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SUPERIOR COURT, METROPOLITAN DIVISION
COUNTY OF KERN

JAN 19 2012

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16 [*LAMONT PUBLIC UTILITY DISTRICT IS A SPECIAL DISTRICT AND A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA,
EXEMPT FROM PAYMENT OF COURT FILING FEES PURSUANT TO GOVERNMENT CODE SECTION 6103]

18 SUPERIOR COURT OF CALIFORNIA, COUNTY OF KERN
19 METROPOLITAN DIVISION

20 * * *

21	COMMUNITY RECYCLING & RESOURCE)	CASE NO. S-1500-CV-275272-EB
	RECOVERY, INC., a California corporation and)	Complaint filed: 11/22/11
22	LAMONT PUBLIC UTILITY DISTRICT, a public)	
	entity,)	
23)	DECLARATION OF FRED GILLET IN
	Petitioners/Plaintiffs,)	SUPPORT OF PETITIONERS' REPLY TO
24)	RESPONDENT'S OPPOSITION TO EX PARTE
	vs.)	APPLICATION FOR STAY OF ADMINISTRATIVE
25)	ORDER REVOKING CONDITIONAL USE
	COUNTY OF KERN, a public entity, and DOES 1)	PERMIT
26	through 100, inclusively,)	[CCP §1094.5(g)]
)	
27	Respondents/Defendants.)	

COPY

1 I, FRED GILLETT, declare as follows:

2 1. I make this declaration in support of Petitioners' Application for Stay of
3 Administrative Order Revoking Conditional Use Permit. I have personal knowledge of the
4 facts set forth herein except as to matters stated upon information and belief as to which I
5 believe them to be true and if called to testify, I could and would competently testify thereto.

6 **Qualifications:**

7 2. I am a professional consultant in occupational safety and health and general
8 liability safety issues. (A copy of my curriculum vitae is attached and incorporated as Exhibit
9 "A.") I have owned and operated my own company, Xordium, since 1985. I represent
10 employers on Cal-OSHA issues. I have provided expert evaluation on Cal-OSHA, workers'
11 compensation and personal injury matters.

12 3. I have provided safety and health management and consultation services to a
13 wide variety of companies in California since 1969. Prior to 1969 I was trained and served as a
14 Safety Technician in the United States Air Force with specialty in industrial safety "Ground
15 Safety" and vehicle operations "Traffic Safety." I was trained and participated in incident
16 investigations in the USAF since 1961 and have actively participated in incident investigations
17 since that time.

18 4. I have instructed at several colleges and universities in southern California in the
19 safety profession disciplines as well as providing specific training in the OSHA and Cal-OSHA
20 standards since 1976. I hold lifetime California teaching credentials.

21 5. I have testified as an expert witness on safety issues in court and jury trials in the
22 State of California, as well as before arbitrators. I also have represented client companies on
23 matters before hearing officers and Administrative Law Judges in appeals before the
24 Occupational Safety Appeals Board.

25 6. On December 22 2011, Kern County filed its Opposition to Community
26 Recycling's request for a stay (i.e., CASE NO. S-1500-CV-275272 EB, RESPONDENT
27 COUNTY OF KERN'S OPPOSITION TO PETITIONERS' EX PARTE APPLICATION FOR
28 STAY OF ADMINISTRATIVE ORDER REVOKING A CONDITIONAL USE PERMIT

1 7. The Opposition contains numerous assumptions and assertions which are not
2 correct. These assumptions and assertions are addressed below.

3 **Assertion That H₂S Caused The Deaths Of Two Community Recycling Employees**

4 8. The county claims that: *on October 12, 2011, an accident occurred at the CRRR*
5 *facility in which two employees of CRRR died due to exposure to hydrogen sulfide gas during*
6 *maintenance of below ground on-site drainage materials. (See Declaration of Lorelei Oviatt,*
7 *pp. 6:28 -7:7)*

8 9. The assumptions and claims made by the County are inaccurate. Cal/OSHA has
9 jurisdiction over the employee deaths and is investigating the facts and circumstances
10 surrounding the deaths. The County of Kern does not have jurisdiction over this investigation
11 and is not involved in the investigation.

12 10. The county claims that H₂S gas caused the deaths. This statement is not
13 supported by evidence. According to the Incident Report, the Kern County responding
14 emergency unit from the fire department arrived on the scene at 11:43 A.M. on October 12 and
15 was not able to take readings of any gas upon their arrival and requested assistance from the
16 Kern County Department of Environmental Health for testing. (See Incident Report 2011-
17 1131690-000 attached hereto and incorporated as Exhibit "B.")

18 11. I am informed and believe that requests for substantiation and monitoring data
19 results were made to the Kern County Department of Environmental Health, however, no data
20 has been produced. To my knowledge, no autopsy report has been produced to determine the
21 cause(s) of death.

22 12. In my expert capacity as a Cal/OSHA consultant, I interfaced with Cal/OSHA
23 officials to investigate the cause of the deaths and to evaluate any ongoing threats. As a part of
24 my expert review, I met with the Lead Investigator from Cal/OSHA and the Senior Industrial
25 Hygenist and discussed the status and finding of the Cal/OSHA investigation. Information I
26 obtained indicated that tests performed by Cal-OSHA at the incident scene on October 14
27 showed no indication that H₂S existed in excess of threshold limit values based upon time
28 weighted averaging which would have caused the deaths of the workers. (See Title 8

1 Subchapter 7. General Industry Safety Orders Group 16. Control of Hazardous Substances
2 Article 107. Dusts, Fumes, Mists, Vapors and Gases section 5155 Appendix and Table AC-
3 lattached as Exhibit "C" regarding threshold limits.) Information obtained from the Senior
4 Industrial Hygienist for the Division, who took tests in the manhole where the two men died
5 indicated to me that the first test he took showed no indication of H₂S in the storm drain
6 manhole and it was not until he stirred up the mud at the bottom of the vault that he obtained a
7 reading of only 10.4ppm. It is permissible by Cal-OSHA standards to work in an environment
8 containing 10ppm of H₂S for an 8 hour work day. (see Exhibit "C.")

9 13. Based upon my interaction and conversations with Cal-OSHA, it is my
10 understanding that the Cal/OSHA on-site investigation is completed. To date Cal-OSHA has
11 not issued any citations nor made any conclusions as to the cause of death. There is no
12 verifiable evidence or any scientific conclusion that Hydrogen Sulfide (H₂S) caused the deaths
13 or created an imminent health or safety concern.

