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## **Bayview-Hunters Point**

In this case study, we look at the efforts of residents of a local Bay Area community (the Bayview-Hunters Point area of San Francisco) to define the limits of redevelopment in their community. The case study more specifically focuses on the community's opposition to the siting of a natural gas, combined cycle cogeneration power plant. The case study expands upon and brings together a number of themes raised by prior case studies, as well as generating a number of new issues.

The proposed power plant would be built and operated by the San Francisco Energy Company (SFEC). SFEC is a limited partnership between AES Pacific, Inc. and Southern Natural Gas Company. Alan Ramo, an attorney who has represented portions of the Bayview-Hunters Point community in their opposition to the power plant, describes the factors that led to the proposed power plant:

San Francisco is served by local power plants and a single transmission corridor with multiple power lines. This corridor is both a blessing and a curse. The blessing is that it becomes feasible to island San Francisco in case of a transmission line upset anywhere beyond the San Francisco peninsula. This upset has occurred once this century. In such cases, PG&E with its current local operations can produce enough electricity to support 40% of San Francisco's needs, focused upon the downtown business and governmental center of the City. Bayview-Hunters Point and other residential communities would not receive any electricity.

The curse of the one corridor is that if the transmission corridor is damaged, such as from an earthquake or airplane crash, all external sources of

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electricity is cut off, leaving San Francisco with only its local power. This has also happened once this century, during the Loma Prieta quake; however, the same quake also interfered with the local power supply, darkening San Francisco.

PG&E determined it wanted to preserve its 40% capability [when two of its highest polluting power plant, both of which are currently located in Hunters Point, are shut down under new air quality regulations become effective in the year 2000]. Thus it proposed to the California Energy Commission and the Public Utilities Commission that it be allowed to renovate these units to meet air pollution requirements and produce a significantly greater amount of electricity. These agencies agreed to this request, during proceedings scarcely attended by any San Francisco residents and virtually unknown to residents in Bayview-Hunters Point.

[This was not the only force coming into play.] In a transition to a market approach to energy development, the [Public Utilities Commission] decided to determine how this San Francisco Aneed@ will be filled by holding an auction for Aqualified@ facilities. Qualified facilities mainly are those facilities which are deemed environmentally preferable due to the use of cogeneration or other favored technologies. They are not, unfortunately, environmentally benign. Nor is any consideration given to social issues, such as, whether a site will contribute to a disproportionate impact on communities of people of color.

At this point, SFEC enters the picture. SFEC participated in an Auction@ conducted by the [Public Utilities Commission] to see if any other party could produce this electricity more cheaply than PG&E. SFEC submitted the lowest bid and on January 10, 1994 was announced as the winner, subject to the company fulfilling various conditions required for a contract to sell electricity to PG&E.<sup>1</sup>

The SFEC facility would be a 221 megawatt natural gas-fired power plant. SFEC originally proposed putting the facility immediately next to residential areas in Bayview-Hunters Point. Later the Apreferred@ site was changed to a site owned by the Port of San Francisco and less than a 2 mile away from residential areas of Bayview-Hunters Point. SFEC would lease the Port site from the City of San Francisco.

The following article, written by a Stanford student in June 1996, provides a general overview of the power plant, the Bayview-Hunters Point community, the arguments in favor and against the power facility, and community efforts to block the power plant.

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<sup>1</sup> Alan Ramo, *Hunters Point: Energy Development Meets Environmental Justice*, ENVTL. L. NEWS, Spring 1996.

## California Energy Commission Proceedings & Decision

As noted in the overview of the Bayview-Hunters Point dispute, the California Energy Commission (the ACEC) has sole jurisdiction over the siting of power plants in the State of California. Local community groups only infrequently participate in CEC proceedings. Hiring an attorney can be very expensive, and the proceedings last for months and, in some cases, years. Here, two community organizations, the Morgan heights Homeowners Association and the Innes Avenue Coalition, had the good fortune to be represented for free by two environmental clinics. The Golden Gate University Law School Environmental Law and Justice Clinic represented Morgan Heights, and the Environmental Law Community Clinic associated with U.C. Berkeley's School of Law represented the Innes Avenue Coalition.

As part of the hearings, a number of Bayview-Hunters Point residents submitted written testimony expressing their concerns about the SFEC Project, including arguments that the proposed siting would be a violation of environmental justice. The community groups also presented a variety of expert witnesses, including:

- 👉 Dr. David Fairly, a statistician for the Bay Area Air Quality Management District (appearing as a concerned citizen, rather than in an official capacity)
- 👉 Dr. Gillis, a physician
- 👉 Dr. Mark C. Trexler, Senior Research Associate with Decision Science Research Institute, who testified concerning the disparate siting of energy facilities in communities of color
- 👉 Dr. Donald MacGregor, President of MacGregor, Bates
- 👉 Carl Anthony, head of the Urban Habitat program at the Earth Island Institute and one of the leading advocates of environmental justice in the nation
- 👉 Henry Holmes, of the Urban Habitat Program
- 👉 Luke Cole, an attorney with the California Rural Legal Assistance's Center for Race, Poverty, and the Environment who represented residents of Kettleman City in their fight against the incinerator studied in the last case study

One member of the Commission, or a panel of commissioners, presides over each proceeding. After conducting hearings and other analyses in a particular proceeding, the California Energy Commission arrives at its decision in stages. The presiding member or panel starts by preparing a proposed decision. After receiving comments, the presiding member or panel generally prepares a second, revised decision. Finally, the Commission as a whole issues a final decision.

