

## Air Pollution & Toxic Releases: 1992-2002

### Sampling of Reported Incidents at Shell Group Companies & Joint Ventures

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Aug 1992	Shell Oil Co. is fined \$9,500 by California's South Coast Air Quality Management District (AQMD) for emissions violations at the company's Carson, California refinery. Shell is cited for multiple violations, including excessive discharge of sulfur and nitrogen compounds and excessive gasoline vapors. The fine is among the top ten issued by the AQMD for August 1992. <sup>1</sup>
Jan 1994	Shell Oil Co. is fined \$5,750 by California's South Coast Air Quality Management District (AQMD) for emissions violations at the company's Carson, California refinery. Shell is cited for operating malfunctioning equipment contrary to permit requirements and for excessive volatile organic compound emissions. The fine is among the top eight penalties issued by the AQMD for January 1994. <sup>2</sup>
Aug 1994	Shell Oil Co. is fined \$8,500 by California's South Coast Air Quality Management District (AQMD) for emissions violations at the company's Carson, California refinery. Shell is cited for public nuisance violations from odors and operating a tank contrary to permit conditions. The fine is among the top eight penalties issued by the AQMD for August 1994. <sup>3</sup>
25 Aug 94	Shell Western E&P agrees to pay the US Environmental Protection Agency \$337,703 to settle charges that it violated limits for venting volatile organic compounds (VOCs) at its Belridge oil field in California from March 1988 through March 1993. Shell denied wrongdoing in the matter, maintaining it sought and received variances. <sup>4</sup>
27 Oct 94	"blown gasket" on river barge cell at Shell Chemical's Belpre, Ohio plant is the cause of 130 pounds of butadiene emissions, released to atmosphere; "equipment failure" noted in National Response Center report. <sup>5</sup>
1994	Shell Chemical plant in Norco, Louisiana is fined \$5,000 by the Louisiana Department of Environmental Quality for releasing 1,787 pounds of 1,3 butadiene and 1,189 pounds of benzene, charged to operator error. <sup>6</sup>
21 June 96	Shell's Norco, Louisiana refinery burns flare for 3 days, releasing 58,265 pounds of sulfur dioxide. Report indicates episode was "not preventable" — charged to "failure of electric motor due to faulty transformer." No fine. <sup>7</sup>
22 June 96	Shell's Norco, Louisiana refinery burns flare for one-and-a-half days, releasing 144,206 pounds of sulfur dioxide. Report indicates episode was "preventable" — i.e., "pressure point set wrong; inexperienced operators on duty." No fine. <sup>8</sup>
17 July 96	Shell Chemical unit, Synthetic Chemicals, Ltd., releases sulfur trioxide gas at the company's Knottingly, West Yorkshire in northern England, sending 10 people to the hospital with skin irritation and breathing complaints. The gas came from a leak in a storage tank and lasted a few hours before the tank was sealed. Residents of the local community were warned to stay indoors after a dense white cloud of sulphuric acid had formed. The warning was later lifted. The plant where the leak occurred then used toluene and other chemical solvents to manufacture fine and intermediate chemicals used in making pesticides and pharmaceuticals. <sup>9</sup>
5 Oct 96	Shell's Norco, Louisiana refinery burns flare for 9 days, releasing 442,350 pounds of sulfur dioxide. Report indicates that Shell first called the incident "preventable," but a Louisiana

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\***Note:** This 1992-2002 listing breaks out separately "emissions & releases" from those covered under all incidents in Appendix A of *Riding the Dragon*, and also includes *additional incidents* not included in the book or its appendix.