14 14. Additionally, observations of first responders did not suggest the presence of
15 H₂S gas. H₂S is a strongly pungent gas which in low concentrations is characterized by a rotten
16 egg odor, which was not reported. (See H₂S Fact Sheet Exhibit "D.") If H₂S gas was present,
17 the first responder's of Kern County Fire Company 54 likely would have recognized an H₂S
18 odor when they stood over the open storm drain manhole observing and calling out to the two
19 victims (see page 6 of Incident Report 2011-1131690-00).

20 15. Based upon my expert evaluation it cannot be concluded, based upon current
21 evidence, that H₂S caused the deaths. Additionally, there is no evidence that H₂S is present in
22 concentrations that is any current threat to anyone working at Community Recycling.

23 **The County Suggestion That CR&RR Purposefully Violated Cal-OSHA's OPU Is Not**
24 **Accurate Since I Advised Community That It Could Properly Use An Independent**
25 **Contractor To Clean The Storm Drain**

26 16. The county staff (Lorelei Oviatt) makes claim 29 that: *[o]n November 14, 2011,*
27 *Ms. Ellen Widess, the Director of Cal/OSHA, provided a statement which indicated that*
28 *Cal/OSHA had learned that CRRR had violated multiple Orders Prohibiting Use ("OPU") that*

1 were issued by Cal/OSHA on October 14, 2011, and on November 2, 2011." Ms. Oviatt further
2 quoted Ms. Widess' comment that "The OPU's specifically prohibited entry and use **where**
3 **confined spaces are present in the storm drain system at the CRRR compost facility, including**
4 **a 6-foot area around each opening.**"(Emphasis added)

5 17. The original OPU prohibited "Storm Drain Cleaning with **employees** using
6 water hoses", (OPU sent to Community on October 14, 2011). I advised Community that
7 although employees were prohibited from cleaning the storm drain manholes, an independent
8 professional contractor could properly finish the clean out process. Subsequently, and before
9 work commenced, I reviewed the plan to use a professional outside contractor with the Cal-
10 OSHA Area Manager, Mr. Jerry Walker. I am informed and believe that Mr. Walker
11 conferred with his Industrial Hygienist Eric Berg.

12 18. On 11-2-2011, I received an amended OPU which was e-mailed at 5:30
13 P.M. replacing the first OPU. The amended OPU referenced "the complete and entire storm
14 drain system where **confined spaces** are present and all **entries** and **openings** into the storm
15 drain system including a 6' area around each opening" (emphasis added) and stated "Therefore
16 **entry into or use of said place of employment**, or portion designated as dangerous, or use of
17 said equipment described above is prohibited." (emphasis added)

18 19. I again contacted Cal-OSHA regarding the wording of the amended OPU
19 because it was confusing as to the word "use" as the system would continue to be "used" as it
20 drained water. I was told by Cal-OSHA that the operative word was "entry" and that no one
21 was to enter into the system.

22 20. Based upon the Cal-OSHA clarification that "use" could continue but
23 "entry" was prohibited, based upon by professional experience, I advised Community
24 Recycling management that as long as there was no "entry" into the system, a contracted
25 professional third party could clean the drains without being in violation of the OPU, provided
26 that no Community employee was involved in the activity.

27 21. Advanced Sewer Technologies (AST), with a C-42 Contractor License
28 (State license #803638), whose specialty is cleaning storm drains and sewer systems was

1 contracted to clean the storm drain system. Because of the OPU and concern of potential toxic
2 gases, a requirement was imposed on AST that there would be no entry into the storm drain,
3 that all work would be accomplished with a vacuuming system and that any worker(s)
4 approaching the open manhole would be restrained from being able break the horizontal plane
5 of the opening to any manhole.

6 22. It is my understanding that Cal-OSHA Director, Ms. Widess, in her note to
7 the Kern County Board of Supervisors, stated that she believes that the OPU was violated
8 because Community Recycling did not comply with the OPU stating that "*Roto-Rooter did*
9 *enter into the drain system through various openings on November 5, 7, 9, 10 and 11. These*
10 *entries are in violation of the OPU.*"

11 23. Cal-OSHA Title 8 section 5157 (b) Definitions: *Entry means the action by*
12 *which a person passes through an opening into a permit-required confined space. Entry*
13 *includes ensuing work activities in that space and is considered to have occurred as soon as*
14 *any part of the entrant's body breaks the plane of an opening into the space.*

15 24. In compliance with the amended OPU, Community employees were
16 prevented from entering as a "place of employment" an area within 6 feet of the storm drain
17 opening and from the confined space within the storm drain.

18 25. AST was advised of the hazards identified by Cal-OSHA and specific
19 instructions were given to AST not to enter the confined space of the storm drain.
20 Additionally, AST was advised to use personal restraint devices to assure that no entry into the
21 storm drain was possible even by inadvertent actions.

22 26. I personally observed the activities of AST on several occasions. Based
23 upon my observations and upon information and belief, AST did not "enter" the storm drain
24 system during the cleaning operations on November 5, 7, 9, 10 and 11 as claimed by Ms. Oviatt
25 based upon the letter from Ms. Widess. Additionally, AST was complying with all
26 recommended safeguards.

27 27. Perhaps Ms. Widess was uninformed when she wrote the letter, or
28 improperly interprets the 6' around the storm drain as a "confined space". The 6' area around

1 the storm drain opening was not a confined space as defined by Cal/OSHA and all Community
2 employees were kept out of this area. Nevertheless she was not present when AST cleaned the
3 drains and has no personal knowledge of what occurred.

4 28. Although AST was within an area within 6 feet of the confined space when
5 it cleaned the drains they used personal restraint devices at all times. Furthermore, AST was
6 not in my professional opinion an "employee" as defined by the Cal/OSHA Directors
7 information website, http://www.dir.ca.gov/dlse/FAQ_IndependentContractor.htm entitled
8 **Independent contractor versus employee** as it related to the OPU. Consistent with
9 Cal/OSHA guidelines, my reading of the OPU's was that only employees of Community
10 Recycling were prohibited from being within 6 feet of the confined space of the storm drain
11 and that the independent contractor hired to clean the storm drain system could work within
12 the 6' area. I provided this professional opinion to Community Recycling before AST began
13 the cleaning operation.