In the Bayview-Hunters Point proceeding, a commission panel issued a revised decision in February 1996 approving the proposed project. The revised decision started out by noting that the public had been able to participate fully in the review and approval process. The Commission had held 42 public meetings or hearings, of which 26 had been in San Francisco, many in the Hunters Point neighborhood during the evening. The Commission had provided extensive direct-mail and published notice of all meetings, including multi-language newspaper noticing. There were also numerous collateral meetings with citizen groups and local government officials to discuss various aspects of the case. The revised decision concluded that it was unaware of any environmental review process which [has afforded] greater opportunity for public participation.

The revised decision then went on to conclude that the project would not have a significant adverse health impact on the local community and that the public would benefit from the project through employment opportunities and community investment.

The Commission believes that some of the public health fears and concerns expressed *about this particular project* during the hearings are not supported by the weight of the evidence. For example, concerning air quality and public health, the analyses of SFEC, the Bay Area Air Quality Management District (BAAQMD or Air District),<sup>2</sup> and Staff each show that the project complies with applicable state and federal air quality laws and will not cause any significant negative impacts either locally or in the Bay Area.

The powerplant is state-of-the-art when it comes to pollution control. There are no pathways to significant health impacts from this facility. It is a state of the art utility-scale combustion facility insofar as minimal emissions of pollutants. Widely accepted electricity industry computer models show that this project will displace pollution from older PG&E powerplants in San Francisco, other parts of the Bay Area, and Northern California. While it is true that there will be increased emissions from the project compared to those displaced from San Francisco plants, project emissions will be below a level of significance, even when added to the ambient air. As a result of purchasing emission offsets and displacing older more polluting PG&E powerplants, there will be a regional net air quality benefit. This in turn will reduce air-borne public health risks.

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<sup>2</sup> Editor's note: For purposes of implementing and enforcing the requirements of the federal clean air act, the nation is divided into a large number of air quality control regions. The local agency for the Bay Area is the BAAQMD.

The Commission believes that its process has brought forth evidence which is the most up-to-date and reliable health information upon which to make its Decision. On the basis of that information, the Commission can say that the project will be built and operated as safely as is possible. For example, in addition to reviewing criteria pollutants, the Air District, SFEC, and Staff independently conducted health risk assessments which confirm that there are no other emissions from the project which will cause a public health impact, including cancer. SFEC will also implement a state-of-the-art ammonia handling safety design and a thorough risk assessment to assure the project's safety, as well as to eliminate all credible risks to the public. In addition, with proper mitigation and construction practices, the project will not cause migration of contaminated soil or pollute the groundwater beneath the site. If anything, the construction of the project on the Port site may remedy any existing site contamination. No facts were introduced to effectively challenge these conclusions.

This project represents a \$186 million investment in the California economy. There are tangible benefits to San Francisco and Bayview-Hunters Point area, in particular. SFEC has committed in a Memorandum of Understanding (MOU) with a community-based organization to use its best efforts to employ half of its construction workforce from the local community. Virtually all of the local construction unions have signed an agreement to implement SFEC's pledge. Skeptics of this pledge argue that it is not ironclad and calls only for best efforts. The Commission believes that best efforts is meaningful in that it represents a positive opportunity for members of the community. Along with the community, the Commission will be monitoring SFEC's success in meeting its pledge.

On the financial front, the SFEC project will pay possessory taxes, in lieu of property taxes, of approximately \$2 million per year. Approximately half of this will go to the City's General Fund, with the remainder to different funds. Since the project is located on Port property, SFEC will make lease payments to the Port. The lease is for 30 years at a total of \$100 million. The lease includes an escalator clause, so the annual average payment is approximately \$3 million.

In addition to taxes and leases, SFEC, in accordance with section 37 of the Draft Port Lease, has offered to fund a community benefits package with a total contribution of \$13 million over the life of the project. SFEC proposes that disbursement from the fund be guided by a community-based organization on worthwhile community projects. With this fund, the people of Bayview-Hunters Point will have money available to do the things that the community wants done.

The next step after issuance of the revised decision would normally have been the issuance of a final decision by the Commission as a whole. Because the power plant could not be built until the San Francisco Board of Supervisors approved the leasing of the Port site,

however, the Commission decided to withhold a final decision until the City of San Francisco acted. As explained later, San Francisco ultimately chose not to lease the Port site (at least for the moment) and thus the Commission never issued a final decision. If San Francisco had issued a lease, however, the Commission almost certainly would have approved the project.

## Scientific Issues

As noted, one issue in the Commission proceedings was the safety of the proposed plant. As Alan Ramo explains, the safety question ended up focusing on the particulate emissions from the power plant.

The power plant in many respects represents improved technology over older power plants. It uses natural gas which in many respects is less damaging than coal or oil or nuclear energy. However, the power plant would operate every day of the year while PG&E's older facilities to be shut down were operated mainly as back-up facilities. As a result, the power plant maximum emissions for at least one pernicious pollutant, PM<sub>10</sub> (particulate matter less than 10 microns in size), would be about equal to the estimated amount of all of PG&E's current San Francisco operations.

PM<sub>10</sub> has been the subject of increasing focus of medical researchers across the country. Recent estimates suggest that 50-60,000 people die each year as a result of PM<sub>10</sub> exposure in the United States. In the San Francisco Bay Area, the [Bay Area Air Quality Management District's] statistician and expert for the Intervenors [i.e., the two community groups opposing the plant during the proceeding], Dr. David Fairly, estimated that achieving state PM<sub>10</sub> standards would save 1,260 to 2,940 deaths per year.