- DEQ inspector, after visiting the refinery, said the cause should be changed to “not preventable.” Release resulted from “severe fouling” because wrong solution introduced in refining process. No fine.<sup>10</sup>
- 6 Nov 96 US EPA, Region 5, proposes \$176,000 fine and files Administrative Order against Shell Chemical’s Belpre, Ohio plant for alleged hazardous waste violations. EPA alleged at the time that Shell failed to meet federal requirements related to burning hazardous waste in two industrial boilers. EPA charged that Shell failed: to monitor its equipment for air emissions leaks in a timely manner; to monitor or record the flow rate of coal; and to maintain its established electrostatic precipitator power, flue gas-flow rate limit, combustion temperature, total feed rate in the total feed stream, and total chlorine feed rate. Shell was burning liquid hazardous waste made up of several different source streams, including solvents and lubricant oils in two boilers.<sup>11</sup>
- 1996 Shell Chemical plant in Norco, Louisiana is fined \$2,500 by the Louisiana Department of Environmental Quality for releasing 164 pounds of benzene because hydrocarbon was inadvertently sent to the wrong tank.<sup>12</sup>
- 7 Jan 97 Shell’s Norco, Louisiana refinery burns flare for 5 ½ hours, releasing 53,525 pounds of sulfur dioxide. Shell says it wasn’t required to say if the incident was “preventable.” Severe fouling in one unit. No fine.<sup>13</sup>
- 7 Apr 97 Shell’s Norco, Louisiana refinery burns flare for 1 ½ days, releasing 100,500 pounds of sulfur dioxide. Report says incident was “not preventable.” Compressor shut down. No fine.<sup>14</sup>
- 10 Apr 97 Shell’s Norco, Louisiana refinery burns flare for 2 days, releasing 92,710 pounds of sulfur dioxide. Report says incident was “preventable.” Solution kept at wrong temperature; operator error. No fine.<sup>15</sup>
- 22 May 97 Shell’s Norco, Louisiana refinery burns flare for 5 days, releasing 133,200 pounds of sulfur dioxide. Shell says it wasn’t required to say if the incident was preventable. Poor quality of solution is suspected as the cause. No fine.<sup>16</sup>
- 3 June 97 Shell’s Norco, Louisiana refinery burns flare for 2 days, releasing 207,987 pounds of sulfur dioxide. Report says incident “not preventable.” Flame detector failed. No fine.<sup>17</sup>
- 2 Sep 97 yellow smoke cloud of silica dust and sulfur dioxide released by Shell’s Martinez, California refinery after FCCU malfunction.
- 12 Dec 97 Shell’s Norco, Louisiana refinery burns flare for 1 day, releasing 79,235 pounds of sulfur dioxide. Report says incident was “preventable.” Problems occurred when refinery shifted from diesel to gasoline processing modes; DEQ staff inspector said staff communication “could have been better.” No fine.<sup>18</sup>
- 6 Feb 98 the Shell/BP joint venture oil refinery in Durban, South Africa – the South African Petroleum Refinery(SAPREF) – has excessive flaring and smoke due to boiler tripping.<sup>19</sup>
- 9 Feb 98 valve failure at Shell’s East Site oil refinery in Norco, Louisiana necessitates flaring of “off-spec” ethylene/propylene; 712 lbs of NO-2 released.
- 9 June 98 a chemical release from Shell’s Norco ,Louisiana chemical plant forces the evacuation of a nearby baseball field at the Norco Elementary School, half a mile away, halting a girls’ softball game, after Shell officials requested the action with the release of tetrachloride at the plant that had formed a cloud of hydrochloric acid.<sup>20</sup>
- 31 July 98 the Shell/BP joint venture oil refinery in Durban, South Africa – the South Africa Petroleum Refinery(SAPREF) – has stack emission episode.<sup>21</sup>
- Nov 1998 Louisiana Department of Environmental Quality (DEQ) proposes to fine Shell Chemical \$330,000 for releases of ethylene oxide at its Geismar, Louisiana plant for infractions