14 29. AST performed all of its work cleaning out the storm drain within this 6'
15 area properly restrained to avoid any inadvertent entry into the confined space. AST did not
16 "enter" the confined space of the storm drain as defined by Cal-OSHA Title 8 section 5157.

17 30. It is my professional opinion that Community Recycling properly restricted
18 its employees from being within 6 feet of the confined space of the storm drain or from
19 "entering" into the storm drain system as required by the OPUs. In addition, although AST was
20 not an employee within the meaning of the OPU, AST nevertheless did not "enter" the storm
21 drain system and was required by Community Recycling to provide the "required safeguards or
22 safety appliances" to make the operation safer.

23 31. As of the date of this declaration, no citation or notice has been received
24 from Cal-OSHA by me or, based upon information and belief, by Community Recycling,
25 indicating that my professional opinion was incorrect or that the actions of Community were in
26 violation of LC 6326.

27 32. After submission of a Safety Plan for Storm Drain Maintenance and
28 acceptance by Cal-OSHA, on January 10, 2012 the OPU was lifted. A true and correct copy of

the counter signed letter lifting the OPU and the approved Safety Plan for Storm Drain Maintenance is attached as Exhibit E.

The Widess Letter Was Not Timely Provided To Community Recycling or Me For Comment Before The November 15, 2011 Hearing

33. It is my understanding that the November 14, 2011 letter authored by Ms. Widess, was sent to the County and Supervisor Goh, the day before the hearing. No effort was made by Kern County staff or Supervisor Goh to reveal or discuss the matter with me before the hearing. If the letter had been disclosed to Community Recycling and me, I could have discussed the "entry" and independent contractor issues with Ms. Widess and or with Supervisor Goh before the hearing.

34. To the best of my knowledge, the Widess letter was not circulated nor shared with Community Recycling and was not provided to me, notwithstanding a meeting which I attended with Supervisor Goh on November 14, 2011, the day before the hearing. I did not see this letter until I received a copy at the Board of Supervisor's hearing on November 15, 2011.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 18th day of January, 2012, County of Orange, California.


FRED C. GILLETT

EXHIBIT “A”

loss. I establish open communications with the injured party and everyone associated with the recovery process.

I have worked with a variety of employers including the construction industry, manufacturers, service and hospitality. I have assisted clients, through reduction of incidents and injury management, reduce their operational and workers' compensation costs. These reductions in costs have well exceeded my fees. Consulting to corporate clients represents 90% of my business.

As an expert I review evidence through investigation of the circumstances of the incident and photographs of the incident site, safety documentation, depositions of claimant and witnesses, engineering studies, medical reports, and to assist the legal team in making a decision as to issues of liability. I must examine the evidence, do my research, compile and reconcile voluminous amounts of data to determine cause factors and in making my conclusions of liability. I have provided testimony in numerous depositions, before arbitrators, judges and juries. Providing expert witness consulting represents 10% of my business.

As a corporation from 1985 to 2002, I managed as many as 10 employees providing risk control services to over 60 clients. In 2002 I down-sized and today I personally provide services to a manageable group of retainer clients, fee for service jobs and expert witness assignments.

**Waite Hill Services, Inc. subsidiary of Figgie
International
Orange, California US**

6/1981 - 8/1985

Manager, Insurance Services

I consulted with insured accounts on liability issues. I managed and supervised staff of field underwriters, loss control and liability and workers comp claims adjusters. I oversaw risk management of 22 Figgie International company locations and \$10,000,000 of insurance premium accounts in western United States. Developed underwriting packages, including risk profiles for property, public and product liability, and workers' compensation packages. Workers' compensation included multiple states and countries, LHWCA and Jones Act exposures.

I supervised a staff of 5 personnel. As a consulting group I required knowledge and access to all applicable State and Federal laws, regulations, court proceedings, precedents, legal practices. I assessed and understood the needs of my clients so as to satisfy their expectations. I made my recommendations and decisions on legal precedent, well-informed objective findings and predicted the impact and implications of decisions on the company's overall organizational goals and mission statement. I motivated to a commitment for action and, where needed, caused change. I was committed to a high level of initiative in completing assignments in a timely manner and requested my staff to be of like initiative. We worked well as a team but I was not hesitant in making recommendations in a team setting as the team leader, but readily accepted recommendations from others and, when

appropriate, negotiated to identify mutually acceptable solutions. During this period of employment I instructed at Orange Coast and Fullerton Colleges on Occupational Safety and Workers' Compensation courses in the adult education programs. Clients included construction, manufacturing, commercial launderers, hospitality, restaurant and insurance brokers and reinsurance carriers. I conducted seminars and spoke before trade and professional organizations on insurance, safety, liability and risk/cost control methodology.

**Interstate Electronics Corporation
Anaheim, CA US**

7/1979 - 6/1981

Manager Safety, Workers' Comp, Medical Departments

I provided risk control activities, including safety, workers' compensation (State, LHWCA and Jones Act), RCRA and medical services in support of Corporate aerospace, U.S. Navy, DOD, and EPA marine contracts. EPA Contract required scientific staff aboard an EPA vessel doing oceanic and harbor bottom waste samplings. Navy contracts involved nuclear submarine work at harbor and at-sea trials. I consulted with contract counterparts on maritime and international loss issues. I personally investigated incidents relating to injury, gather pertinent information, discerned fact, analyzed liability issues, reviewed medical evidence, identified employment relationship, developed physical and mental demand profiles of tasks performed by employees, was able to understand and interpret applicable laws and regulations of safety issues and workers' compensation, prepared issues for legal counsel and, when necessary and appropriate, adjudicated claims before Review Boards or Safety Hearing/Appeals Boards. I worked closely with outside medical personnel and rehab professionals to assure timely return-to-work and maintained relational communications with all pertinent parties associated with the reported loss. I established open communications with the injured party or his/her survivor. Although most cases were routine there were issues more complex such as LHWCA, Jones Act and asbestos exposure. Others included blood and/or lung disorders, exposure to radiation (both ionizing and non-ionizing), and chemical exposures which require extensive evaluation both toxicological and medical close review and the exposing environment. I have worked with industrial hygienists, toxicologists and medical staff to isolate and determine potential causal factors and a relationship to the claimant's exposures. Extensive fact finding and definition of questions and issues that needed to be communicated to all concerned individuals was important to final determinations. Any conflicts that arose was addressed immediately with all parties to resolve issues as they corresponded to legal precedence and/or governing regulations. I saved this employer hundreds of thousands of dollars in making critical decisions based on good investigative and fact-finding work.

