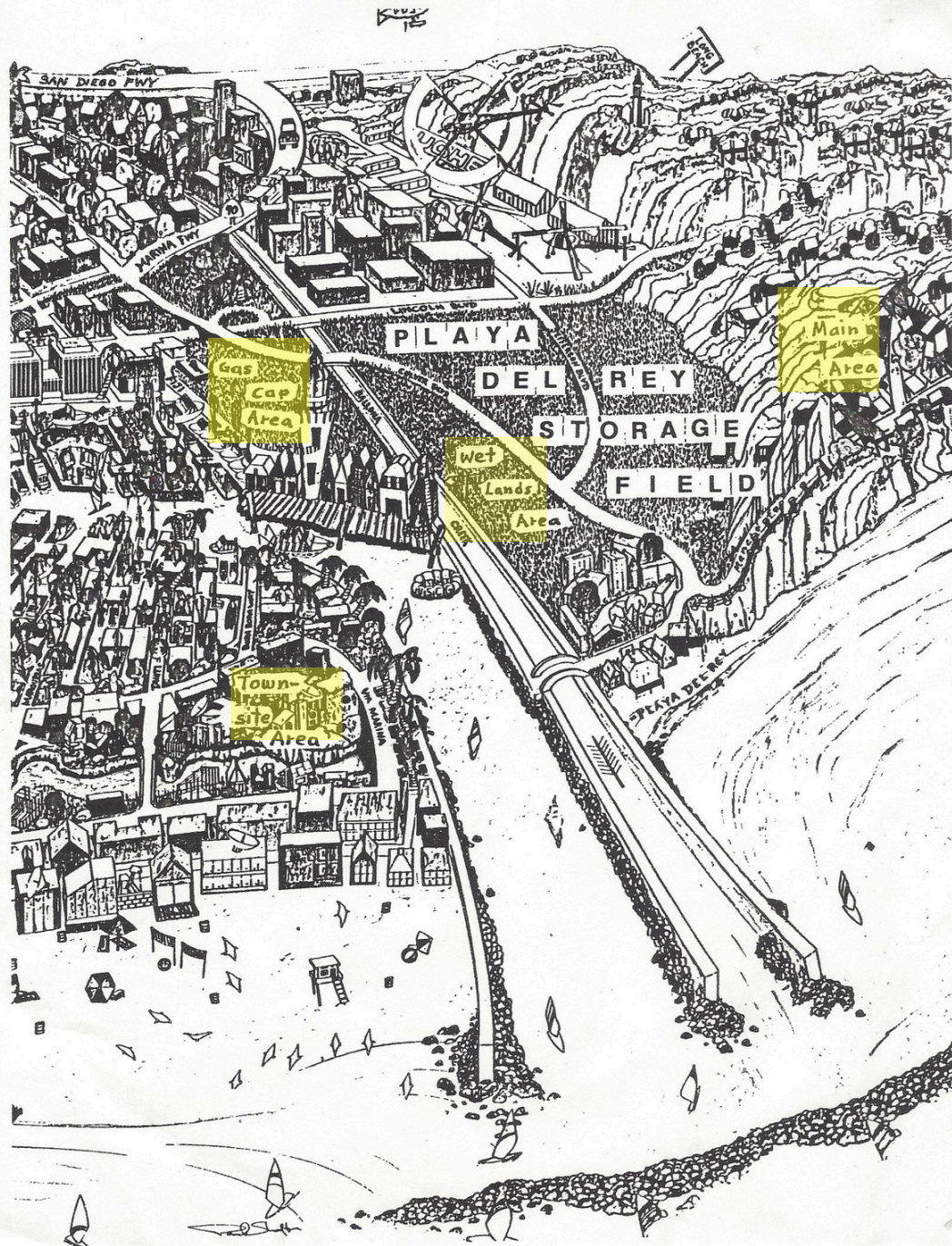
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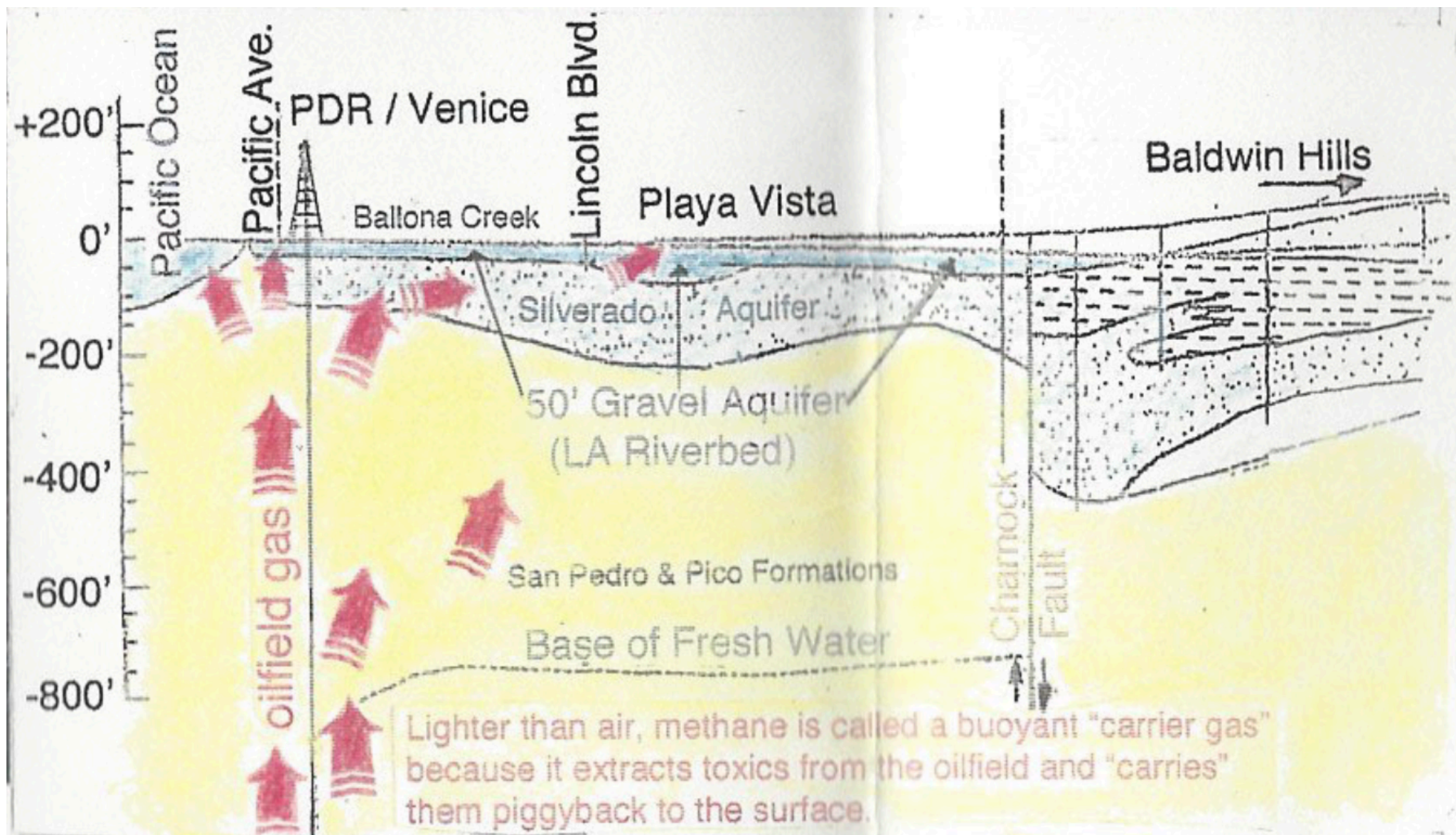
mailing because your home or business is located within the facility's "area of influence," defined as the geographical boundaries of our underground reservoir plus one-quarter mile in all directions.

The boundaries of the area of influence



SOCALGAS Company visual of multiple areas of their underground gas storage operations.





standards.¹ There would therefore be no buildings over or in proximity of abandoned wells. Letters received from the State Division of Oil, Gas and Geothermal Resources dated February 3, 1993, and from the Southern California Gas Company dated May 5, 1993 are presented in Appendix X-2, Volume XXI. Please also see Section I of the Final EIR, Corrections and Additions to the Draft EIR, No. 6.j; and Section II, Corrections and Additions to the Draft Program EIR No. 6.l.