- between May 21, 1996 through April 7, 1998. As of March 1999, Shell and DEQ were in negotiations regarding the resolution of these violations.
- 1998 Shell Chemical plant in Norco, Louisiana is fined \$2,500 by the US Environmental Protection Agency for not reporting the release of 162 pounds of nitrogen dioxide in a timely fashion.<sup>22</sup>
- March 99 Shell/Motiva refinery at Norco, Louisiana discloses to Louisiana DEQ that it has had major problems with its fugitive emissions program; subsequently submits a list of hundreds of unchecked components.<sup>23</sup>
- 9 Aug 99 EPA issues a Notice of Violation (NOV) to Shell for under the Clean Air Act for a bulk petroleum terminal the company owned in Bridgeport, Connecticut until Oct. 1, 1998. EPA also issued a NOV to the terminal's new owner, Motiva Enterprises (a Shell joint venture), for air pollution violations that continued. The terminal supplies gas and diesel fuel products to tank trucks for delivery to gas stations, and to marine barges. Shell had loaded a total of 28.4 million gallons of gasoline onto barges without the required vapor recovery equipment on seven days in 1997. This loading resulted in about 56 tons of uncontrolled volatile organic compounds (VOC) released to the atmosphere. A May 1999 EPA inspection also found that Shell had, in 1995, added an additional loading bay without getting a permit from the state Department of Environmental Protection, as required by law. The additional unauthorized bay had the potential to create 30 tons per year more VOC emissions. Motiva had also failed to apply for the necessary state permits. "Residents of Bridgeport already face more than their fair share unhealthy air conditions," said John P. DeVillars, EPA's New England Administrator at the time. "Shell, and now Motiva's failure to follow Clean Air Act regulations at their fuel terminal has only added to the problem. We expect the company to remedy its violations immediately."<sup>24</sup>
- Nov 1999 Shell's Norco, Louisiana plant is fined \$66,000 by the Louisiana DEQ for failing to check various valves and pumps at some 444 locations in the refinery for fugitive emissions.<sup>25</sup>
- 13 Dec 99 Shell Canada pays \$22,000 in fines in an Alberta provincial court after convictions on two violations of Alberta's Environmental Protection and Enhancement Act. The charges related to the failure of officials at Shell's Jumping Pound, Alberta sour gas plant to conduct two monthly biological effects tests according to required methods. The violations occurred in July and August 1995.<sup>26</sup>
- 1999 the Shell Chemical plant in Norco, Louisiana is fined for three separate incidents by the Louisiana Department of Environmental Quality: \$7,000 for releasing 80 pounds of allyl chloride vapor in 1998 because an accumulation vessel was overfilled; \$66,096 for missing fugitive emissions monitoring on more than 400 plant components over three months (Shell proposed performing a beneficial environmental project to substitute for this fine); and \$1,062 for releasing 84 pounds of allyl chloride vapor because of employee error. The Shell plant is also fined \$27,500 by the US Environmental Protection Agency for releasing 400 pounds of hydrochloric acid, but instead of paying the fine, the company financed improvements to the St. Charles emergency operations center at a cost of \$27,796.<sup>27</sup>
- March 00 local manager of Shell's Durban, South African joint venture refinery, SAPREF, admits the refinery has been under-reporting sulfur dioxide emissions to government authorities by as much as 25 percent over the past five years – or a rate equal to about 12 tons per day.<sup>28</sup>
- 2 June 00 Louisiana DEQ sends "notice of potential penalty" to Motiva's Norco, Louisiana refinery for air pollution violations in "26 areas of concern," including emissions violations that could number in the thousands, most regarding leaks of benzene and other chemicals.<sup>29</sup>