**Rockwell International,
Collins Radio Division,
Micro Electronics Devices Division,
Newport Beach, California US**

6/1976 - 7/1979

Supervisor, Safety, Medical and Workers' Compensation

I provided risk control activities for support of corporate missions for this aerospace and commercial products organization. The company consisted of three operating divisions of Rockwell International and our department served over 2,500 employees. I was the Certified Self-Insured Administrator under California Self-Insured Plans and coordinator of LHWCA claims and was the supervisor of the occupational health, safety and medical departments. I established an occupational safety and industrial hygiene monitoring program for production and research labs handling extremely hazardous and deleterious materials. I established training protocols and trained personnel on safety, industrial hygiene and hazardous materials handling and storage. Trained personnel personal hygiene and use of personal protective equipment as well a response to emergency conditions. I trained emergency response teams. I investigated all loss incidents and claims of injury to determined cause factors and corrective measures. I performed AOE/COE investigations, gathered relevant data, identified and analyzed evidence and determined liability. I developed and wrote physical demand profiles for return-to-work criteria to be used by consulting physicians in making return-to-work decisions. Conferred with consulting physicians and legal consul and adjudicated claims before Appeals Board. Reduced workers' compensation legal claims by 97% by implementing an employee workers' compensation awareness program. Earned lifetime teaching credentials through UCLA program and taught California Occupational Health and Safety and Workers' Compensation Law at Orange Coast College, Costa Mesa, California and Fullerton College, Fullerton, California. I guest lectured at Cal-Poly Pomona, UCLA, USC and UCI programs on approaches to safety and workers' compensation cost effectiveness. I worked closely with the Orange County Red Cross on CPR and First Aid and conducted train-the-trainer classes in CPR and First Aid.

Leatherby Insurance Company
Fullerton, CA US

6/1975 - 6/1976

High Risk Loss Control Consultant

I provided consultative workers' compensation insurance risk control services to high risk, high premium insurance accounts. I provided risk control, injury investigation, training and loss analysis consult with clients, underwriting and workers' comp claims departments. I investigated all serious injury incidents occurring at my client locations. My assignments required complex fact finding and careful interpretation of all applicable California occupational health and safety regulations and consideration of workers' compensation laws. I developed policies and procedures for implementing and evaluating safety programs which was used throughout the Loss Control Department of Leatherby Insurance Company. I coordinated and supported client safety activities and the client companies' internal operations to ensure safety requirements are integrated into their organizations. I maintained close liaison with state and municipal governing organizations, as well as, Leatherby's workers' comp claims unit and underwriters. I Arranged for group

meetings or individual instruction through coordination with corporate management of client companies.

I conducted and assisted in managing site safety programs. I evaluated safety program effectiveness through statistical analysis and supervisory performance evaluations. I coordinated with governing agencies and client staff activities to ensure compliance with safety related matters. I prepared and conducted briefings, meetings, training classes, and associated functions. I established physical demand profiles for return-to-work programs to be used by consulting physicians. I determined safety education requirements for groups or individuals. I developed training plans to assure worker qualification and training. I prepared and conducted training programs for supervisors, managers and safety personnel. I worked with the National Red cross as an instructor of instructors in first aid and CPR. I conducted CPR certification for medical professionals.

**Industrial Health and Safety Associates
Santa Ana, California US**

4/1974 - 6/1975

Owner/Consultant

As owner and sole consultant I provided consultative services on Cal-OSHA and workers' compensation issues to client companies. I consulted with safety equipment companies in design of customized personal protective equipment for use in adverse exposures. I developed and marketed fire safety training materials for use by elementary school teachers in their curriculum.

I provided occupational safety, injury investigation, training and loss analysis consult with clients. I investigated injury incidents and consulted with workers' compensation insurance claims examiners on issues of AOE/COE and return-to-work of injured employees. Injury consulting required complex fact finding and careful interpretation of all applicable California occupational health and safety regulations and workers' compensation rules. I developed policies and procedures for implementing and evaluating safety programs. I coordinated and supported client safety activities and client companies' internal operations to ensure safety requirements are integrated into their organization and met California safety codes. I maintained close liaison with state, municipal, workers' comp insurance claims unit. Arranges for group meetings or individual instruction through coordination with client companies management.

I conducted and/or assisted in managing companies safety programs. I evaluated safety program effectiveness by establishing measurement protocols with client management. I coordinated staff activities on safety related matters and prepared/conducted briefings, meetings, training classes, and associated communications within the corporate management system. I determined safety training requirements based on State and Federal regulations for groups or individuals. I developed training plans to ensure worker qualification and training. I prepared and conducted training programs for supervisors, managers and safety

personnel. I worked closely with the Cities of Santa Ana and Tustin Fire Departments in industrial and public fire safety issues. I assisted, as Chairman of the Public and Industrial Fire Prevention Committee, in the Santa Ana Fire Department winning the National Fire Prevention awards for two consecutive years, 1974 and 1975, for Outstanding Industrial and Public Safety Programs.

**Thompson Safety
Los Angeles, CA US**

6/1972 - 4/1974

Safety Consultant

I consulted with clients of Thompson Safety to determine appropriate application of safety equipment to exposures and assisted other staff in proper selection, use and maintenance of personal protective and environmental monitoring equipment sold by Thompson Safety. I assisted equipment manufacturers with design and application to meet OSHA standards.

I provided risk control, injury investigation and training consult with Thompson Safety clients. I investigated injury incidents to determine cause factors and corrective measures in support of client safety management and in potential product liability issues. Injury and product liability consulting required complex fact finding and careful interpretation of all applicable California occupational health and safety regulations as well as legal precedent. I assisted clients in establishing physical demand profiles and for personnel using personal protective equipment to be used consulting physicians to use as criteria for job application. I developed policies and procedures for implementing and evaluating safety programs effectiveness. I coordinated and supported client safety activities and companies' internal operations to ensure safety requirements are integrated into their organization. I maintained close liaison with state, municipal, workers' comp insurance claims and loss control units. I arranged for group meetings or individual instruction through coordination with corporate management.

I prepared and conducted briefings, meetings, training classes, and associated communications functions with client companies as to the use of equipment used in support of safety program. I determined safety training requirements based on State and Federal regulations for groups or individuals. I developed training plans to ensure worker qualification and training. I prepared and conducted training programs for supervisors, managers and safety personnel.