False Statements by DOGGR IN 1993 EIR of Playa Vista

- Fairfax, Ross-Dress-For-Less explosion/fires from decomposing organic matter;
- No shallow zones of pockets of gas that can seep to the surface at Playa Vista

According to information received from the State Division of Oil, Gas and Geothermal Resources, an explosion in the Fairfax area, the City of Los Angeles formed a task force to study the cause of the explosion and probable source of the methane gas. The task force's study included a review of available geologic information on the Fairfax area, discussions with experts in the field of geophysics, a chemical analysis of the methane gas found at the explosion site, and a review of other pertinent information on the Fairfax area. The task force found that oil and gas seepage has been a common occurrence in the Fairfax area for thousands of years. Methane gas and oil currently exist at or near the surface in parts of the area, most notably the Rancho La Brea Tar Pits. Also, the most probable source of the methane gas was not an oil well, but rather decomposing organic matter near the surface. In addition, gas samples were taken at 781 locations in the Los Angeles Basin over an area of fifty square miles. The vast majority of the gas samples taken during the study were biogenic in origin.² A major geologic difference between the Fairfax area and the Playa Vista site is that, unlike the Fairfax area, the project site has no shallow zones and pockets of oil and shallow pockets of methane that can seep to the surface. The provisions contained in City Ordinance 161,552, Division 15 Methane Seepage District Regulations, which require a gas detection system, ventilation, and shielding between buildings being constructed and the earth, apply only to a specific area on the west side but can be invoked anywhere if the Building and Safety Department determines that a hazard exists.

¹ Mr. R.E. Corbaley, Environmental Supervisor, Division of Oil, Gas, and Geothermal Resources, State Department of Conservation, letter dated February 3, 1993.

² Mr. Corbaley, State Division of Oil and Gas, *Op Cit*.

ETI diagnoses widespread oilfield gas surfacing throughout the Ballona Wetlands and Playa Vista-2000

SUBSURFACE GEOCHEMICAL ASSESSMENT OF METHANE GAS OCCURRENCES

PLAYA VISTA DEVELOPMENT
First Phase Project
Los Angeles, California

Prepared for:
CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY

April 17, 2000

Report Prepared by:
Exploration Technologies, Inc.
3698 Westchase
Houston, Texas 77042

City of LA's independent gas expert Exploration Technologies Inc. verifies THERMOGENIC nature of Ballona region's high levels of outgassing in soils and water.

out by CDM and ENSR using the standard California Geoprobe method apparently resulted in the dilution of the soil gases (with the introduction of ambient air) collected and analyzed. In their two previous soil gas surveys, the largest methane reported by CDM was 970 ppmv. ETI's soil gas maps (ETI, 1999) show methane anomalies ranged upwards of 75 percent using ETI's methodology (Plate 2).

Measureable concentrations of ethane, propane, iso-butane, and normal-butane were also consistently detected/reported for the first time from Playa Vista soil gas samples using ETI's protocols. Concentrations for all four of these light gas components were noted to increase in a southwest direction. Ethane, propane and butanes are never found associated with 100% biogenic methane gas. These three independent light gases indicate a definite thermogenic gas contribution in the subsurface of this area. The gases become more thermogenic in composition to the southwest towards the University City Syndicate Inc. LTD #1 well, a possible source of thermogenic gas.

Analytical results from both free gas and dissolved gas collected from the five previously completed monitor wells in Track 03 also support the same interpretation derived from the soil gas data. The light gas compositions of the free and dissolved gases obtained from the water wells were found to be nearly identical to those measured at four feet in the soil gas samples. Even more important, the presence of ethane, propane and butanes confirmed the presence of thermogenic gases in the water wells.

Methane isotope analyses provide another independent method to identify and separate biogenic from thermal methane. Stable carbon isotopes analyses were performed on free gas samples collected from each of the five monitor wells in Track 03. Delta C-13 values generally decrease in a southwest direction, indicating an increased thermogenic contribution of methane gas in that direction. Results from the various independent media (soil gas, dissolved gas in ground water, and free gas bubbles) show the concentrations of methane and other light gases have a common source, which generally increases in a southwest direction from MW3.

The University City Syndicate Inc. LTD #1 well blewout while drilling at approximately 1800 feet. Natural gas liberated during the blowout of this well was suggested as a possible source of the thermogenic gas detected in the subsurface of Tract 03. In order to confirm this interpretation, it was necessary to conduct a more regional soil gas survey, followed by the installation of additional monitor wells in the 50-foot gravel aquifer.

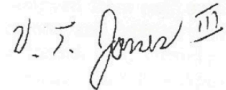
ETI- "There is no question that there is justification for conducting an investigation for casing leakage associated with the gas storage field."

well casings is to contain all fluids and gases, preventing cross-migration between different sands and protecting the fresh water aquifers. The admittance of this observation being common and observed over many years means that the interest of the public and the state of California is not being served. In short, this memo indicates that there are well casing leaks in the gas storage wells and that they are ignored until they affect the bottom line enough to be worked over and new tubing installed, or for the well to be abandoned.

There is no question that there is justification for conducting an investigation for casing leakage associated with the gas storage field. The most important samples to be collected next would be to sample the actual gases stored in the field and to conduct a soil gas survey around all of the wells in order to obtain a sample of the non-associated and undeveloped gas that is leaking from some of the gas company wells. A chemical and isotopic match between this gas and the gas measured on the Playa Vista site will only prove that these two gases have a common source. Additional work using soil gas and monitor wells will be required to establish a migration link between the gas storage field and the Playa Vista site.

If you have any questions, we will be pleased to provide additional details.

Sincerely,
EXPLORATION TECHNOLOGIES, INC.



Victor T. Jones, III, Ph.D.
Peer Reviewer for LADBS
President, Exploration Technologies, Inc.

City of LA's Gas Expert- Victor Jones/ ETI:

SCG admits as a "common occurrence"-
their well casings act as conduits for gas
to vent to the surface.



Exploration Technologies, Inc.

3698 Westchase Dr., Houston, TX 77042
Tel: (713) 785-0393, Fax: (713) 785-1550
E-mail: etimail@eti-geochemistry.com
http://www.eti-geochemistry.com

June 16, 2000

Mr. David Hsu
Chief, Grading Section
City of Los Angeles
Dept. of Building and Safety
201 North Figueroa Street
Los Angeles, CA 90012-2827

Dear David:

In regard to Michael Michalski's comment regarding resampling our 41, 50-foot gravel monitor wells installed in Tract 49104-01, 02, 03, 05 and 06 we have the following comment:

Our previous sampling protocol for our 41 monitor wells was comprehensive and included multiple and duplicate samples collected from multiple well volumes. The ground water was pumped at a fixed rate (approximately 1/2 gallon per minute) for several hours, removing between five to seven well volumes from each well. Both free gas bubbles and residual dissolved gas samples were collected from each well volume removed from each well. Multiple, representative samples were analyzed for both their chemical and carbon and hydrogen isotopic compositions. Excellent reproducibility was obtained on all samples analyzed. The chemical compositional data for each well was averaged and then plotted on the plates presented in ETI's April 17th, 2000 report. All of the data is also contained in our report for review. Inspection will show that the differences in the averaged data between wells is much larger than the differences in sample values measured within multiple volumes within each well.

This comprehensive sampling protocol was followed in order to provide very stable results, so that any resampling would be redundant, unless there were some fundamental changes in the actual quantity of gas within the aquifer. An earthquake or mitigation by man would be the type of intervention required to bring about a change in the amount of gas in the aquifer. It would be interesting to resample, from a scientific point of view, in order to further establish the natural variations that might exist within the aquifer. Our proposed monitoring system for the 50-foot gravel aquifer is based on establishing this natural variability and using this information to institute a long-term monitoring system as part of our proposed mitigation/monitoring system.

This measured compositional and isotope data is very stable. The only purpose for resampling at this time would be to establish variability for the future monitoring system. The basic result and conclusions regarding the gas storage reservoir will not be changed. The thermogenic gas found within the 50-foot gravel aquifer has very dry gas (very low ethane through butanes and no benzene or E₂S) and has a carbon isotope value (-56 to 60 parts per mil) that is very different from the values reported by Southern California Gas (the Vidor 12 well is reported to be -42 to 43 parts per mil). Based on this information, one has to conclude that the storage gas is not migrating to the surface at Tract 49104-01 and 03 where the large methane anomalies have been found by ETI.