EPA is spending millions of dollars studying the issue and under court order is considering whether to issue more stringent standards for PM<sub>10</sub>. [In late 1994], EPA recommended that the agency consider regulating the smaller PM<sub>10</sub> particulates those less than 2.5 micrometers, which include PM<sub>10</sub> particles emitted by power plants. [EPA adopted new PM<sub>2.5</sub> standards in July of 1997.]

PM<sub>10</sub> is a fine dust or aerosol associated often with combustion that, because of its microscopic size, can penetrate deep into the lungs. It is believed that these particles cause or aggravate inflammation leading to cardiovascular disease and aggravation of existing respiratory diseases such as asthma and emphysema.

Whether the PM<sub>10</sub> emissions would impact locally was the subject of much dispute during the evidentiary hearings. [The Commission panel in its original proposed decision suggested] most of the PM<sub>10</sub> would blow towards the San Francisco Bay, not the community. The panel further contended that the

amount of the PM<sub>10</sub> would actually be less than the maximum, and the resulting exposure would be small and not be significant.

The panel also adopted a proposal by the company to plant grass in two nearby parks to reduce dust, equating playground PM<sub>10</sub> dust with combustion based PM<sub>10</sub> and therefore mitigating the emissions. They further contended that the impact of the project upon the entire PG&E system would be to reduce the use of other dirtier more expensive plants, thus reducing Bay Area wide pollution.

All of these Commission arguments are disputed by the Intervenors. AA little more@ PM<sub>10</sub>, which they contended could be almost a ton a week for a number of weeks, and additional carcinogenic chemical exposure is considered by the Intervenors quite significant in a community impacted already by industrial pollution. The whole question of cumulative impacts in the context of a community going through what the Intervenors believe is a health crisis is under examination. They dispute that planting grass in a playground is adequate mitigation for power plants derived PM<sub>10</sub>s, noting that the power plant PM<sub>10</sub>s are fine particles, PM<sub>2.5</sub>, believed by many leading PM<sub>10</sub> researchers to be the most dangerous. Finally, in an era of deregulation and market economics, they question whether any model can predict the impact of this project on the PG&E system during the 30 year expected life of the project.

During contentious and heavily litigated evidentiary hearings, countless other environmental arguments were the subject of direct and cross-examination. For example, the power plant site adjacent to the Bay contains toxic chemicals and is near a recognized toxic hot spot in the Bay in the area where people fish. The current plan to assure no toxics migrate from the site to the Bay, in apparently the spirit of the new Brownfields initiative, is, after some construction grading and moving of debris, to site a power plant and parking lot on top of the site, thus inhibiting the rainfall from infiltrating the site. The [California] Department of Toxic Substances Control contends in its draft Site Action plan that at this time there is no evidence of significant migration of chemicals and constructing the project will further diminish any possibility of such migration.

The site is located in young bay mud, the kind of mud that liquefied and caused extensive damage during the Loma Prieta shake. SFEC contends that by sinking pilings into the soil and other seismic design it can resolve these problems. The design, however, will be created only after certification, subject to a peer review committee monitored by the CEC. The Intervenors believe they should see the design now to assure their protection.<sup>3</sup>

Central to the community's challenge to the safety of the plant was the testimony of Dr. David Fairley concerning particulate emissions. Following this page are: (1) the direct written

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<sup>3</sup> Alan Ramo, *Hunters Point: Energy Development Meets Environmental Justice*, ENVTL. L. NEWS, Spring 1996.

testimony of Dr. Fairley, and (2) questioning and cross-examination of Dr. Fairley by the hearing officer, SFEC=s attorney, and the Commission=s staff. This testimony should give you a good sense of expert testimony in environmental disputes. Notice in particular the high degree of uncertainty involved in virtually all of the factors to which Dr. Fairley testifies.

### **The Commission=s Revised Proposed Decision**

The revised proposed decision of the Commission dealt with health issues in two sections. One section dealt with the technical air pollution issues; the second section dealt generally with public health concerns (although with a specific focus on the particulate issue addressed by Dr. Fairley). Both sections are excerpted below.

[Insert p. 288 (255)]

## Three Updates

### 1. The SFEC Power Plant

In the Spring of 1996, Alan Ramo provided the following status report on the SFEC power plant:

While the environmental issues were debated, further developments in the world of energy regulation were overtaking the project. SFEC claimed that because it won the auction, it had a binding contract with PG&E. However, PG&E claimed that SFEC had not demonstrated site control in the required time period, allegedly a prerequisite for a contract. California public utilities and other out-of-state utilities challenged the auction that seemed to authorize SFEC to seek certification for this project before the Federal Energy Regulatory Commission (FERC). Under federal law, this Commission has advisory authority over actions deemed contrary to federal energy policy. FERC declared the auction illegal, in part because it was not fully competitive.

The California Public Utilities Commission (CPUC) had, at the request of PG&E, stayed the auction as it affected Hunters Point pending the outcome with FERC. PG&E and SFEC have been in negotiations. . . .