I worked with the National Red Cross in CPR and First aid training as an instructor.

**National Cash Register Company, Data Processing 8/1969 - 7/1972
Division
Rancho Bernardo, CA US**

Division Safety Manager

Oversaw the construction of a 1 million sq. ft. manufacturing facility for compliance with occupational safety and health considerations. Supervised occupational health

and safety and workers' compensation issues for two Southern California locations of NCR Data Processing Division. I provided risk control activities for support of corporate missions for this computer manufacturing company. The company consisted of two divisions of National Cash Register Company and our department served over 750 employees in San Diego and 1,200 personnel in Hawthorne, California. I was the supervisor of the occupational health, safety and medical departments. I established an occupational safety and industrial hygiene monitoring program for production, research labs handling extremely hazardous and deleterious materials and warehousing operations. I established training protocols and trained personnel on safety, industrial hygiene and hazardous materials handling and storage. I trained personnel on personal hygiene and use of personal protective equipment as well a response to emergency conditions. I trained emergency response teams. I investigated all loss incidents and claims of injury to determined cause factors and corrective measures. I performed AOE/COE investigations, gathered relevant data, identified and analyzed evidence and determined liability. I developed and wrote physical demand profiles for return-to-work criteria to be used by consulting physicians in making return-to-work decisions. Conferred with consulting physicians and workers' compensation insurance carrier on claims management. I worked closely with the San Diego Safety Council and American Red Cross. I was a certified on CPR and First Aid instructor through Red Cross training conducted by San Diego Community College. Completed 40 hour Hazardous Materials Fire Safety course through San Diego Safety Council.

United States Air Force

8/1968 - 6/1969

Last assignment:

Cam Rahn Bay, South Viet Nam

Honorable Discharge (8 years service)

Safety Technician

USAF 1961-69 Served in Vietnam (1969) as the construction safety engineer for the Ground Electronics Engineering Installation Agency (485th GEEIA). Responsible for the safety oversight for mission objective fulfillment in operations requiring the installation of communications equipment throughout South Vietnam under adverse wartime conditions. Was responsible for oversight of Squadron Safety activities reporting directly to Squadron Commander. Investigated all injury incidents and all property damage reports of \$1500 or greater. Assignment required complex fact finding and careful interpretation of all applicable USAF regulations and construction safety rules. Norton Air Force Base 1965 -68, 63rd Military Airlift Wing Ground Safety Office, Ground Safety Technician and Flight Line safety support operations. Planned, organized, and directed safety activities. Developed policies and procedures for implementing and evaluating safety programs. Coordinates with staff activities and operational sections to ensure safety requirements are integrated into the organization. Maintains close liaison with federal, state, municipal, and private agencies. Arranges for group meetings or individual instruction through coordination with commanders and supervisors.

I conducted and assisted in managing safety programs. I evaluated safety program effectiveness by statistical review of loss data. I coordinated with agencies and staff activities on safety related matters. I prepared and conducted briefings, meetings, training classes, and associated functions. I determined safety education requirements for groups or individuals. I developed training plans to ensure worker qualification and training. I prepared and conducted training programs for collateral duty safety personnel.

I performed inspections, surveys, and program evaluations of areas and operations to identify mishap potentials and assess integration of risk control procedures. I performed periodic and special inspections of facilities, flight lines, maintenance, and industrial areas; and non-industrial and recreational areas. I reported findings, assigned risk assessment codes, recommended corrective actions, and conducted follow-up inspections. I participated in Hazardous Communication, Environmental Compliance Assessment Management Program, and other environmental programs. I reviewed purchase, service, and construction contracts to assure compliance with safety standards. I reviewed engineering plans and drawings for conformance to safety standards. I reviewed base master plans and site plans affecting construction, airfield, and operational safety criteria. I recommended revision in drawing or materials.

I performed mishap investigations, prepared reports, and maintained records. I gather factual mishap data, identified causes, and recommended corrective actions to prevent recurrence of a similar mishap. I maintained a follow-up system.

From 1964 to 1965 I served as base traffic safety NCO Shemya AFS, Aleutian Islands. 1961 to 1964 I served at McChord AFB in Tacoma Washington as a motor vehicle operator and traffic safety instructor. DD214 available upon request.

EDUCATION and OTHER EXPERIENCE

University Of California Los Angeles,
Teaching Certification

Major: Teaching

Minor: Behavioral Psychology

USAF Safety training programs as Safety Specialist (1S0X1 - SAFETY) College equivalent Bachelors Degree and multi-media training.

I attended San Bernardino Valley College in 1966-67 with emphasis on Engineering; Palomar College and Mira Mesa College 1969-71 with emphasis on Psychology and

Chemistry. University of Irvine in Management and Marketing.

I have attended a multiplicity of classes and seminars relating to occupational safety, fire prevention, fire suppression, industrial hygiene, workers' compensation, LHWCA, self-insured administration of workers' comp, liability insurance agents licensing, medical management, legal liability and incident investigation. Continuing education for trends and decisions.

Authored 2 books for USAF distribution on flight line safety and traffic safety, "Circle of Safety" and "Circle of Danger."

I have written several articles published in Chamber of Commerce newsletters, association magazines and professional publications. I also published a monthly newsletter on safety management issues for five years with distribution to over 100 subscribing companies.

I have lectured on issues of safety and risk management to corporate groups, association conferences and at several California Colleges and Universities.

Instructor in OSH and CA Workers Compensation Insurance programs at Orange Coast College and Fullerton College. 1979-1986.

Exhibit B Fire Department Incident Report (available from Mark Smith)

EXHIBIT “B”

Incident Report

Kern County

2011-1131690 -000

Basic	
Alarm Date and Time	11:29:02 Wednesday, October 12, 2011
Arrival Time	11:43:07
Controlled Date and Time	
Last Unit Cleared Date and Time	14:10:03 Wednesday, October 12, 2011
Response Time	0:14:05
Priority Response	Yes
Completed	Yes
Reviewed	Yes
Release to Public	Yes
Fire Department Station	K51
Shift	B
Incident Type	355 - Confined space rescue
Initial Dispatch Code	RX
Aid Given or Received	N - None
Alarms	1
Action Taken 1	22 - Rescue, remove from harm
Action Taken 2	32 - Provide basic life support (BLS) KCFD
Action Taken 3	55 - Establish safe area
Casualties	No
EMS Provided	Yes
Apparatus - Suppression	7
Personnel - Suppression Personnel	19
Property Use	919 - Dump, sanitary landfill
Location Type	Address
Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241
Latitude	17.2706096
Longitude	-619.35831

COPY
 Information contained in this report/record is
 not to be furnished to any person/agency except
 as authorized by law.