There is, however, a possibility that the gas measured within Tract 49104 by ETI has migrated to the surface from shallow horizons around the well casings in the gas storage reservoir. On June 12, 2000 we submitted to B&S a workplan designed to evaluate this very real possibility. Attachment 2 of our workplan letter is an actual Southern California Gas Company document written by John Thompson to Jim Montgomery which proves that natural gases very similar to those found on the Playa Vista site are "venting" up the casings of some of their wells. This non-associated gas has never been developed commercially by the gas company (although they have recognized it's existence for many years), however, they do recognize that their well casings are conduits which this gas has followed in venting to the surface. Since the gas company has not injected this gas into the reservoir they have considered it as a nuisance and never reported it to the authorities. The DOGGR, however, should take a different view. The purpose of

The Gas Company

M. D. Middleton
General Superintendent
Santa Basin Division



February 1, 1993

Ms. Miriam Koral
Project Coordinator
Camp Dresser & McKee Inc.
1334 Third Street Promenade, Suite 201
Santa Monica, CA 90401-1310

Dear Ms. Koral:

Thank you for your letter of January 19. The Gas Company offers the following response to Earth Engineering's comment letter on the Playa Vista Draft Environmental Impact Report.

The Gas Company's Playa del Rey gas storage field has been operated successfully and safely for 50 years under the stringent scrutiny of the State of California Division of Oil and Gas. The gas storage reservoir is located over a mile beneath the surface in what at one time, back in 1942, was a depleted oil reservoir.

The Earth Engineering letter contains two major errors. The true facts and actual physical reality are:

- There is no vertical gas migration problem at Playa del Rey and the conjectured presence of large quantities of natural gas leaking from the Playa del Rey gas storage project is nonexistent.
- Storage gas does not contain a significant concentration of benzene or toluene.

The article, Gas Storage in the Playa del Rey Oil Field, written in 1953 by John Riegle describes unexpected migration of gas to the north and west. The gas migration was unexpected because the reservoir boundaries were originally thought to encompass an initial areal extent described in the report. Subsequent events in the period from 1942 to 1953 proved the areal extent of the reservoir to be larger than initially projected. Gas migrated laterally and pressured up the oil depleted outlying areas of the same continuous reservoir.

Realization of this lateral gas migration in the reservoir resulted in an operating strategy to recover the gas from the fringes of the reservoir. No gas was ever truly lost. No vertical gas migration to the surface has occurred.

- There is no vertical gas migration problem at Playa del Rey and the conjectured presence of large quantities of natural gas leaking from the Playa del Rey gas storage project is nonexistent.
- Storage gas does not contain a significant concentration of benzene or toluene.

Playa del Rey
California
90293-79

SCG/ Riegle study acknowledges gas migration outside the approved boundaries in 1953.

SCG acknowledges this to City of LA in 1993. Tells LA, no vertical gas migration to the surface has ever occurred.

SCG fails to tell City of LA that no expansion approvals were ever requested or garnered.

SCG fails to tell the City of LA, that the migration occurred due to SCG's decision to increase gas pressure and injection volumes.

THE PLAYA DEL REY

MONITORING PROGRAM

Rick Lorio
Associate Petroleum Engineer
Underground Storage
Southern California Gas Co.
April 25, 1985

LORIO 1985

"Storage Zone Problems - Possible source of gas migration to the surface

There are at least five different possible sources of gas to the surface at Playa del Rey"

I. Storage Zone Problems

A. Possible source of gas migration to surface

There are at least five different possible sources of gas to the surface at Playa del Rey:

1. Casing leaks due to tubing/drill pipe wear, corrosion, stage collars, squeeze holes or metal failure.
2. Casing shoe leaks in active and abandoned wells.
3. Leaks from lower to upper zones outside the casing through uncemented or poorly cemented well bore in either active or abandoned wells.
4. Abandonment plug leaks inside the casings of abandoned wells.
5. Wellhead seal leaks.

B. Three incidents of shallow casing leaks at Playa del Rey

Since Playa del Rey was converted to gas storage in 1942 for the war effort, there have been three incidents of shallow casing leaks. Two of these leaks had surface shows of gas and oil: 12-1 and 24-2, respectively.

1. In 1964, a casing leak was reported in Big Ben at about 150'. Repaired leak in 6-5/8" casing with Baash Ross casing bowl to 269'. The leak was determined to be at a depth of 269'.
2. On August 9, 1974, a gas leak was reported in the 13-1 block. The well 12-1 was determined to have a casing leak at between 700 and 800 feet. Bar hole surveys around the well and over the pipelines in the area indicated gas was appearing at the surface. The well was killed on August 15, 1974. From this time on, no gas was injected into the 13-1 block.
3. On April 30, 1975 at about 11:00 a.m., oil and gas surfaced on the east side of cellar wall. The well was producing through a leak in 7" casing at an unknown depth. They found corrosion in the

Casing leaks

Casing shoe leaks

Leaks from lower to upper zones outside the casing

Abandonment plug leaks inside the casings of abandoned wells

Wellhead seal leaks

24-1 Fault Block

This fault block is used in tandem with the main storage area. It has no other purpose other than to remove fluid from this east flank.

Del Rey Main Area

This is the storage zone area. The operating guidelines are to withdraw from low structure wells first and work towards the higher structures. There are twenty-eight injection/withdrawal wells located in this area.

Del Rey Gas Cap

The wells located in this area of the field are primarily used for observation. Two of these wells are also used for gas migration return Del Rey 15 and Del Rey 18.

Venice Townlot Area

The wells in this area have a dual purpose: pressure relief (fluid removal) and gas migration (observation).

Early in the usage of Playa del Rey as a gas storage reservoir, it was discovered that certain oil productive areas, previously considered to be structurally separate deposits were really pressure connected. The areas in question were the Del Rey Gas Cap, Del Rey Hills Area, Del Rey Main Area and the Venice Townlot area. Parts of this reservoir are apparently geologically connected but not pressure connected.

Block 10R, Block 11, Townsite 2, Townsite 3, Townsite 11 and Troxel are located in this part of the field. Troxel, however, is on the other side of a fault block. Helium tests have indicated storage gas production from this area of the field.

1. MICHAEL D. MIDDLETON

BACKGROUND: As of October 1993, Mr. Middleton's title was:

General Superintendent
South Basin Division Transmission
Southern California Gas Company
8141 Gulana Avenue
Playa Del Rey, CA 90293-7930

In 1993 Mr. Middleton was responsible for communications between the Gas Company and the City of Los Angeles Planning Department regarding safety aspects of the Playa Del Rey facility. For example, the following representations were made by him in a letter dated May 5, 1993 from the Gas Company to Mr. Richard Takase, Los Angeles City Planning Department: (Emphasis added.)

- (1) "There is no vertical gas migration from the SOCALGAS storage field."
- (2) "Storage gas, and all petroleum products, may contain Benzene and Toluene, but the amounts are very small."
- (3) "Some natural gas contains no Benzene; the most Benzene we have normally found is 40 parts per million."
- (4) "Benzene and Toluene occur naturally in natural gas and are not added by our operations."
- (5) "SOCALGAS's Playa Del Rey Gas Storage Field has been operated successfully and safely for 50 years under the stringent scrutiny of the State of California Division of Oil and Gas."
- (6) "In short, the fear of gas migration from the SOCALGAS Storage Field is substantiated by only speculation."
- (7) "SOCALGAS, on the other hand, can offer evidence that migration from the storage field does not occur."
- (8) "SOCALGAS actively monitors the reservoir, as well as active and abandoned wells, to ensure that there is no gas migration from the storage field."
- (9) "Surveys are run in our wells and the volumes of gas injected and withdrawn are carefully measured."
- (10) "Monitoring of surface barholes also demonstrates tha gas has not migrated from the storage field to the surface over the years."
- (11) "SOCALGAS has no control over the ability of individuals to construct residences over abandoned wells."

Bernard Endres Phd Oilfield Gas Expert OUTLINE of:

Statements made
to the City of LA by
SOCALGAS & the
Division of Oil &
Gas & Geothermal
Resources (DOGGR)
regarding the
Playa del Rey
underground gas
storage operations.

These statements
are inconsistent
with the truth as
demonstrated by
SOCALGAS internal
memos, reports...

2. CLAUS LANGER

BACKGROUND: Superintendent and Operations Manager at a number of the Gas Company's Underground Storage Facilities throughout Southern California since 1989. This included the positions of Storage Superintendent and Storage Operations Manager at the Playa Del Rey Storage Facility between 1992 and 1997.

Mr. Langer was in charge of the Playa Del Rey Facility during the time period that many odor complaints were made by residents of the bluff area. He was responsible for orchestrating a campaign to downplay any safety hazards associated with the facility, including venting of gas from the tank farm and from wells during blowdown operations.

Mr. Langer coordinated a response with the State Division of Oil, Gas and Geothermal Resources (DOG), to the Los Angeles City Planning Department in 1993.