- 8 June 00 Martinez Refining Co., of Martinez, California (formerly Shell, now Motiva, Shell's joint venture) pays the San Francisco Bay Area Air Quality Management District \$90,000 in penalties for air pollution violations during the previous two years.
- 30 Mar 01 Shell's US operations reported more than 750 *accidental releases* of certain potentially harmful materials hazardous chemicals for the three years 1998, 1999, and 2000. Under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), companies are required to report such releases if the amount of the material released exceeds a certain threshold. Reportable releases can vary in quantity from one pound to five thousand pounds for each incident, depending on the hazard level and reporting threshold of the particular chemical involved.<sup>30</sup>
- 19 Jun 01 the Shell/BP joint venture oil refinery in Durban, South Africa – the South Africa Petroleum Refinery (SAPREF) – has “flare failure,” which results in release of unburnt gases, including a substantial amount of hydrogen sulfide into the local community.<sup>31</sup>
- 14 July 01 the Shell/BP joint venture oil refinery in Durban, South Africa – the South Africa Petroleum Refinery (SAPREF) – has failure of CD3 gasoil circulation pump (charged to operator negligence) which results in release of a volatile cloud.<sup>32</sup>
- 15 Aug 01 the Shell/BP joint venture South Africa Petroleum Refinery (SAPREF) in Durban, South Africa has failure at the refinery's bitumen blending area, resulting in the release of soot and hydrocarbons.<sup>33</sup>
- 14 Sep 01 the Shell/BP joint venture oil refinery in Durban, South Africa – the South Africa Petroleum Refinery (SAPREF) – has “flare failure,” which results in release of unburnt gases, including hydrogen sulfide.<sup>34</sup>
- 14 Oct 01 Shell's Martinez, California refinery (then run by Equilon) spews silica dust, hydrocarbons, and sulfur dioxide over the community after a catalytic cracking unit has start-up problems. Warning sirens are sounded as plumes of black smoke and pollution move off site, and residents are advised to “shelter-in-place” until the event had passed. Some 12,000 to 15,000 people in the community would later be warned by the county's emergency phone system.<sup>35</sup>
- 16 Oct 01 Ontario's Environment Ministry reports that Shell Canada has been charged under the Environmental Protection Act for air pollution.<sup>36</sup>
- 17 Oct 01 Shell's Martinez, California refinery – for the second time in less than a week – spews silica dust, hydrocarbons, and sulfur dioxide over the community after a catalytic cracking unit has start-up problems. Warning sirens are sounded as plumes of black smoke and pollution move off site, and residents are advised to “shelter-in-place.” More than 40 tons of pollutants, including partially burnt hydrocarbons, had rained down on the community in the two episodes. City and county attorneys began considering legal remedies.<sup>37</sup>
- 2 Jan 02 upset reported at Motiva's Port Arthur, Texas plant — pressure relief valve on the Propane Caustic Scrubber was relieved to the flare and about 19 pounds of nitrogen oxide were released.<sup>38</sup>
- 7 Jan 02 upset reported at Motiva's Port Arthur — a chlorine cylinder had a malfunctioning valve and about 12 pounds of chlorine were released.<sup>39</sup>
- 11 Jan 02 upset reported at Motiva's Port Arthur, Texas plant — cause unknown, but about 3,669 pounds of sulfur dioxide were released.<sup>40</sup>
- 21 Jan 02 upset reported at Motiva's Port Arthur, Texas plant — an analyzer on a boiler malfunctioned and more than 500 pounds of sulfur dioxide were released.<sup>41</sup>

April 2002	Motiva's Delaware City, Delaware refinery reports "upsets" or flaring involving the release of various pollutants including, SO-2, nitrogen dioxide, and/or smoke & soot on the following dates: April 10, 11, 12, 14, 15, 18, 19, 23, 24, 26, 27, and 29. <sup>42</sup>
5 April 02	Contra Costa County, California officials and the city of Martinez, indicate they may sue Shell for pollution from the company's Martinez refinery, claiming that chemical releases and pollution from the refinery have hurt property values, damaged the environment, and could cause future health problems. <sup>43</sup>
23 April 02	a caustic release from the Martinez, California refinery prompts Contra Costa County health officials to sound warning sirens directing residents to shelter in place. <sup>44</sup>
May 2002	Motiva's Port Arthur, Texas plant reports six "upsets" in May, releasing the following chemicals in approximate amounts: 614 pounds of nitrogen oxides, 4,345 pounds of carbon monoxide, 81,324 pounds of sulfur dioxide, 12 pounds of benzene, 55 pounds of nitrogen dioxide, 817 pounds of hydrogen sulfides, 2,746 pounds of ethylene, 1,576 pounds of propylene, 205 pounds of butene, 1,906 pounds of butanes/isobutanes, 805 pounds of pentanes/isopentanes, 378 pounds of propanes, 42 pounds of methane, and 33 pounds of ethane. <sup>45</sup>
May 2002	Motiva's Delaware City, Delaware refinery reports "upsets" and/or flaring involving the release of various amounts of sulfur dioxide, nitrogen oxides, and/or other substances on the following dates: May 2, 3, 4, 5, 15, 26, and 30. <sup>46</sup>
June 2002	Motiva's Port Arthur, Texas plant reports two "upsets" in June, releasing the following chemicals in approximate amounts: 51 pounds of nitrogen oxide, 3 pounds of nitrogen dioxide, 45 pounds of propane, 465 pounds of isobutane, and 210 pounds of carbon monoxide. <sup>47</sup>
June 2002	Motiva's Delaware City, Delaware refinery files "upset" reports involving the release of various amounts of sulfur dioxide, nitrogen oxides, and/or benzene on the following dates: June 2, 4, 11, 12, 14, and 30. <sup>48</sup>
28 Jun 02	catalytic cracking unit at Shell's Deer Park, Texas refinery has "upset"; additional flaring occurs to burn off hydrocarbons. <sup>49</sup>
July 2002	Motiva's Delaware City, Delaware refinery files at least two "upset" reports involving the release of sulfur dioxide (SO-2) – one on July 13 <sup>th</sup> releasing an unknown quantity of SO-2, and another on July 26 <sup>th</sup> releasing at least 500 lbs of SO-2. supplying the tank. Property damage was estimated in the "millions of dollars." <sup>50</sup>
Aug 2002	Shell's joint venture South African Petroleum Refinery (SAPREF) in Durban, South Africa releases some SO-2 and SO-3 from its refinery; some due to extra flaring and a power failure. <sup>51</sup>
Oct 2002	Shell/Motiva refinery in Norco, Louisiana spews oily substance over nearby residential area.. <sup>52</sup>
23 Oct 02	Shell's joint venture South African Petroleum Refinery (SAPREF) in Durban, South Africa has power cut, resulting in flaring and the odor of gases in nearby communities for about six hours. According to local residents, SAPREF claimed the gasses burnt off were harmless. <sup>53</sup>