COPY FOR THE EXCLUSIVE USE OF
Clifford & Brown
 KERN COUNTY FIRE DEPARTMENT
 REPORT RECORDS
 By DW Date 11/8/11

Person Involved - Addis, Chuck	
Involvement Code	REP
Last Name	Addis
First Name	Chuck
Business Name	A & B Harvesting
Street Address	
Phone	8058386585

Person Involved - Avalos, Enedino	
Involvement Code	MGR
Last Name	Avalos
First Name	Enedino
Business Name	Community Recycling
Street Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241
Phone	6613437425

Person Involved - Baldwin, Robert	
Involvement Code	PM

Incident Report

Kern County

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Person Involved - Baldwin, Robert	
Last Name	Baldwin
First Name	Robert
Business Name	Community Recycling
Street Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241
Phone	6613036207

Person Involved - Bartlett, Jimmy	
Involvement Code	MAINT
Last Name	Bartlett
First Name	Jimmy
Business Name	Community Recycling
Street Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241
Phone	6613301309

Person Involved - Flores, Eduardo	
EMS Patient	Yes
Involvement Code	EMP
Last Name	Flores
First Name	Eduardo
Business Name	Community Recycling
Street Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241

Person Involved - Martinez, Jose G	
EMS Patient	Yes
Involvement Code	EMP
Last Name	Martinez
First Name	Jose
Middle Initial	G
Business Name	Community Recycling
Street Address	1261 N WHEELER RIDGE RD
City, State Zip	KERN COUNTY, CA 93241

Person Involved - Ramirez, Eladio	
EMS Patient	Yes
Involvement Code	EMP
Last Name	Ramirez
First Name	Eladio
Business Name	A & B Harvesting
Street Address	1552 Royal ST
City, State Zip	Arvin, CA 93203

Person Involved - Starkey, Dan	
Involvement Code	FLD
Last Name	Starkey
First Name	Dan

Incident Report
2011-1131690 -000

Kern County

Person Involved - Starkey, Dan	
Business Name	KC Environmental Health
Street Address	

Apparatus - HM66	
Apparatus ID	HM66
Apparatus Dispatch Date and Time	11:41:21 Wednesday, October 12, 2011
En route to scene date and time	11:42:22 Wednesday, October 12, 2011
Apparatus Clear Date and Time	12:06:34 Wednesday, October 12, 2011
Apparatus priority response	Yes
Apparatus cancelled after dispatch	Yes
Number of People	5
Apparatus Use	1
Apparatus Action Taken 1	93 - Cancelled en route
Apparatus Type	93 - Haz Mat unit
Personnel 1	K0746 - Duncan, Aaron S Position: FC
Personnel 2	K0606 - Romero, Anthony R Position: FE
Personnel 3	K0888 - Pudiwitr, Dustin E Position: FE
Personnel 4	K1052 - Sandoval, Nicholas R Position: FF
Personnel 5	K1099 - Lichenstein, Matthew E Position: FF

Apparatus - E52	
Apparatus ID	E52
Response Time	0:14:05
Apparatus Dispatch Date and Time	11:29:02 Wednesday, October 12, 2011
En route to scene date and time	11:29:02 Wednesday, October 12, 2011
Apparatus Arrival Date and Time	11:43:07 Wednesday, October 12, 2011
Apparatus Clear Date and Time	14:10:00 Wednesday, October 12, 2011
Apparatus priority response	Yes
Number of People	3
Apparatus Use	1
Apparatus Type	11 - Engine
Personnel 1	K0623 - Linville, Kain M Position: FC
Personnel 2	K0925 - Lomeli, David J Position: FF
Personnel 3	K0972 - Whisnand, Seth Position: FE

Apparatus - USAR52	
Apparatus ID	USAR52
Response Time	0:14:05
Apparatus Dispatch Date and Time	11:29:02 Wednesday, October 12, 2011
En route to scene date and time	11:29:02 Wednesday, October 12, 2011

Incident Report

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Apparatus - USAR52

Apparatus Arrival Date and Time	11:43:07	Wednesday, October 12, 2011
Apparatus Clear Date and Time	14:10:00	Wednesday, October 12, 2011
Apparatus priority response	Yes	
Number of People	1	
Apparatus Use	1	
Apparatus Type	72 - Urban search & rescue unit	
Personnel 1	K0972 - Whisnand, Seth	
	Position: FE	

Apparatus - E54

Apparatus ID	E54	
Response Time	0:10:11	
Apparatus Dispatch Date and Time	11:31:21	Wednesday, October 12, 2011
En route to scene date and time	11:32:56	Wednesday, October 12, 2011
Apparatus Arrival Date and Time	11:43:07	Wednesday, October 12, 2011
Apparatus Clear Date and Time	14:09:59	Wednesday, October 12, 2011
Apparatus priority response	Yes	
Number of People	3	
Apparatus Use	1	
Apparatus Type	11 - Engine	
Personnel 1	K0747 - Knaggs, Jason E	
	Position: FC	
Personnel 2	K0823 - Reimers, Bevan C	
	Position: FE	
Personnel 3	K1065 - Buck, Nathaniel	
	Position: FF	

Apparatus - E51

Apparatus ID	E51	
Response Time	0:12:22	
Apparatus Dispatch Date and Time	11:31:21	Wednesday, October 12, 2011
En route to scene date and time	11:31:43	Wednesday, October 12, 2011
Apparatus Arrival Date and Time	11:44:05	Wednesday, October 12, 2011
Apparatus Clear Date and Time	13:44:33	Wednesday, October 12, 2011
Apparatus priority response	Yes	
Number of People	3	
Apparatus Use	1	
Apparatus Type	11 - Engine	
Personnel 1	K0643 - Crider, Martin R	
	Position: FC	
Personnel 2	K0669 - Padilla, Anthony	
	Position: FE	
Personnel 3	K1095 - Busby, Jordan J	
	Position: FF	

Apparatus - KB4B

Apparatus ID	KB4B	
Apparatus Dispatch Date and Time	11:31:21	Wednesday, October 12, 2011