In a February 3, 1993 letter from the DOG to the Los Angeles City Planning Department (Mr. Richard Takase, City Planner) the following claims are made by the DOG (R. E. Corbaley, Environmental Supervisor):

- (1) "Furthermore, there is no known problem with migration into zones overlying the gas storage zone."
- (2) "There is no documented evidence that these abandoned wells act as conduits for gas migration to the surface."
- (3) Following the Fairfax incident, the City of Los Angeles formed a Task Force to study the cause of the explosion and probable source of the Methane gas. ... The Task Force also found that the most probable source of the Methane gas was not an oil well, but rather decomposing organic matter nearer the surface.

In an October 5, 1993 letter from the City of Los Angeles Planning Department (Richard M. Takase, City Planner) to SOCALGASCO (Michael D. Middleton) the following role of Claus Langer is identified:

- (1) "We would also like to thank Claus Langer of your division for appearing at the City Council's September 21, 1993 Public Hearing on this same matter in connection with the Appeal from the Planning Commission's approval of the pertinent tract map for the Playa Vista First Phase."
- (2) "On behalf of the City Planning Department, I wish to belatedly thank you for providing the City with the information given in your letter of May 5, 1993 relative to the alleged potential for migration of natural gas to the surface from the Gas Company's Underground Natural Gas Storage Facility in the Playa Vista area."

letterhead: Southern California Gas Company, Engineering Analysis Center) information is provided regarding "some Benzene data in Gas at producers." The information on Benzene levels is titled "(Table Five) South Basin Division Pipeline Gas Analysis" and contains the following tabulated data:

LOCATION	DATE	BENZENE (PPM)	GAS FLOW* (MCF/DAY)	GAS PRESSURE (PSIA)
Grainer (4006)	12/3/91	139	NR	97
Grainer (4006)	12/3/91	137	NR	97
Blackhawk (2819)	12/3/91	207	NR	42
Blackhawk (2819)	12/3/91	236	NR	42
Brea (2818)	12/3/91	563	NR	2
Brea (2818)	12/3/91	565	NR	2
Sawtell (5719)	5/5/92	27	191	177
Brea Canyon (3820)	5/5/92	45	1793	75
Union (POR-10)	5/5/92	134	1382	170
Tap For Odor Check (Near Union)	5/15/92	127	NR	40

*NR = Not Recovered.

It should be noted that the information contained in the above two sources directly contradicts the representations made by high level people within the Gas Company. For example, compare the following statement made by Michael D. Middleton to the Los Angeles City Planning Department in a letter dated May 5, 1993 (see description under paragraph 1. under "MIDDLETON" above:

"Some Natural Gas contains no Benzene; the most Benzene we have normally found is 40 parts per million." (Emphasis added.)

The above tabulated data measured by the Gas Company in 1991 and 1992 revealed that only one of ten samples had a Benzene level less than 40 parts per million. Most of the other samples tested were well above 40 parts per million, with one sample testing at 565 parts per million.

SCG Table on the left contradicts the representation made by high level people within SCG,

"Some Natural Gas contains no Benzene; the most Benzene we have normally found is 40 parts per million."
Michael D. Middleton to LA City Planning 1993

SCG/Playa del Rey benzene data also reveals high benzene levels.

Benzene

INTEROFFICE

CORRESPONDENCE



TO Mr. P. S. Magruder, Jr. FROM B. F. Jones DATE August 7, 1975
SUBJECT Playa del Rey - Gas Migration

Action Plan:

Try and pinpoint the source of migrated Playa del Rey stored gas by running sound logs on 14 wells which have temperature anomalies of 3° or more from the normal gradient. Radioactive tracer surveys will be run on wells which show high frequency sound anomalies. The estimated cost of this program is \$40,000. In accordance with our discussion, we will accumulate these costs under a miscellaneous work order. We will try and start sound survey work during the week of August 18, 1975. I told Mr. John Brady of our plans this afternoon, and he said we should proceed with the work.

Discussion:

The following summarizes discussions that Jack Hampton, Jeevan Anand and I had July 31, 1975 relating to the Playa del Rey gas migration problem. This discussion resulted in the above plan of action. As you know, we have some very small volumes of stored gas coming to the surface around the cellar of Del Rey 17. We have also had reports this year of gas containing helium present in the surface casing annulus of 26 wells. This information was summarized by John Melton in his letter to me dated February 26, 1975 (attached). A re-survey of surface casing annular gas in May 1975 found gas with traces of helium present in 16 wells. Within the last year, temperature surveys have been made on 53 of the 69 wells. Forty-one of these surveys were made in 1975. Twelve surveys are scheduled to complete this program. Sixteen wells had temperature anomaly varying 3° or more from the normal gradient. A total of six sound logs have been run within the last two years. Three of them were run this year. The only sound log that show a definite hole in the casing was that made on the well Playa del Rey 12-1. Sound logs run in Del Rey 17 and 18 indicated shallow (above 1000') low-cut noises. This is interpreted to represent gas movement outside of the casing. A temperature survey made on Del Rey 18 in June of this year is significantly different than the survey ran in September 1974, suggesting that the well may now be leaking.

The Del Rey wells can generally be grouped as either wells in the flat area or wells in the bluff area. Wells in the flat area are very close to sea level and all except the top 8-10 feet of the casing should be covered by ground water. Wells in the bluff area are those wells where the wellhead is at least 8-10 feet up to 150 feet above sea level. All wells are subject to tidal fluctuation which would

Mr. P. S. Magruder, Jr.

- 2 -

August 7, 1975

possibly cause a wetting and drying of the casing near sea level. Four wells in the bluff area have developed shallow casing leaks, three of the leaks were near sea level, and probably due to casing corrosion. The first of these three was Big Ben #1 which was repaired in 1964. The second was 12-1 which occurred in August 14, 1974 and the third was 24-2 which occurred April 30, 1975.

The area where storage gas is currently surfacing is in the flat area. Sound logs suggest gas movement from a depth of about 1000' below sea level. The temperature anomaly in Del Rey 18 is approximately 1100' below sea level. It seems reasonable to re-survey this well using a sound log as soon as possible. Next, it would seem prudent to survey with a sound log all wells with a temperature deviation of 3° or more from gradient. Any well which shows a high frequency sound anomaly should have the potential leak evaluated using a radioactive tracer survey.

Cost of running at least 14 sound logs is estimated to be \$2,000 per well or \$28,000 for the sound log program. If sound anomalies were found on five wells, an additional \$10,000 should be allowed for radioactive tracer surveys. \$2,000 contingency allowance would bring the estimated total cost of this migration study up to \$40,000. It is our opinion that this study should be undertaken this year in order to evaluate the Playa del Rey gas migration problem.

BFJ:eo
Attachment

cc: Messrs. J. P. Anand
H. C. Carson
J. D. Hampton
A. S. Olson
D. Wood

Also filed in Playa del Rey Misc. Correspondence

**SCG Inter-Office Correspondence acknowledges
RESERVOIR GAS SURFACING in the flats, the bluffs
and north of the Ballona Channel—Del Rey 17**

**SCG Marker— HELIUM
present in surface
casings of 26 wells**

INTEROFFICE



CORRESPONDENCE

PDC 1103
cc TS.
MEN
feh

TO M. Melton

FROM

L. L. Langer

DATE 6-20-80

SUBJECT Gas Migration to Venice Peninsula Area from Playa Del Rey Storage Area

Last summer, Theodoros did a study with Jeevan concerning the migration of gas from the storage area here to the Del Rey Gas Cap and Venice Peninsula (Marina) areas. It is my understanding, at this time, that Theodoros' study showed that little if any migration has taken place. This does not agree with early conclusions in this regard as stated by John Riegler in the attached paper. At this time it is very important that we try to reach a consensus on this issue. I would appreciate it if Theodoros' study could be finalized; maybe with some input from Dr. Katz so that we can be aware of what our operating policy in the Venice Peninsula area should be. Are we there as good neighbors, preventing water encroachment/ pressure buildup in the old Townlot Field or are we in fact remedying a problem of our own creation pressure build-up due to gas migration?

LLL:ldh

cc: B. F. Jones
P. S. Magruder

SCG- "Are we there as good neighbors, preventing water encroachment/ pressure buildup in the old Townlot Field or are we in fact remedying a problem of our own creation...pressure build-up due to gas migration?"

AGENDA FOR ANNUAL REVIEW MEETING WITH
DIVISION OF OIL AND GAS FOR PLAYA DEL REY,
MONTEBELLO AND EAST WHITTIER FIELDS
June 7, 1983

Attending:

E. Brannon, Division of Oil and Gas
C. M. Goldwasser
J. W. Gourley
D. Lande, Division of Oil and Gas
L. L. Langer
P. S. Magruder, Jr.
K. M. Taira
R. E. Wallace

Playa del Rey

Project Performance - No unusual or unpredicted occurrences. Maximum injection pressures range from 1400 psi to 1700 psi wellhead. Discovery pressure was 2750 psi bottomhole. Plot of annual rate of oil produced vs. cumulative oil attached. Explanation of basic usage of reservoir provided by Mr. Goldwasser.