[As noted earlier, the California Energy Commission in March 1996 issued its revised proposed decision, but] decided to withhold its final decision until the City of San Francisco decides to go ahead with its lease of the Port site for the project, a decision which requires the approval of the San Francisco Board of Supervisors. While still allowing a majority to impose upon a minority of the City, it puts elected officials who are closer to the community in the driver's seat for the ultimate CEC decision, a step closer to the notion of environmental justice that gives importance to community participation. The panel also required SFEC to resolve its differences with PG&E, either through CPUC action or a court decision.<sup>4</sup>

Opponents of the proposed power project had already begun to lobby the City of San Francisco. First, they asked the City Council to pass a resolution urging Mayor Willie Brown to ask all city agencies and officers to refrain from taking any actions that might advance the development of a new power generating facility in the Bayview-Hunters Point community. (Brown, who long opposed construction of the power plant, supported the resolution.) Second, they asked the City Council to adopt a temporary moratorium on the development of any new, or the expansion of any existing, industrial facility located in the Bayview-Hunters Point community.

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<sup>4</sup> Alan Ramo, *Hunters Point: Energy Development Meets Environmental Justice*, ENVTL. L. NEWS, Spring 1996.

On June 17, 1996, the City Council unanimously passed the resolution. According to Supervisor Angela Alioto, who introduced the resolution, "The Bayview-Hunters Point community has been the dumping ground of San Francisco, and that finally will end today." The City Council, however, did not adopt the moratorium.

Although passage of the resolution virtually ensured that SFEC would not be able to build the power plant on the proposed Port site, the partnership vowed to push forward with its plans to build the power plant somewhere in the vicinity of Bayview-Hunters Point. According to news articles reporting passage of the resolution, the San Francisco Energy Company contended that a new Hunters Point plant would actually decrease air pollution because PG&E's two World War-II era power plants could then be shut down. According to a San Francisco Energy Company official, "A new plant would make things better because we have newer, more efficient technology. They've only listed to one side of the story. Nowhere do experts say that natural gas causes cancer."

Despite the passage of the City Council's resolution, environmental concerns about power plants in the community continue to plague Bayview-Hunters Point. In late 1996, pursuant to the legislature's enactment of an energy deregulation program and the California Public Utilities Commission's (CPUC's) request that PG&E divest at least 50% of its fossil fuel plants, PG&E requested the CPUC approve the sale of its Hunters Point facility. The community at Bayview-Hunters Point opposed the sale because of its belief that a new owner under deregulation would be more likely than PG&E to run the facility at a greater capacity, increasing its emissions. Further, it feared that under the new deregulation operating scheme, ratepayers funds would be allocated to maintain operations of this so-called "must-run" plant, rather than invest in transmission upgrades which would allow full competition to render this older dirtier facility obsolete due to the expense of its operation. After hearings on the issue of whether an Environmental Impact Report under the California Environmental Quality Act was required for the sale, PG&E withdrew its request for authorization to sell the Hunters Point Power Plant. However, in doing so, PG&E also stated that it will be including the facility in the application it planned to file in the near future for the authorization to sell its remaining power plants in the Bay Area.

## **2. New EPA Particulate Standards**

In June 1997, as noted earlier, the Environmental Protection Agency adopted new regulatory standards for PM<sub>2.5</sub>. The PM<sub>2.5</sub> regulations set an annual limit of 15 micrograms per cubic meter and a 24-hour limit of 65 micrograms per cubic meter. An air quality region thus must not exceed 15 micrograms on an average annual basis and cannot exceed 65 micrograms during any 24-hour period. The 65 microgram standard in the final regulations constitute a slight weakening of the 50 microgram limit that EPA originally proposed in its draft regulations. The final regulations give EPA five years to set up a monitoring program. Areas currently not in compliance with the new standards will have three years to develop and submit plans on how

they will meet the standards. EPA then has a year and a half to review the implementation plans. Not surprisingly, industry has raised legal challenges to the new regulations.

Several weeks before EPA issued its final regulations, the *Los Angeles Times* published the following story detailing the debate over the new air quality standards:

When tiny particles of pollution descend on a city, everything--skyscrapers, mountains, the horizon--drowns in a sea of soot that can persist for days and stretch for miles.

But something more ominous happens too. Death counts rise. People who might have survived a heart attack or bout of pneumonia or other illness are more likely to die.

Scientists consider the link between airborne particles and premature deaths about as compelling and well-documented as any finding can be. But even they are debating the merits of a Clinton administration plan to force a nationwide cleanup--staggering in scope and cost--when fundamental questions remain about why the microscopic particles seem to be killing people.

Although severe pollution has long been known to be harmful and even lethal, only in the last few years have researchers made the surprising discovery that deaths seem to be tied to the moderate particle pollution found in many cities today. But how can a fairly small dose hasten a person's death? How can pieces of pollution made up of chemicals that are vastly different from city to city all be dangerous? And is it wise to mount a massive national effort to tackle the threat while such scientific mysteries linger?

The move by the U.S. Environmental Protection Agency to tackle one of the nation's most pervasive urban pollutants raises profound dilemmas for public health policy, focusing on how much danger is acceptable, how much proof of harm is needed, and how far health officials should go in an effort to protect lives. The answer winds up a judgment call, even for medical experts.

"You have to be willing to err on the side of being very careful, because the penalty for being wrong is that you've done nothing about a problem responsible for thousands of deaths per year," said Dr. Philip Bromberg, director of University of North Carolina's Center for Environmental Medicine and Lung Biology. "When you deal with public health, you accept less certainty for a basis for action."

But University of Rochester toxicologist Gunther Oberdorster, who does research exposing lab animals to fine particles, disagrees. He said that setting new limits "is the wrong thing to do at this time" and should be postponed until scientists can nail down what makes tiny specks of pollution dangerous and which are the most potent types that warrant cleanup.