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*Compiled by Jack Doyle for the Environmental Health Fund, November 2002. The incidents listed above are taken from the available public record, government reports, court records, company documents, and third-party reports. It is not a complete and comprehensive listing of all such incidents for Shell companies and joint ventures for the indicated period, or their resolution in every instance. Sources cited are believed to be reliable and accurate.*

## **Endnotes - Addenda #3 - Emissions & Releases**

1. "Top Air Pollution Penalties," *Los Angeles Times*, March 31, 1992, p. B- 2.
2. "Top Air Pollution Penalties," *Los Angeles Times*, May 11, 1994 p. B- 2.
3. "Top Air Pollution Penalties," *Los Angeles Times*, November 9, 1994, p. B- 2.
4. "Shell, Texaco To Fork Over Thousands to Settle With EPA," *Bakersfield Californian*, August 25, 1994, p. B-7.
5. Dow Jones International News, "Shell Oil Confirms 'Small Fire' at Netherlands Refinery," April 4, 1996.
6. "Getting Off Easy?," *Times-Picayune* (New Orleans), August 13, 2000, p. A-19.
7. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
8. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
9. Dow Jones Telerate Energy Service, "Shell Seeks Full Inquiry Into U.K. Chemical Plant Gas Leak," July 18, 1996, and, Dow Jones Telerate Energy Service, "U.K. Synthetic Chemicals May Be Prosecuted Over Gas Leak," October 23, 1996.
10. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
11. PR Newswire, "EPA Cites Two Ohio Companies, Proposes \$408,701 in Fines," November 6, 1996.
12. "Getting Off Easy?," *Times-Picayune* (New Orleans), August 13, 2000, p. A-19.
13. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
14. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
15. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
16. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
17. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
18. John M. Biers, "Fiery Flares Point To Questions About Safety," and sidebar, "Flaring With Impunity," *Times-Picayune* (New Orleans, LA), August 13, 2000, pp. A-16 and A-18.
19. *Southlands Sun*, February 1998.
20. Rhonda Bell, "Toxic Release Halts Games," *Times-Picayune*, June 9, 1998, p. B-3.
21. *Southlands Sun*, February 1998.
22. "Getting Off Easy?," *Times-Picayune* (New Orleans), August 13, 2000, p. A-19.
23. John M. Biers, "Blown Off," *Times-Picayune*, August 12, 2000, p. A-1.
24. U.S. Environmental Protection Agency — New England, "EPA Issues Notice of Violation to Shell Oil and Motiva in Bridgeport," EPA Press Office, August 9, 1999, 2 pp.
25. John M. Biers, "Shell Fined for Emissions Violations," *Times-Picayune*, November 24, 1999.
26. "\$20,000 in Fines For Shell in Pollution Conviction," Government of Alberta News Release, No. 99-087, December 22, 1999, 1 pp.
27. "Getting Off Easy?," *Times-Picayune* (New Orleans), August 13, 2000, p. A-19.
28. Tony Carnie, "Where There's Smoke, There's Fire," *Sunday Tribune News* (Durban, South Africa) May 5, 2002, p. 13.
29. John M. Biers, "Motiva Target of Criminal Probe," *Times-Picayune*, June 10, 2000, p. A-1.
30. Shell Oil Company, *Shell in the U.S. – 2000 Annual Report*, March 30, 2001, p. 41.
31. "Recent Industrial Accidents in South Durban," *Sunday Tribune*, May 12, 2002.
32. Reported in local press, by local residents, and by *groundWork*, in Durban, South Africa, July 2001.
33. Reported in local press, by local residents, and by *groundWork*, in Durban, South Africa, August 2001.
34. "Recent Industrial Accidents in South Durban," *Sunday Tribune*, May 12, 2002.