Conservation - No losses detected. Documentation of monitoring system presented by Mr. Goldwasser.

Pollution Prevention - Status of subsurface safety valve installations: 1. All wells but So. Cal. 1 will be completed this year. 2. Discussion of "Conditions for Operating Critical Wells Without Subsurface Safety Valves" with regard to extension granted for So. Cal. 1 - Mr. Gourley. Presentation on Testing of Safety Systems, Water Disposal, and Spill Prevention - Mr. Goldwasser.

Operations - One leak found and repaired at Del Rey 18 and two subsurface safety valves failed at 24-2 and 27-1 and have been replaced. Del Rey 18 was typical of shoe leaks at Playa del Rey in that the storage zone was being dump flooded from above in this well. A W.S.O. was reestablished on the production casing shoe.

Geology and Engineering - Reservoir simulation study in progress. One of new wells to be drilled this year will be cored.

East Whittier

Project Performance - No unusual or unpredicted occurrences. Presentation on normal and summer usage of field by Mr. Wallace.

Conservation - No losses detected. Monitoring program is similar to that used at Playa del Rey and Montebello.

Pollution Prevention - All critical wells protected. No oil production. No waste water disposal problems.

SCG / DOGGR Meeting 1983 – discussion of Del Rey 18 Shoe leakage (next to Fisherman's Village) and well leaks in the bluff area. Del Rey 18 has a long history of leakage, there are numerous neighbor complaints of odors and ill health.

ENGINEERING ANALYSIS CENTER REPORT

PROJECT NUMBER: EA95-C7-4
 REPORTED BY: L.N. McGinnis
 REPORT DATE: 3-10-95

REQUEST: Monthly Helium Analyses for Wells and Barholes at Playa del Rey.

REQUESTED BY: Steve Cardiff Mail Location: 9850
 DIVISION/DEPT: SOUTHERN REGION Request Date: 3-6-95

WELL	HELIUM CONTENT		REMARKS
	ppm	* Gas Percentage	
So. Cal # 2	104	70%	
So. Cal # 4	71	100%	
Trap 133	164	100%	
Dunlap	123	40%	
Fast	23	100%	
Vidor 18	13	100%	
Harlan	10	100%	
DR10 - Casing	23	75%	
DR10 - BH # 1	130	20%	
DR10 - BH # 2	52	44%	
DR10 - BH # 3	—	1.6%	insufficient combustible sample

* (ppm values adjusted to 100% combustibles except where total combustibles are less than 8.0%)

Analyzed By: L.N. McGinnis

Approved By: Shahid Razzah

cc: PDR Field Engineer, ML 22GO

Helium levels north of Ballona Channel in Mariner's Village at Del Rey 10 –BARHOLES.. placed in surface soils surrounding the well.

Indicating reservoir gas leakage to the surface within this residential complex.

BH = Bar hole

SCG says that no vertical gas migration occurs but these SCG Correspondences demonstrate that SCG knows those statements are false.

DATE: March 22, 2000
TO: J. Mansdorfer
FROM: J. A. Thompson
SUBJECT: Subsurface gas well leaks at PDR

The following is a summary of the results of my research of the Playa Del Rey well files.
Referenced attachments are in (bold).

1. Well #29-1 1959 Discovered stage collar leak at 723' during routine temperature survey. Well worked over to install casing bowl. (1)
2. Big Ben #1 1964 Discovered production casing leak at 150'. Well worked over to install casing bowl. (1)
3. Blackline #1 1969 Discovered casing leak at 1064'. Repaired with casing patch. (1)
4. SoCal #4 1971 Found leak at 3216' during routine temperature survey. Well worked over to squeeze cement for repairs. (1)
5. Well #12-1 1974 Surface seepage discovered. Leak at 481' was repaired with casing bowl installation. (1) (2)
6. SoCal #3 1975 Found leaks at 3300' during routine temperature surveys. Well worked over and repaired with cement squeezes (1) (3)
7. Well #24-2 1975 Surface seepage discovered. Leak at 191' was repaired with casing bowl installation. (1)
8. Pomoc #1 1975 Found leak at 2815' during routine temperature survey. Well worked over to squeeze cement for repairs. (1)
9. SoCal #3 1978 Wireline work revealed holes at 2109'. Installed inner casing. (3)
10. Well #12-1 1979 Temperature survey revealed leak at 210'. Casing patch installed. (4)
11. Blackline #1 1986 Casing patch failure detected from routine temperature survey. Inner casing string installed. (5)
12. Joyce #1 1987 Casing gas identified as storage gas. Noise log detects hole at 750'. (6)
13. Big Ben #1 1991 Surface seepage discovered. Well abandoned. (7)

Stadish v. So. Cal. Gas Co.
BC 126952
Def. Exh. No: 2042
Admitted On:

Rec'd
copy
made
9/17/76



TO: Mr. P. S. Magruder FROM: J. D. Hampton DATE: September 16, 1976
SUBJECT: Well Casing Leak History - Playa del Rey Field

Shown below are wells in the Playa del Rey field which have required casing leak repairs in the past:

- 10-59 - Well 29-1 - Found stage collar leak at 723'. Repaired by cutting casing and running new pipe on a casing bowl.
- 8-64 - Big Ben 1 - Found leak at 150'. Repaired by cutting casing and running new pipe on a casing bowl.
- 7-69 - Blackline 1 - Found leak in casing at 1064'. Repaired with a Lynes casing patch.
- 4-71 - SoCal 4 - Found casing leak at 3216'. Repaired by squeezing cement.
- 12-72 - SoCal 3 - Found leaks above and below 3300' with temperature surveys. Repaired by squeezing cement and installing a scab.
- 8-74 - Well 12-1 - Leak was discovered by flame ionization gas detector. Repair was made by splicing new casing with a casing bowl at 481'.
- 4-75 - Well 24-2 - Gas surfaced outside the well cellar. Repaired by splicing new casing with a casing bowl at 191'.
- 9-75 - Pomoc 1 - Found leak at 2815' with temperature, noise and tracer surveys. Leak was repaired by squeezing cement and installing a scab.

JDH/ww
cc: Mr. B. F. Jones
Mr. A. S. Olson ✓

Troxel is north of what was thought another natural barrier...a fault. Reservoir gas migration found at this well, signals reservoir gas migration beyond any monitoring well of SCG. Migration into Venice and MDR is already a concern due to all the old wells that can and do act as conduits for gas to surface. Hundreds of old wells are safety threats throughout this area.

INTEROFFICE

SOUTHERN CALIFORNIA

gas

COMPANY

CORRESPONDENCE

File

TO

Mrs. Shahed Meshkati

FROM

E. S. Sinclair

E. S. Sinclair

DATE

March 27, 1987

SUBJECT

Storage Gas Migration to Well Troxel

Conclusion

Higher than normal helium concentration and gas production were recorded at Troxel during shut-in of Del Rey 10, 15 and 18 in 1986. Although the abnormal helium and gas concentrations are not enough evidence to conclusively state that there is gas migration to Troxel, they certainly are good indications.

Based on the above information, I think monitoring of gas migration to the townsite area (including Troxel) should be reviewed for effectiveness to prevent high pressure gas from migrating beyond our controlled areas. The monitoring program should also be structured to detect and determine whether there is continuous migration, intermittent migration or any migration at all to Troxel.

Background

From talking with people who are familiar with the Playa del Rey reservoir history, it appears the common belief is that Troxel is not contiguous to any section of the storage field, and therefore, there is no communication between Troxel and the main storage field. Instead, it is used to create a pressure sink and to collect gas and liquids in the Marina beach area, fluids which would otherwise probably show up in old abandoned wells which are scattered throughout the area. A recent geological study of the Playa del Rey storage filed, By Richard L. Hester, was not able to clearly agree or disagree with the common belief.

Consultants Stanley and Stolz in 1958 submitted an engineering study to the Company which discussed gas migration to the Marina Townlot Wells. They discovered that Del Rey 18 was very effective in reducing the migration gas reaching the townlot wells (which at that time were; Davidson 4, Blocks 10R and 11, and Townsite 2 and 11). They also discovered that during the winter season when more gas was injected into the main storage area, the migration gas to the townlot wells seemed to increase. Based on their observation, Stanley and Stolz recommended that the Gas Company acquire complete control of the above mentioned townlot wells.