Incident Report

Kern County

2011-1131690 -000

Apparatus - KB4B	
Apparatus Arrival Date and Time	11:54:14 Wednesday, October 12, 2011
Apparatus Clear Date and Time	13:43:54 Wednesday, October 12, 2011
Apparatus priority response	Yes
Number of People	1
Apparatus Use	1
Apparatus Type	90 - Single Resource OCA
Personnel 1	K0469 - Brothers, Vernell D Position: FBC

Apparatus - E55	
Apparatus ID	E55
Response Time	0:23:38
Apparatus Dispatch Date and Time	11:36:57 Wednesday, October 12, 2011
En route to scene date and time	11:37:27 Wednesday, October 12, 2011
Apparatus Arrival Date and Time	12:01:05 Wednesday, October 12, 2011
Apparatus Clear Date and Time	13:50:16 Wednesday, October 12, 2011
Apparatus priority response	Yes
Number of People	3
Apparatus Use	1
Apparatus Action Taken 1	32 - Provide basic life support (BLS) KCFD
Apparatus Type	11 - Engine
Personnel 1	K0576 - Wells, Michael B Position: FC
Personnel 2	K0969 - Guerra, Luis A Position: FF
Personnel 3	K1009 - Machado, Thomas Position: FE

Authority	
Reported By	K0747 - Knaggs, Jason E 00:00:58 Thursday, October 13, 2011
Officer In Charge	K0469 - Brothers, Vernell D 00:01:39 Thursday, October 13, 2011
Reviewer	K0747 - Knaggs, Jason E 00:01:42 Thursday, October 13, 2011

Narratives	
Narrative Name	CO55
Narrative Type	Incident
Narrative Date	13:58:11 Wednesday, October 12, 2011
Author	K0576 - Wells, Michael B
Author Rank	FC
Author Assignment	1
Narrative Text	Eng 55 on scene, IC assigned us to patient care. First two pts assisted with CPR and packaging. ENG and FF rode in with first pt to assist with pt care. CO55 monitored a third pt with Engr 54 until 3rd amb on scene.
Narrative Name	HM66
Narrative Type	Incident

Incident Report

Kern County

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Narratives

Narrative Date 17:34:45 Wednesday, October 12, 2011
 Author K0746 - Duncan, Aaron S
 Author Rank FC
 Author Assignment 1
 Narrative Text ADVISED IC TO RESPOND ENVIRONMENTAL HEALTH AND WAS CANCELLED ENROUTE.

Narrative Name Co52
 Narrative Type Incident
 Narrative Date 17:50:12 Wednesday, October 12, 2011
 Author K0623 - Linville, Kain M
 Author Rank FC
 Author Assignment 1
 Narrative Text on scene we supported ops with manpower, pt care, engineer attempted to monitor air (monitor failed to operate), brought air changer to scene, pts removed rapidly and air changer not set up due to rescue at hand. Assisted environmental health with additional monitoring of area interior and exterior.

Narrative Name Co 54
 Narrative Type Incident
 Narrative Date 22:52:22 Wednesday, October 12, 2011
 Author K0747 - Knaggs, Jason E
 Author Rank FC
 Author Assignment 1
 Narrative Text E54 was the first unit to arrive on scene at a reported rescue for a man down in the bottom of a drain pipe at Community Recycling. Upon arrival, I (Company 54) looked down into the cement drain pipe. I confirmed the en route reports that there were two pts collapsed in the bottom of the pipe. This vertical pipe was approximately 10 feet deep and 3 feet in diameter. I yelled down to the men in the pipe and did not get a response. Several nearby employees stated that the men were "passed out" for approximately 15 minutes prior to our arrival.

I named the incident the "Wheeler Incident" and assumed IC. E51 arrived on scene and a rescue plan was discussed. To mitigate the potential inhalation hazard, SCBAs were used. We removed a ladder that was previously in the pipe, and replaced it with a 14' roof ladder. Engineer 51 donned a SCBA and climbed down the ladder to make pt contact and secure each pt with a SCBA pack (without bottle) for hoisting. The balance of 51's and 54's crew acted as a haul team once the rope was securely fasten to the pts. The personnel at grade level near the top opening of the pipe was also equipped with SCBAs.

While setting up the extrication of the first pt, Batt 4 and USAR 52 arrived on scene. I briefed Batt 4 on our current rescue operation and he took command. He then assigned me "Operations" and Company 52 "Rescue Group". The IC cancelled HM66 and cancelled the air ambulance standby. E55 arrived on scene and was assigned to assist ambulance crews with pt care.

Shortly after both pts were extricated, a third pt whom was not inside the pipe required medical aid for chest pain. I assigned Company 55. See EMS narrative for pt care information.

Incident Report

Kern County

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Narratives

KC Environmental Health personnel arrived on scene after all pts had been transported to the hospital. They used monitoring equipment to measure the IDLH atmosphere in the drain pipe. The decomposing material at the bottom of the drain pipe produced gases that were highly concentrated in the confined space of the pipe.

An AAR was conducted.

Pt information was given to ECC on 10-13-2011 @ 0050 Hrs, per AP104.60

Narrative Name	CO 51
Narrative Type	Incident
Narrative Date	08:22:34 Thursday, October 13, 2011
Author	K0643 - Crider, Martin R
Author Rank	FC
Author Assignment	1
Narrative Text	E51'S CREW ASSISTED W/ THE RESCUE OPERATION. ALL MEMBERS OF E51'S CREW USED AN SCBA DURING THE RESCUE OPERATION. MC 0643

Narrative Name	Release to Public
Narrative Type	Incident
Narrative Date	08:57:09 Thursday, October 13, 2011
Author	K0604 - Weston, Doreen A
Author Rank	3179
Author Assignment	0
Narrative Text	Report released to US Chemical Safety And Hazard Investigation Board on 10/13/2011. Report released to Cal OSHA on 10/17/2011.

End of Report

EXHIBIT “C”

Exhibit C (only contains information regarding noted chemical other 66 pages removed)

This information is provided free of charge by the Department of Industrial Relations from its web site at www.dir.ca.gov. These regulations are for the convenience of the user and no representation or warranty is made that the information is current or accurate. See full disclaimer at http://www.dir.ca.gov/od_pub/disclaimer.html.