35. Denis Cuff and Yvonne Condes, "Second Leak Hits Martinez Refinery," *Contra Costa Times*, October 18, 2001, and, Jason B. Johnson, Charlie Goodyear & Erin Hallissy, "Refinery Spews Again - Martinez Residents Ordered To Take Shelter as Fumes Billow for Second Times This Week," *San Francisco Chronicle*, October 18, 2001, p. A-17.
36. Canada Stockwatch, "Shell Canada Charged With Air Pollution in Sarnia," October 16, 2001.
37. Denis Cuff and Yvonne Condes, "Second Leak Hits Martinez Refinery," *Contra Costa Times*, October 18, 2001; Jason B. Johnson, Charlie Goodyear & Erin Hallissy, "Refinery Spews Again - Martinez Residents Ordered To Take Shelter as Fumes Billow for Second Times This Week," *San Francisco Chronicle*, October 18, 2001, p. A-17; Yvonne Condes, "Martinez Refinery Draws Animosity," *Contra Costa Times*, April 11, 2002; and, Yvonne Condes, "Martinez Plans To Sue Shell Refinery," *Contra Costa Times*, April 5, 2002.
38. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
39. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
40. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
41. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
42. Testimony of Neil J. Carman, Ph.D. Former State of Texas Air Pollution Control Agency Regional Field Investigator, U.S. Senate Hearing, July 30, 2002, see: "Summary of Sixty-five Upsets, March-July 2002 , Three Delaware Refineries and Chemical Plants."
43. "Martinez Plans To Sue Shell Refinery," *Contra Costa Times*, April 5, 2002, and, "Martinez, County May Sue Shell Refinery Over Leaks," *San Francisco Chronicle*, April 6, 2002.
44. "Caustic Leak at Refinery; Sirens are Sounded After Material Blows Over," *Contra Costa Times*, April 24, 2002.
45. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
46. Testimony of Neil J. Carman, Ph.D. Former State of Texas Air Pollution Control Agency Regional Field Investigator, U.S. Senate Hearing, July 30, 2002, see: "Summary of Sixty-five Upsets, March-July 2002 , Three Delaware Refineries and Chemical Plants."
47. Reports of record, filed with the Texas Natural Resource Conservation Commission, as reported by Erin Koenig in *The Examiner*, an independent weekly based in Beaumont, Texas .
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50. Ron Nissimov, "Fuel Tank Explodes by Ship Channel," *Houston Chronicle*, August 18, 2002; Reuters, "Fuel Tank Explodes Near Houston Ship Channel," August 18, 2002; and, Associated Press, "Fuel Tank Erupts in Houston," August 18, 2002.
51. Report of local residents and *groundWork*, Durban South Africa, October 2002.
52. Report of local citizens and Louisiana Bucket Brigade, New Orleans, Louisiana, October 2002.
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