In November, the EPA proposed a new health standard that, for the first time, would limit the volume of ultra-fine particulates allowable in the air. One of the most far-reaching environmental proposals to emerge in a decade, it has triggered a bruising battle and fervent opposition from the oil and auto industries and others, as well as from many members of Congress, governors and mayors in both political parties. A court order requires the EPA to set final standards by July 19.

An estimated 167 counties nationwide—including nearly all of Southern California—would violate the agency's proposed limit. Once standards are set, those areas have up to 15 years to cut pollution, most likely from trucks, cars, power plants, factories and wood smoke.

The EPA estimates the national cost at \$ 6 billion a year, starting in 2007, while industry groups predict it will soar as much as 10 times higher.

The Los Angeles Basin, often veiled with gray-brown soot, faces the biggest burden. Even EPA Administrator Carol Browner acknowledges that California will probably need to find replacements for diesel fuel, which powers everything from generators to trucks, trains and ships. Midwestern states reliant on coal-fired power plants also would be hit hard.

The focus of the debate is an amorphous, complex blend of chemicals such as sulfates, carbon, nitrates and minerals. They have one thing in common: They measure less than 2.5 microns in diameter, much finer than a human hair or grain of sand. The EPA currently restricts only coarser particles, less than 10 microns, which come mostly from dust.

Virtually everywhere epidemiologists have looked, deaths and hospitalizations from heart and respiratory ailments increase on days when particle pollution rises. Such consistency in epidemiology is so rare it's striking. Among the cities studied are Los Angeles, New York City, Philadelphia, Detroit, Chicago, Santa Clara, Seattle, Denver and Provo, Utah.

Based on those studies, an estimated 64,000 Americans are believed to be dying every year because of particulates. EPA officials say their proposed standard would save 15,000 of those lives and prevent several hundred thousand asthma attacks and bronchitis cases yearly.

Speaking at a medical conference in San Francisco last month, Terry Gordon, an associate professor of environmental medicine at New York University's School of Medicine, said these "silent extra deaths" make particles as deadly as if an airliner crashed each time pollution rises.

Some scientists say the danger is so clear and the evidence so persuasive that the public deserves protection as soon as possible. Twenty-seven scientists—including some of the most prominent researchers in environmental medicine—sent a missive to President Clinton in January urging stringent standards.

But other scientists are skeptical about whether particulates are really the culprit for premature deaths, since no one knows why relatively modest doses could be lethal. They cannot at this point identify what may make fine particles capable of killing, especially when their chemical composition varies greatly, depending on whether they are emitted by cars, trucks, factories or fires. For instance, fine particles on the East Coast are largely sulfur, while California's are mostly nitrates and carbon from gasoline and diesel.

"I am very well convinced that we are showing links between day-to-day numbers of deaths and air pollution. And the weight of the evidence indicates . . . particles seem to be responsible," said Jonathan Samet, chairman of epidemiology at Johns Hopkins University's School of Hygiene and Public Health. "But," he said, "particles are a mixture. Do we know enough about the characteristics that may be causing the health damage so that we know what to regulate? These are some of the difficult issues we face."

Some toxicologists contend that the EPA standards carry such a high cost that they should wait until these riddles are solved—a breakthrough, probably at least five years away, that could help pinpoint a solution with less severe economic consequences. Compared to the cost of regulation, the cost of additional science would be trivial, they say.

"It's very important to first find out why particles are toxic," said Robert Phalen, director of UC Irvine's Air Pollution Health Effects Laboratory.

For any individual venturing outside on a polluted day, the risk is small. But because millions of people breathe the minute particles, the overall death and illness count can grow substantially.

Numerous studies have found that deaths rise 1% to 5% among the general population on days when particulates increase by a moderate amount. That amounts to 10 deaths per day in an area the size of Los Angeles County or New York City, or 300 people along the entire East Coast during a three-day episode.

In eastern Los Angeles County alone, the EPA calculates that 800 people died prematurely in 1995 from cardiopulmonary ailments aggravated by pollution. Riverside residents face the highest risk because particles are more voluminous there than in any other urban area in the country.

During severe sieges, there is no doubt particulates can kill. In London in 1952, about 5,000 people died during a weeklong fog of coal smoke that soared to concentrations 40 times worse than anything measured today. Deadly particle fogs also struck a Pennsylvania valley in 1948 and Belgium in 1930.

But it wasn't until the early 1990s that scientists linked deaths to the much lower pollution levels found in modern cities.

In more than 20 separate studies, researchers, dominated by a Harvard University team, examined tens of thousands of hospital records and death certificates in various cities and compared them with pollution conditions. Consistently, deaths were higher in the most polluted cities and on days when volume of particles increased.

"We're convinced this is more than some oddball statistical nicety," said John Bachmann, the EPA's associate director of science policy. "It's not as strong as cigarette data showing a high cancer rate. But we have three or four lines of evidence to suggest death from particulates isn't just a statistical fluke."

Still, some medical researchers and toxicologists remain suspicious because, over a lifetime, a minuscule volume of particles are deposited in a person's body—probably less than a gram.

Toxicologists began trying to answer these questions just in the last few years. So far, they have been unable to figure out how particles damage the heart and lungs or how to replicate the deaths in healthy lab animals exposed to different compounds.

The danger is partially because of the particles' size—the tiniest ones may irritate nerve endings that affect the heart and penetrate deep in the lungs. But some suspect that the real danger comes from acids that cling to some particles, while others believe it is metals such as iron, lead and zinc.

Medical experts also cannot pinpoint whether people with illnesses are having their lives shortened by days, weeks or years and what happens to people exposed over a lifetime.