A subsequent report which was published in 1961 by the same consultants addressed the acquisition of Troxel #1. They stated that with the acquisition of the townlot wells, the former migration problem appeared to be under control. The consultants further stated that although helium traces indicating storage gas were never evident and that faulting might separate Troxel from the Company's holding, Troxel should not be placed in an unimportant category. They said it would fit nicely into Company operations and would be excellent for observation purposes. Stanley and Stolz later recommended that the Company acquire Troxel #1.

Storage Gas Migration to Well Troxel
E. S. Sinclair
March 20, 1987
Page Two

Recent Observation

During parts of November and December of 1986, migration gas collection wells Del Rey 10 and 18 were shut-in for several weeks. Del Rey 18 was shut-in because of different maintenance problems, while Del Rey 10 was accidentally left shut-in. Del Rey 15 which is generally put on withdrawal as an alternate, if Del Rey 18 is expected to be shut-in for more than two days, and concurrently with Del Rey 18 if the field pressure is above 1250 psig. was not put on production during this time. The Playa del Rey field pressure is usually below 1250 psig., and therefore, significant variations in migration gas might not be observed until the pressure increases beyond 1250 psig. During November 1986, average field pressure was close to 1250 psig. which might explain the high helium and gas production in Troxel.

During the November/December 1986 shut-in of the two gas cap wells, Del Rey 15 and 18 and Well Del Rey 10, significant pressure increase was observed at Del Rey 10 (see fig. 1) During this time period, a gas sample was taken at Troxel and analyzed for helium. The gas analysis showed a higher helium content than is usual at this well. Helium analysis at Troxel in November 1984 and May 1986 showed 15 ppm and 20 ppm respectively, while analysis in December 1986 showed 84 ppm. Gas production at Troxel also doubled during the said two months November and December of 1986 and returned to normal production January 1987, after the Del Rey gas cap wells and Del Rey 10 were returned to normal operation. If these increases are due to migrated gas, more precaution will be needed to prevent high pressure migration gas from entering into this sensitive townlot area, thus the following recommendations.

Recommendation to Underground Storage Staff

I recommend that:

- Monitoring of gas migration to the townsite area (including Troxel) be reviewed for effectiveness.
- The monitoring program be structured to determine the extent of gas migration to Troxel, if any.
- Well Del Rey 19 condition be investigated, and that necessary modifications be made to put the well on production. Based on Hester's Geological Study, Del Rey 19 will be a more useful migration gas return well than Del Rey 15, since it intersects the migration path.

Below is an action plan that the Division should follow in order to minimize gas migration to Troxel, and also to better understand the problem.

Storage Gas Migration to Well Troxel
E. S. Sinclair
March 20, 1987
Page Three

Division Action Plan

- Concurrently produce Del Rey 15 and 18 at all field pressures.
- Make special efforts to keep all Marina (townlots) wells on production at all times.
- Continue to vent the casing at Del Rey 10 in the Marina low pressure system.
- Compare monthly gas production from all townlot wells with average monthly main storage area field pressure.
- Analyze gas sample from Troxel for helium as required, if main storage area field pressure increases above 1250 psig. and remains at that pressure for more than three days.

Plans 1 and 2 are subject to limitations on liquid discharge to the Sanitation District. The current priority list for gas lift wells should be used in the event of excess liquid production. Each plan will only be in effect as long as it is necessary and proves to enhance understanding of the problem.

Please let me know if the above action steps are adequate and appropriate.

ESS:dt

Attachment

cc: J. P. Anand
J. H. Joslin
J. F. Tierney
R. W. Weibel
D. Zuniga

The public has a right to know what gas migration is happening underneath their homes and what is being done to prevent that gas from surfacing into their homes and the environment.

SCG acknowledges its active wells leaking gas to the surface

APPENDIX F

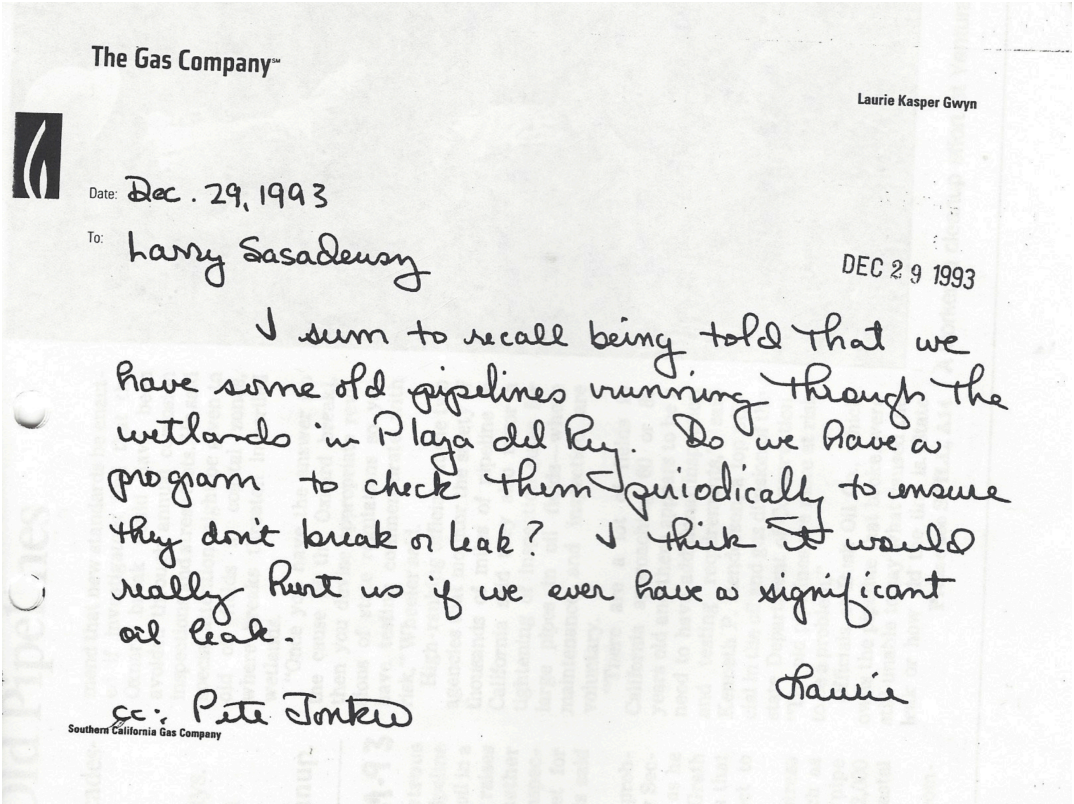
HAZARDS AND HAZARDOUS MATERIALS BACKGROUND INFORMATION

TABLE F-1
SUMMARY OF DETECTED GAS LEAK

Well Name	Problem	Depth (ft bgs)	Year Detected	Well Location
Well No. 29-1	Stage collar leak	723	1959	Between Falmouth Ave. & Calabar Ave., south of intersection with Cabora Dr.
Big Ben No. 1	Casing leak	150	1964	Between 79th St. & Veraqua Dr., northeast Zayenta Dr.
	Surface seepage		1991	
Blackline No. 1	Casing leak	1,064	1969	South of Cabora Dr., west of Veraqua Dr. and Zayenta Dr. intersection
	Casing leak	1,060	1986	
SoCal No. 4	Casing leak	3,216	1971	NW of Cabora Dr., about 1,000 ft. NE of intersection with Falmouth Ave.*
SoCal No. 3	Casing leak	3,300	1972	NW of Cabora Dr., about 1,000 ft. NE of intersection with Falmouth Ave.*
	Casing leak	3,300	1975	
	Casing leak	2,109	1977	
Well No. 12-1	Surface seepage	481	1974	Southeast of 81st St., north of intersection with 83rd St.
	Casing leak	210	1979	
Well No. 24-2	Surface seepage	191	1975	Northwest of 79th St., west of Zayanta Dr.
Pomoc No. 1	Casing leak	2,815	1975	West of Zayanta Dr., between 79th St and Cabora Dr.
Joyce No. 1	Casing leak	750	1987	Northwest of 82nd St., east of Saran Dr.
Lor Mar No. 1	Casing leak	720	1981	South of 83rd St., east of Saran Dr.

* Surface location of directionally drilled well. Bottom hole locations were not made available.

SOURCE: (DOGGR, various dates)



In 2004, SCG oil/gas line leaks on Mindanou Way. SCG cites it as condensate leakage. HazMat is called in for cleanup.