Subchapter 7. General Industry Safety Orders Group 16. Control of Hazardous Substances

Article 107. Dusts, Fumes, Mists, Vapors and Gases

Section 5155

TABLE AC-1
PERMISSIBLE EXPOSURE LIMITS FOR CHEMICAL CONTAMINANTS

Chemical Abstracts Registry Number (a)	Skin ^(b)	Name ^(c)	PEL ^(d)		STEL ^(e)		
			ppm ^(e)	mg/M ^{3(f)}	Ceiling ^(g)	ppm ^(e)	mg/M ^{3(f)}
7783064		Hydrogen sulfide	10	14	50 ppm	15	21

Footnotes to Table AC-1

(a) The Chemical Abstracts Service Registry Number is a designation used to identify a specific compound or substance regardless of the naming system; these numbers were obtained from the Desk Top Analysis Tool for the Common Data Base and from the Chemical Abstracts Indexes.

(b) Refer to section 5155(d) for the significance of the Skin notation.

(c) Trade Names Removed from Table AC-1.

(d) For the definition and the application of the Permissible Exposure Limit (PEL), refer to section 5155(b) and (c)(1).

(e) Parts of gas or vapor per million parts of air by volume at 25oC and 760mm Hg pressure.

(f) Milligrams of substance per cubic meter of air at 25oC and 760mm Hg pressure.

(g) Refer to section 5155(b) and (c)(3) for the significance of the Ceiling notation. A "C" notation in this column means the values given in the PEL columns are ceiling values. A numerical entry in this column represents a ceiling value in addition to the TWA values.

(h) A number of gases and vapors, when present in high concentrations, act primarily as asphyxiants without other adverse effects. A concentration limit is not included for each material because the limiting factor is the available oxygen. (Several of these materials present fire or explosion hazards.)

(i) Coal tar pitch volatiles (benzene or cyclohexane-soluble fraction) include fused polycyclic hydrocarbons (some of which are known carcinogens) which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the "coal tar pitch volatiles" standard.

(j) This standard applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willowing) and ginning. It does not apply to cotton gins, cottonseed oil industry, or operations covered by section 5190.

(k) A PEL of 0.05 ppm shall apply to exposures involving a mixture of ethylene glycol dinitrate and nitroglycerin.

(l) As sampled by method that does not collect vapor.

(m) Thermal decomposition of the fluorocarbon chain in air leads to the formation of oxidized products containing carbon, fluorine and oxygen. An index of exposure to these products is possible through their alkaline hydrolysis followed by a quantitative determination of fluoride content. No particular concentration limit is specified pending evaluation of the toxicity of the products but concentrations should be kept below the sensitivity of the analytical method.

(n) The concentration and percentage of the particulate used for this limit are determined from the fraction passing a size selector with the following characteristics:

<i>Aerodynamic Diameter in Micrometers (unit density sphere)</i>	<i>Percent Passing Selector</i>
0	100
1	97
2	91
3	74
4	50
5	30
6	17
7	9
8	5
10	1

Source: American Conference of Governmental Industrial Hygienists TLV Committee 1968 Proceedings.

(o) Refer to sections 5155(b) and (c)(2) for the definition and application of the Short Term Exposure Limit (STEL).

(p) (Reserved)

(q) Fibers per cubic centimeter of air at 25°C and 760mm Hg pressure. To be considered a fiber for this limit the glass particle must be longer than 5µm, have a length to diameter ratio of three or more, and have a diameter less than 3µm. The National Institute for Occupational Safety and Health (NIOSH), Method 7400, Issue 2, August 15, 1994, which is hereby incorporated by reference, shall be used for measuring airborne fiber concentrations.

(r) Compliance with the subtilisins PEL is assessed by sampling with a high volume sampler (600-800 liters per minute) for at least 60 minutes.

(s) The concentration and percentage of the particulate used for this limit are determined from the fraction passing a size selector with the following characteristics:

<i>Aerodynamic Diameter in Micrometers (unit density sphere)</i>	<i>Percent Passing Selector</i>
0	100
1	97
2	94
5	87
10	77
20	65
30	58
40	54.5
50	52.2
100	50

(t) Glutaraldehyde can cause occupational asthma and skin sensitization responses such as contact dermatitis. Exposure related symptoms may include one or more of the following: shortness of breath, chest tightness, wheeze, cough, skin rash, hives, and irritation of the nose, throat, skin or eye. Hazard communication training required by sections 5191 or 5194 shall address these health hazards and symptoms along with the measures taken by the employer to evaluate and control exposures that can include medical evaluations, exposure monitoring, ventilation systems, work practices, and personal protective equipment. The communication system required by section 3203 shall inform employees where to report possible health symptoms and where to ask questions, report concerns, and receive information about the employer's evaluation and control measures.

(u) This PEL applies to the sum of the exposures to the substance in the vapor state and from the particulate fraction specified in footnote (s) in this table.

Note: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 144.6, Labor Code.

EXHIBIT “D”

Exhibit D

H₂S Fact Sheet

An interesting diagnostic clue of extreme poisoning by H₂S is the discoloration of copper coins in the pockets of the victim. Treatment involves immediate inhalation of amyl nitrite, injections of sodium nitrite, inhalation of pure oxygen, administration of bronchodilators to overcome eventual bronchospasm, and in some cases hyperbaric oxygen therapy (HBO). HBO therapy has anecdotal support and remains controversial.

Exposure to lower concentrations can result in eye irritation, a sore throat and cough, nausea, shortness of breath, and fluid in the lungs. These effects are believed to be due to the fact that hydrogen sulfide combines with alkali present in moist surface tissues to form sodium sulfide, a caustic. These symptoms usually go away in a few weeks.

Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness.

- 0.00047 ppm is the recognition threshold, the concentration at which 50% of humans can detect the characteristic odor of hydrogen sulfide normally described as resembling "a rotten egg".
- Less than 10 ppm has an exposure limit of 8 hours per day.
- 10–20 ppm is the borderline concentration for eye irritation.
- 50–100 ppm leads to eye damage.
- At 100–150 ppm the olfactory nerve is paralyzed after a few inhalations, and the sense of smell disappears, often together with awareness of danger.
- 320–530 ppm leads to pulmonary edema with the possibility of death.
- 530–1000 ppm causes strong stimulation of the central nervous system and rapid breathing, leading to loss of breathing.
- 800 ppm is the lethal concentration for 50% of humans for 5 minutes exposure (LC50).
- Concentrations over 1000 ppm cause immediate collapse with loss of breathing, even after inhalation of a single breath.

Although respiratory paralysis may be immediate, it can also be delayed up to 72 hours.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Hydrogen Sulfide. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.