Determining how particles can kill is of critical concern to those outside the laboratory as well. As states and cities across the nation frame multibillion-dollar strategies to clean the air over the next decade, they would prefer to know which sources to target to get the biggest bang for their bucks.

Phalen of UC Irvine said the economic and social impacts are so great it is premature for the EPA to limit particles based on mass when the real danger could be some hidden compound that attaches itself to a select group of them.

But EPA and many other health officials say too many lives are at stake to wait. Browner, the EPA's administrator, compared it to the cigarette industry saying health warnings shouldn't have been issued until scientists knew exactly how smoking causes cancer.

"If we had done something like that with leaded gasoline or tobacco smoke, years would have gone by," she said.

The Clean Air Act requires the EPA to set standards providing "an adequate margin of safety" for all Americans, based on current science. But what if scientists are at odds? Of 21 scientists convened by EPA, 19 recommended that the agency limit ultra-fine particles. The 19, however, disagreed or wouldn't give opinions on how stringent it should be, leaving Browner to reach her own conclusions.

The EPA's proposal is "defensible but also attackable" on scientific grounds, said Bromberg of the University of North Carolina. Still, he believes a strong call for action is merited when the recent mortality findings are combined with lessons from the past, especially during the London fog.

Because particles are already declining in most cities thanks to smog-fighting efforts, some scientists, including Oberdorster of the University of Rochester, say new standards can wait.

The EPA standards, however, are designed with the more distant future in mind. After they are set in July, states and cities will have until 2002 to craft cleanup strategies, then eight to 10 years to implement them. By then, Browner said, scientists will have uncovered new clues to unravel the mysteries.

"To be honest with you, I don't think the challenge of cleaning up particulates is small," she said. "But we should not in this country walk away because we don't know the answers."

The *Los Angeles Times* article also provided the following listing of the major sources of particulate matter smaller than 2.5 microns:

Nitrates: Mostly car and truck exhaust. Also factories.

Sulfates: Coal-fired power plants, factories, boilers

Carbon: Diesel vehicles and equipment, fires, woodburning

Soil/minerals: Paved roads, construction, erosion, farm tilling

Ammonium: Fertilizer, manure, sewage plants

### **3. General Health Conditions in Bayview-Hunters Point**

The paper by Diana Popek at the beginning of this case study notes that a cancer study performed by the San Francisco Department of Health concluded that African American women under 50 in Bayview-Hunters Point have a breast cancer rate double that of women in the Bay Area as a whole. (Other studies, which recently have been disputed, have suggested that white women in the Bay Area have the highest incidence of breast cancer in the world.) In June 1997, doctors from the University of California at San Francisco and the City of San Francisco's Health Department released a new study examining hospitalizations for chronic illnesses in 1991 and 1992. The study found that hospitalizations were nearly four times higher than the state average. According to the *San Francisco Chronicle*, the study found that

hospitalization rates for asthma, congestive heart failure, hypertension, diabetes, and emphysema were 138 per 10,000 in Bayview-Hunters Point. The next highest level in San Francisco was among residents of the South of Market area, with a rate of 92 per 10,000. The statewide average was 37 per 10,000.

Hospitalization rates were dramatically higher in Bayview-Hunters Point in all but one category, childhood asthma, with the Tenderloin having equally high levels. Rates for hospitalization and premature death for children were also markedly higher in Bayview-Hunters Point than the state average.

Chronic illnesses of these types are generally attributable to a myriad of factors, including genetics, diet, access to health care, and the environment. As it's hard to say one factor is the biggest problem, said Kevin Grambach, a UCSF researcher who headed the study. But I would not be adverse to saying the environment is a smoking gun. Certainly, there's evidence that pollution makes asthma and heart failure worse.

Immediately after the study was released, two San Francisco supervisors called for hearings into the health of residents of Bayview-Hunters Point. Supervisor Amos Brown said that it was time to clean up the neighborhood. The quality of life there should no longer be the victim of the paralysis of analysis.

### **Questions for Thought**

\*1. In the Commission proceedings that you have read, Dr. Fairley testifies that PM<sub>10</sub> is hazardous at much lower levels than previously thought. Indeed, he testifies that two recent studies of PM<sub>10</sub> would predict that the power plant would result in an increase of 2 to 6 deaths per year. Dr. Fairley also testifies that PM<sub>10</sub> impacts are going to be worse locally than in distant parts of the Bay Area. Finally, he testifies that sodding two playgrounds will not offset the health effects of the expected increase in particulate emissions. Yet the Commission, in its

revised proposed decision, concludes that the project will not result in a significant impact to air quality, that the project will actually decrease  $PM_{10}$  because of its ratioed offsets of  $PM_{10}$  precursors and its displacement of other  $PM_{10}$  emissions from older Bay Area plants in PG&E's system, and that resodding two playgrounds proximate to the project can reasonably be expected to far exceed local  $PM_{10}$  from the project.

Why does the Commission reach a different conclusion from that of Dr. Fairley? Does the Commission reject the studies and data on which Dr. Fairley relied? Does the Commission interpret the studies and data differently? Does the Commission find other information more relevant? Do you agree with the Commission's conclusions regarding particulates? If not, what do you believe are the errors or mistakes in the Commission's analysis? Are the errors or mistakes factual (e.g., do they misinterpret or ignore important data) or are the errors or mistakes issues of policy (e.g., how to resolve uncertainties over the potential health effects)?