MARINER'S VILLAGE-Reservoir gas surfacing into community

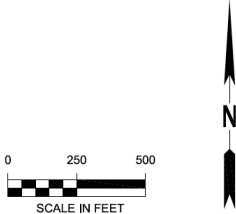
Fisherman's Village

EXPLANATION

- SOIL VAPOR SAMPLING LOCATION

ALL CONCENTRATIONS IN ppmv (PARTS PER MILLION VOLUME).

High levels of reservoir outgassing leads to shut down of SCG operations during DOGGR investigation in 2010.



URS Corporation

SOIL VAPOR SAMPLING LOCATIONS AND METHANE CONCENTRATIONS >25,000 ppmv

Proj. No.: 29868671	Date: AUGUST 2009
Project: Southern California Gas Company Playa del Rey Storage Facility	Figure: 3

SOCALGAS UNDERGROUND GAS STORAGE OPERATIONS

Playa del Rey

SCG Attorney COMMUNICATIONS Regarding Potential Liabilities for Abandonment of Troxel well.

(This most northern monitoring well was part of the land sales SCG undertook.)

What monitoring information exists that demonstrate the Venice and MDR communities, overlying SCG operations north of Ballona Channel, are safe from the hazards of SCG’s migrating gases and pressures?

Interoffice Memorandum

Pacific Enterprises

2C/CPUC exhibit

PRIVILEGED AND CONFIDENTIAL
ATTORNEY-CLIENT
COMMUNICATION
ATTORNEY WORK PRODUCT

Date: February 14, 1991

Subject: Abandonment of Troxel Well - Playa del Rey

From: N. J. Provost

To: R. D. Phillips

SoCalGas currently operates the Troxel Well in the Playa del Rey Field. You have asked for a legal opinion outlining SoCalGas’ potential liabilities if the planned abandonment of such well is implemented.

As I understand the facts, currently due to production from such well, the bottom hole pressure in the producing zone is less than hydrostatic pressure. However, following abandonment it is expected that the pressure in the producing zone will return to the hydrostatic pressure, producing a water-drive mechanism which, in theory (no one knows for sure), might produce hydrocarbons (and/or water?) through adjacent wells previously abandoned by third parties. Based on thirty year's experience SoCalGas is now convinced that a fault -- effectively preventing migration -- separates the Troxell Well from SoCalGas' other Playa del Rey operations, so that SoCalGas' other Playa del Rey operations will have no impact on this portion of the Field. Therefore, any possible hydrocarbons or water escaping at surface locations will occur solely through wells that are not "properly abandoned," as by definition, a "properly abandoned" well effectively seals off hydrocarbons and water. My understanding is that SoCalGas has never owned or operated any well in this area other than the Troxel Well (and has no specific information on their abandonment). No known leakage is occurring currently at any abandoned well location. Finally, this memo is based on the assumption that the build up to hydrostatic pressure is purely a natural phenomena, and the existence of the Troxel Well is currently "artificially" preventing such natural occurrence (as all other production has been abandoned on the Troxel Well side of the fault).

- 2 -

Since the early days of the oil industry the various oil-producing states have enacted legislation requiring the "proper abandonment" of wells no longer capable of producing oil and gas in paying quantities. See generally, Annot., "Duty and Liability as to Plugging Oil or Gas Well Abandoned or Taken Out of Production," 50 ALR 3d 240 (1973).

In California the obligation to "properly abandon" is established in California Public Resources Code, and specifically in §3208, which states in part:

"A well is properly abandoned when it has been shown, to the satisfaction of the [State Oil and Gas Supervisor], that all proper steps have been taken to isolate all oil-bearing or gas-bearing strata encountered in the well, and to protect underground or surface water suitable for irrigation or farm or domestic purposes from the infiltration or addition of any detrimental substance and to prevent subsequent damage to life, health, property, and other resources."

See also §3228 requiring "isolation" of oil-bearing or gas-bearing strata and "every effort and endeavor to protect" water from pollution. Under certain circumstances related to future construction of overlaying structures (§3208.1) or "hazardous wells" (§3250 et seq.), the Supervisor can require "reabandonment," but this does not apply to an operator which has "properly abandoned" the well (it applies to the surface owner). Completing an abandonment contrary to the methods agreed upon constitutes "sufficient grounds for the methods [Supervisor's] disapproval of the abandonment" (§3232).

Unfortunately, there are no California cases interpreting these statutes which shed further light on the facts related to the Troxel Well. The phrase "subsequent damage to life, health, property, and other resources" has not been discussed in any California abandonment case. In fact, the existing California cases seemed to be limited to determining whether or not abandonment has, in fact, occurred. See e.g., Banks v. Calstar Petroleum Co. 82 CA2d 789 (1947).

Relevant cases outside California are also sparse, but based on an examination of the limited materials available, it appears that the following legal principles should apply:

1. There must be a causal connection between the damage claimed and the abandonment well in question. Shell Petroleum Corp. v. Blubaugh, 102 P2d 163 (Okla. 1940) and Shell Petroleum Corp. v. Blubaugh, 185 P2d 959 (Okla. 1947) (two related cases) (these cases involved ground and surface damage which was not shown to be caused by abandoned Shell wells, as opposed to other abandoned wells or other sources).

2. Compliance with the abandonment requirements of the governing authority may act to insulate the abandoning party against subsequent claims of liability. Salmon Corporation v. Forest Oil Corporation 536 P 2d 909 (Okla. 1975) (this case involved whether wells previously abandoned met the applicable governmental rules so to bar a subsequent party conducting secondary recovery operations from recouping the cost of "reabandonment" necessary to permit such secondary recovery, as well as questions as to whether normal industry practices were followed by the respective parties).

3. If the party abandoning the well knows of circumstances that may require additional actions to assure a "proper abandonment," a question of fact exists as to whether "proper abandonment" has occurred related to the specific circumstances. Curry v. Ingram, 397 SW2d 484 (Tex. App. 1965) (this case involved pre-existing "shot holes" (created by another party for which the land owner had previously been paid damages) which could not be readily "found" on agricultural land, thus raising a question as to whether the abandonment procedure (including reinjection of salt water at high pressures which may have migrated into "shot holes") was adequate under the circumstances).

Such principles appear to be consistent with the California statutory scheme outlined above (including various protections for "proper abandonments" approved by the Supervisor).

Applying such principles to the abandonment of the Troxel Well:

1. Abandonment of the Troxel Well does not "cause" the pressure to increase. Although abandonment of such well "allows" such pressure to rise to natural hydrostatic pressure levels, there is ordinarily no obligation to continue to produce where there is no economic justification for continuance. If all wells are "properly abandoned," hydrostatic pressure

“..Any possible hydrocarbons or water escaping at surface locations will occur solely through wells that are not ‘properly abandoned’....”

Are SCG operations in Venice & MDR cause for RGC 10’s BLOW OUT?

"If another well (other than the Troxel Well) has not been 'properly abandoned', that is the 'cause' of any production, not SoCalGas' abandonment."

The public needs to know if SCG implemented the strategy in this legal memo. Did SCG allow for the area to gain pressure by allowing an area to 'naturally' reflood? Or as cited as Objective- Is SCG "producing fluid in a manner to contain storage gas in the Main Area." In GC v SCG, we asked as part of the Settlement Agreement for SCG to lower its pressure and contain their gas south of the Ballona Channel. SCG refused.

PLAYA DEL REY WATER REMOVAL STRATEGY FOR
TOWNSITE, TROXEL AND DEL REY AREAS

- 4 -

will not cause hydrocarbons or water to be produced through any well. If another well (other than the Troxel Well) has not been "properly abandoned," that is the "cause" of any production, not SoCalGas' abandonment. (As noted above, I have assumed for purposes of this memo that a fault effectively seals, and will prevent, any migration of hydrocarbons or water from SoCalGas other operations in the Playa del Rey Field.)

- 2. Presumably SoCalGas will work closely with the Supervisor in obtaining his approval of the abandonment of the Troxell Well.
- 3. Even though SoCalGas' expects the pressure to rise and postulates that another well may not be "properly abandoned," this is a mere possibility, which will not occur if all other parties have previously "properly abandoned" their wells. Thus, such "possibility" should have no impact on the matter so long as nothing SoCalGas does in the process of abandonment increases the likelihood that such possibility will occur for reasons other than a natural rise in pressure.

In my view the most important protection for SoCalGas is to work closely with the Supervisor, so that his approval is as broad, knowing and comprehensive as possible. From a legal point of view, SoCalGas should definitely "gold plate" this abandonment and comply "willingly" with what is suggested by the Supervisor -- whatever the cost.