\*2. Review Dr. Fairley's credentials. He is a statistician for the Bay Area Air Quality Management District and has a Ph.D. in statistics from Stanford. During Mr. Varanini's cross-examination of Dr. Fairley, Fairley testifies that he has a little academic training in epidemiology and no training in a variety of health fields. Should the Commission have permitted Dr. Fairley to testify regarding the potential health effects of particulate emissions? Should the Commission have restricted what Dr. Fairley could testify about? Should the Commission have discounted some or all of Dr. Fairley's testimony in light of his background? Explain.

Assume that a local community organization had surveyed local residents of Bayview-Hunters Point and wanted to testify that residents reported that they suffered far more health complaints on days when the existing PG&E facilities operated than on the days when the facilities do not operate? (Assume that the residents can tell when the facilities are operating by looking to see if any smoke is coming out of the facility stacks.) Should the Commission permit the testimony? Should the testimony be discounted because the members of the local community group do not have any scientific training? Do you believe that the Commission should treat the testimony of the community group any differently than the testimony of Dr. Fairley? Why, or why not?

\*3. Much of Dr. Fairley's testimony concerns the possibility for offsetting emissions from the proposed power facility with reductions in emissions elsewhere. Dr. Fairley testifies that the power plant would emit as much  $PM_{10}$  as (1) 500 typical fireplaces, (2) slightly less than 2,000 urban diesel buses, and (3) 170 playgrounds. Dr. Fairley also appears to concede that the current PG&E power facilities emit more  $PM_{10}$  than the proposed facility would emit. Assuming that Dr. Fairley is correct in his evaluation of the health effects of the proposed facility, do you believe that the government should permit the proposed facility to be built and operated if:

- (a) SFEC pays San Francisco to replace over 2,000 urban buses with electric buses?
- (b) SFEC resods 200 playgrounds in San Francisco?

(c) as part of a deal to get the new power facility, PG&E agrees to close down its current power facilities in Bayview-Hunters Point?

(d) as part of a deal to get the new power facility, San Francisco bans the use of all wood-burning fireplaces in the City?

\*4. [Note: Students writing up this case study should not answer both Questions 3 and 4, given their close similarity.] When the hearing officer presses Dr. Fairley for ideas of any way that SFEC could mitigate the potential health impact of increased particular pollution, Dr. Fairley testifies that one way would be to provide the community with money for economic revitalization. According to Dr. Fairley,

poverty is a big source of health problems. In fact, for example, there was a recent article in the New York Times that said the area the Bronx had eight times as high asthma levels as, you know, the national average. And although they were not totally sure of what the problem was, they targeted, they said it is probably poverty. And so an alternative would be some kind of economic benefit for the areas that are being impacted by that power plant.

So my idea was that supposing you had the SF Energy Company put out X dollars, and I am not sure what X would be, as seed money for a diesel -- not -- electric bus manufacturing facility. Now, and the facility would be required to hire a certain percentage of people from within the impacted areas.

It seems to me that the offset of additional jobs, additional economic vitality might be, I mean, it is clearly a practical trade off and not something that is scientific trade off. I mean, you could not do a cross-benefit analysis to justify it, but it might be a kind of practical compromise that, you know, could solve the problem. At least that is what I thought.

What do you think of Dr. Fairley=s idea? Should the government permit projects that are certain to increase health risks to local populations if the projects bring in significantly more income to the local population? What would be your response to the following excerpt from a judicial opinion considering whether the federal Occupational Health & Safety Commission should engage in cost-benefit balancing in deciding what occupational health standards to adopt?

[E]ven where the application of cost-benefit analysis would result in less stringent regulation, the reduced stringency is not necessarily adverse to health or safety. More regulation means some combination of reduced value of firms, higher product prices, fewer jobs in the regulated industry, and lower cash wages. All the latter three stretch workers= budgets tighter (as does the first to the extent that the firms= stock is held in workers= pension trusts). And larger incomes enable people to lead safer lives. One study finds a 1 percent increase in income associated with a mortality reduction of about 0.05 percent. Another suggests that

each \$75 million costs generated by regulation may, under certain assumptions, induce one fatality. Larger incomes can produce health by enlarging a person's access to better diet, preventive medical care, safer cars, greater leisure, etc. [International Union, UAW v. OSHA, 938 F.2d 1310 (D.C. Cir. 1991) (Williams, J., concurring).]

\*5. There is frequently a great deal of uncertainty concerning the potential health effects of a new facility or product. How should any uncertainty regarding the health effect of the proposed power facility in this case be resolved? Why? What do you think of the following proposal excerpted from *Environment & Health Weekly* (a newsletter focusing on environmental justice)? How would you apply the proposal to this case study? Do you think the idea of flexible assurance bonding is a good one? Why, or why not? Would you advocate the idea on behalf of the residents of Bayview-Hunters Point?

In recent years, Robert Costanza, an economist at University of Maryland, has been exploring ways to improve environmental decision-making under conditions of uncertainty. One goal of his work is to make the precautionary principle (including the principle of reverse onus), and the polluter pay principle, more useful in the real world.<sup>5</sup> Costanza's idea is formally known as flexible assurance bonding but sometimes it is called A4P (The precautionary principle pays principle).

Costanza's idea is derived from two common concepts: performance bonds, and bottle deposit laws. Bottle deposits are simple and familiar -- you leave a nickel deposit whenever you buy a soft drink in a bottle and you get your nickel back when you return the empty bottle. Performance bonds are common in the construction industry. Before a job begins, a construction company puts up a bond. A certain amount of money that is held by a third party. If the construction is completed satisfactorily and on time, the bond monies are returned to the construction company. On the other hand, if the work is unsatisfactory, or is late, part or all of the bond will be forfeited.