NJP:gl

cc: W. A. Dorland
L. E. LoBaugh

OBJECTIVE

Produce fluid in a manner to contain storage gas in the Main Area. To accomplish this, production targets should be established for the Townsite and Troxel areas that would allow this area to "flood out" and operate at a higher pressure than the Main Area. Water influx should be controlled by utilizing the Del Rey Area and Townsite Area wells in a manner to match influx volumes.

<u>ACTION PLAN</u>	<u>COMPLETION</u>
	<u>DATE</u>
1. Investigate abandoned well histories in the Townsite, Troxel and Del Rey areas. Mark location of abandonments on structure map and note poor abandonments.	4/1/91
2. Investigate pressure histories in the Townsite, Troxel and Del Rey areas. Identify pressure trends and rate of pressure build-up.	5/1/91
3. Estimate size of aquifer(s) feeding Townsite and Troxel areas. Is the aquifer infinite acting or a closed system?	5/1/91
4. Determine maximum allowable operating pressure for Townsite, Troxel and Del Rey area wells.	5/15/91
5. Refine monitoring programs for the Townsite, Troxel and Del Rey areas.	6/15/91
6. Establish production targets.	6/15/91
7. Have consultant review proposed strategy.	8/1/91

RAS:ds
1/15/91

HOW HAZARDOUS IS TOO HAZARDOUS?

Juggling pressure differentials is critical to how and where the oilfield gas moves and is critical for safety.

Formation damage that has occurred gives rise to more gas contamination into aquifers, soils and the surface. Old and poorly sealed wells are the decaying straws that act as conduits for surface migration. RGC 10 was not re-abandoned with a continuous seal from top to bottom. Leakage via a well can occur along any unsealed portion and hop-scotch to the surface.

OPERATING PROCEDURE

The present operating schedule, based upon past experience and tailored to reduce the volume of migration to a minimum, is to start injection at maximum rates late in the fall so that a minimum of 1,100 pounds surface pressure is reached about the first of November. Gas is then withdrawn as needed for the usual morning and evening peak loads with injection during the nights and weekends of sufficient volumes to maintain the pressure above 1,000 pounds. With migration tending to reduce pressures during static periods, it is necessary to inject larger volumes than those withdrawn during this interval to maintain the formation pressure. With the easing of the gas load in spring, injection is stopped and pressures are gradually reduced by withdrawals so that by about April the minimum pressure of 700 pounds is reached. At this point there is no migration and no pressure decline so operations are discontinued until the start of the next cycle.

The pumping oil wells that are shutdown as their gas-oil ratios increase along with the injection in the fall are returned to production as the pressure decreases in the spring. It is anticipated that these wells will also "clean-up" with the continued removal of fluid and eventually become withdrawal wells.

RESERVOIR PERFORMANCE

The pressure-volume behavior of the reservoir has been followed on two bases: first, that of the reservoir as a whole, which includes all the migration area, and, secondly, that of the area inside the limits of the Reconstruction Finance Corporation property from which the high pressure withdrawals are made.

Reigle Report

Should SCG be allowed to continue operations at high pressure levels that cause their gas to migrate beyond their approved boundaries into Venice and Marina del Rey? Continue at such high pressures underneath homes in Playa del Rey?

ABANDONMENT/DEMOLITION STUDY

Playa del Rey Storage Facility

Southern Region Transmission

1993– Channel 2 Action News investigates SOCalGas Operations; Sierra Club calls for congressional investigation of SoCalGas Operations.

SOCALGAS produces Abandonment/Demolition Study for its PDR Facility in apparent response to public scrutiny of their operations.

Introduction

Southern Region, in concert with Environment and Safety, Engineering and Operations Support, Storage Operations, and Gas Control has prepared a report detailing the costs, logistics, and an action plan to decommission and abandon the Playa del Rey Storage Field.

Contents of the study include costs for environmental mitigation/cleanup, well abandonments, and all surface equipment and structures removal. All cost estimates were developed on the basis of providing marketable lots suitable for residential or commercial development.

A strategy for reservoir gas withdrawal, including water flood management, cushion gas recovery, and observation well retention has been included in the report.

The current market value of the properties and lots which will become salable once all work is complete has been estimated and is included within this report.

Transmission Planning has provided information related to operating the Transmission System without Playa del Rey. Consideration was given to peak day demands (risk of curtailment), the effect on the Customer Storage Program, and adding facilities and expansion of withdrawal capabilities at other storage fields.

Operating and Maintenance cost reductions during decommissioning has been estimated.

November 22, 1993

LA City Plan Case No. 15808
(1966)

The Playa del Rey/ Venice oilfields are known to be 'SOUR'-contain high levels of hydrogen sulfide (H₂S).

H₂S is one of the most toxic and corrosive chemicals known. Chronic, low-level exposure can cause permanent brain & neurological damage.

CITY PLAN CASE NO. 15808

DECISION DATE: 6-23-66

The Los Angeles County Air Pollution Control District

The District favors the repeal of these ordinances or a much more strict enforcement of good operating procedures in order to adequately abate a source of odor complaints. From time to time in the past, complaints have been received concerning the total oil-production operations within this area.

Investigations of the area have revealed that the oil field is a marginal productive one and that it is the only oil field in the Los Angeles Basin producing quite sour petroleum crude. The term "sour" means that there are sulfur compounds in the crude oil. When these are exposed to the atmosphere the odorous material evaporates and is quite noticeable at extremely low concentrations. Another problem of this field is its age. Being quite old, the equipment is subject to frequent breakdowns. When the sucker rods break, they have to be fished out and this allows the crude oil to be exposed to the air more than normal. The sum result is poor housekeeping and more pollution (odors) than necessary.

The Department of Fire states that although a conversion to subterranean operation would create fire hazards not encountered in aboveground operations, they consider that properly engineered safeguards could reduce fire hazards sufficiently to allow safe operation.

They also mention that under the present ordinance, the Fire Commission may grant variances not exceeding 10% of the required clearances. Any substantial reduction in clearances by an amending ordinance should necessarily impose additional safeguards from fire and exposure to fire.

This Department states that if this present R-1 property is to be developed in the future, tract maps should be submitted. North of Esplanade East is lacking in adequate fire protection even for R-1. Fire hydrants will be required.

The City Administrative Officer (Petroleum Administrator) states that subterranean facilities would be impractical for the Peninsula area, necessitating a large cellar. In view of the high level of the water table that would be encountered (with attendant dangers of flooding or floating phenomena), costs would be high, perhaps prohibitive, for most wells. An appraisal indicates that 2,500,000 barrels of oil will be recovered by the oil producers in the Venice Oil Field Study area within the next 24½ years. Recovery of this volume together with associated natural gas would represent a present day value of approximately



1955 Workmen Mill Road, Whittier, CA 90601-4998
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (310) 699-7411, FAX: (310) 693-6139

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

CHARLES W. CARR
Chief Engineer and General Manager

March 18, 1993
File: 05-00.05-0093-5168
Account 1767953

Ms. Laurie S. Fronczek
Staff Engineer - Water Systems
The Gas Company
P. O. Box 3249
Los Angeles, CA 90051-1249

Dear Ms. Fronczek:

Approval of Use of UCARCIDE 142 or 114 as a Biocidal Agent

The Districts have reviewed The Gas Company's request to use Ucarcide 142 (U-142) or Ucarcide 114 (U-114) as a biocidal agent for the treatment of microbiologically influenced corrosion in The Gas Company's Playa Del Rey wastewater collection and treatment system. The Districts hereby grant approval for The Gas Company to use these biocides subject to the following restrictions:

1. Biocide application concentrations at the effluent monitoring site shall not exceed 200 mg/l for U-142 or 600 mg/l for U-114.
2. Total facility daily discharge of these biocides shall not exceed 35 gallons for U-142 or 105 gallons for U-114.
3. Biocide application storage containers shall not exceed 250 gallons in capacity and shall have provisions for spill containment. Storage containers shall also have provisions to prevent accidental drainage of entire contents into the addition point.
4. The Gas Company shall maintain records of biocide usage and shall upon request of Districts' personnel provide copies of usage records.

The Gas Company is responsible for assuring that excessive amounts of U-142 or U-114 are not discharged to the Districts' sewerage system. If any adverse impacts to the Districts' wastewater system are attributed to biocide addition by The Gas Company, the biocide addition shall be terminated.

If you have any questions, please contact Brent C. Perry of the Sanitation Districts' Industrial Waste Section at extension 2930.

Very truly yours,

Charles W. Carr

Paul C. Marryn
Paul C. Marryn
Head, Industrial Waste Section

PCM:BCP:jav

H₂S
SOUR
field

Biocides are used by SCG in the attempt to offset corrosion.