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<sup>5</sup> Editor's Note: The precautionary principle says that Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. The principle of reverse onus says that the burden of proof for safety belongs on the proponent of a new facility, technology, or substance, not on the general public. The polluter-pays principle says that someone who causes environmental harm should have to pay for that harm.

Costanza has combined these two ideas into an assurance bond, similar to a performance bond. Here is how it would work: Before someone introduced a new chemical, or a new technology, they would estimate the worst-case consequence of their act. The proponent would then put up an assurance bond to cover the current best estimate of the largest potential future environmental damages. The bond would be held in an interest-bearing escrow account; the bond would be returned to the proponents after the uncertainties were reduced and it was clear that their actions would not cause harm. Alternatively, if harm occurred, the bond would be used for environmental restoration, and to pay damages to anyone who had been harmed.

This plan provides the following benefits:

- 👉 It creates an incentive for the proponent of a project to conduct research to reduce the uncertainties about their environmental impacts. If they could show that the worst case was very unlikely to happen, part of their bond would be refunded to them. The proponent would thus have an incentive to fund independent research or, alternatively, to change to less damaging technologies. (A quasi-judicial body would have to be created to resolve disputes about when and how much of the bonds should be refunded.)
- 👉 This plan puts the burden of proof on the economic agent that stands to gain from a new chemical or new technology, not on the public.
- 👉 In keeping with the precautionary principle, this plan requires a commitment of resources up front to offset the potentially catastrophic future effects of current activity.
- 👉 It is consistent with the principle that the polluter should pay .... The 4P plan requires the polluter to pay for uncertainties, as well as for environmental damage.
- 👉 By this plan, proponents of new technologies are not charged in any final way for uncertain future damages. They can recover portions of their bond (with interest) in proportion to how much better their environmental performance is than the predicted worst-case scenario.

The bonds could be administered by an existing agency, such as EPA ..., or a completely new agency could be created for the purpose. ....

The 4P system seems logical, fair, and economically efficient. It creates market incentives for good behavior, and for continuing innovation to minimize environmental damage. It acknowledges uncertainties up front, rather than denying their existence. And it employs science to evaluate worst cases, which science is better-suited to doing than it is to determining Asafety.@ Furthermore, the 4P approach provides a practical way of implementing the precautionary principle and the principle that the polluter should pay.

6. Given the extent of the toxic chemical contamination that already exists in Bayview-Hunters Point, should a new power plant be permitted to be built in the community? Even if existing scientific analysis produces no evidence to show that the siting would pose a health or safety risk?

7. Not all members of the Bayview-Hunters Point community oppose the siting of the power plant. Hunters Point is an economically depressed area and some in the community think that the power plant would bring much needed jobs to Hunters Point. If you are a lawyer or consultant devoted to environmental justice, should you help a group of community members who ask you to help them bring the power plant to Hunters Point? Why or why not?

8. Assume that you are a staff scientist with the California Energy Commission, and your analysis of potential emissions from the proposed SFEC power plant convinces you that, based on everything currently known, the addition of a power plant would not violate any existing environmental standard. You are not a health expert and have not done an independent survey of the literature evaluating the health effects of various pollution levels. You are asked by your superiors at the Commission to hold an official Aworkshop@ meeting in the Bayview-Hunters Point Community to discuss air pollution from the power plant.

If you are asked at the Aworkshop@ by a member of the community whether the power plant is safe, what would you say? Would you discuss the problems of predicting and modeling air pollution? Would you discuss the limited protections afforded by the governmental standards? Do you believe that you have an ethical obligation to voluntarily discuss the problems and limits? What if you believe that a discussion of the problems or limits would more likely confuse everyone than help clarify your findings? What if your superiors at the Commission tell you not to volunteer the information unless you are specifically asked? Would your decision on these questions depend on whether this is an environmental justice problem or not?

9. Assume that you are an independent scientist, engineer, or lawyer concerned about environmental justice issues and that a local community group invites you to a meeting called to help organize opposition to the proposed power plant. What should your role be? How would the role change depending on your profession (e.g., lawyer versus engineer)? If community members express a belief that the siting of the power plant would pose a health hazard and you do not believe that to be true, should you express your opinion at the meeting? Should you try to convince the community members that they are wrong? If the community

group decides that raising the health hazard issue would draw more community members into the opposition efforts, would you help the community group advocate this position even if you personally do not believe in the position? If the community group decides that raising the health hazard issue would delay the siting process and thus exert pressure on the developers of the SFEC project to withdraw the project or negotiate with the community, would you help the community group develop materials to support their position on the health hazard issue even if you disagree with it?

10. In hindsight, given the California Energy Commission's findings, should the community have focused so much of its efforts on working with their attorneys and presenting their position before the CEC? Were the community's efforts wasted? Why do you think that the community chose to present evidence of the harmful effects of particulate emission from the power plant? Do you think that this was a major concern for the community, or did the community raise the issue because it was strategically the best position for the community to take? Given the Commission's findings, what additional evidence would the community have needed to present to convince the Commission that there was a significant health concern?

11. As noted earlier, the San Francisco Department of Health has conducted two investigations of the health of the residents of Bayview-Hunters Point at the urging of the community. What should the federal government, the state, and/or the City of San Francisco do in light of the findings of the Department of Public Health? How should the findings affect siting decisions? Do you think that money and other resources should be spent trying to connect the adverse health effects in the community with particular sources of pollution? From the standpoint of the community, do you believe that there are better ways of spending any available money or other resources?