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Focusing Events in Environmental Policy: Exide Technologies, Aliso Canyon, and Industrial Health Crises in Southern California

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Abbreviations

AQMD	Air Quality Management District
CalEPA	California Environmental Protection Agency
CalOES	California Office of Emergency Services
Cal/OSHA	California Occupational Safety and Health Administration (see DOSH)
CARB	California Air Resources Board
CEC	California Energy Commission
DOGGR	Department of Oil, Gas, and Geothermal Resources
DOSH	Department of Occupational Safety and Health (see Cal/OSHA)
DTSC	Department of Toxic Substances Control
EGP	Eastern Group Publications
FWW	Food and Water Watch
LAUSD	Los Angeles United School District
OEHHA	Office of Environmental Health Hazard Assessment
SCAQMD	Southern California Air Quality Management District
SPR	Save Porter Ranch

Abstract

Focusing events are sudden, rare events that become known to policymakers and the public simultaneously, highlighting issues with existing public policy. Two case studies, the gas leak from the Aliso Canyon natural gas storage facility near Porter Ranch, and the publication of the Health Risk Assessment and discovery of lead contamination from Exide Technologies' battery recycling facility in Vernon, are used to deepen theoretical insights into the development and functionality of industrial health crises as focusing events. The case studies suggest four key areas relevant to understanding focusing events. The first is the unique characteristics of industrial health crises, which often involve anthropogenic risks and a degree of contestation unusual in other focusing event literature. The second is the scale of analysis, balancing geospatial realities with local histories, broad social dynamics and power structures, and the multiscalar nature of policy change. Third, community activism plays multiple vital roles in pushing a potential focusing event towards lasting policy change. Finally, the incorporation of ideas from environmental justice into the focusing event framework results in a better understanding of power and privilege in the creation of, and response to, industrial health crises. All four aspects have been written about in other bodies of literature, but have not yet been brought to bear on the concept of focusing events. These four domains thus add nuance to the scholarly understanding of one aspect of the policy change process, and provide a starting point for further research into the processes governing our public policy systems.

Introduction

On October 23, 2015, the Southern California Gas Company realized something was wrong. One of the wells in its Aliso Canyon natural gas storage facility in Los Angeles – Well SS-25 – had begun leaking. The exact cause was unclear, but now a mix of methane, mercaptans, and other chemicals was flowing out of the ground at an alarming rate and dispersing into the atmosphere above one of the largest metropolitan areas in the world. Soon, numerous local, state, and federal agencies got involved, lawyers moved in, and ten weeks later, a state of emergency was declared by Governor Jerry Brown. SoCalGas relocated residents and policymakers promised action. By February, the leak was capped, but debates over the appropriate long-term response, estimates of impacts on public health and greenhouse gas emissions, and Aliso Canyon's role in local energy security continued.

Just across town and only months before, in March 2015, the Exide Technologies battery recycling plant had finally been shuttered. Although there had been complaints, concerns, and fines for decades, the shutdown was put in motion by a 2013 report revealing that nearby residents and workers faced an increased risk of cancer from arsenic emissions from the facility. It took almost two years to close the facility, and as of late 2016, neighboring communities have not received adequate funding to test for or remediate hazardous compounds including lead and arsenic that the facility emitted over its long tenure.

This disparity was succinctly and dramatically summed up by the opening paragraphs of an article entitled "Exide, Porter Ranch: A Double Standard," written by Nancy Martinez (2016) for a consortium of local papers in eastern Los Angeles:

> The complaints of headaches, bloody noses and asthma by Porter Ranch residents sound all to [*sic*] familiar to eastside activists who've spent years fighting their own large scale local environmental health hazard.
>
> So are the demands for government officials to immediately shut down Southern California Gas Co.'s natural gas storage facilities near Porter Ranch that residents blame for their health crisis.
>
> Strikingly different, however, has been the response from state regulators and elected officials – including Gov. Jerry Brown –who for years failed to take the same level of bold action to stop Vernon-based Exide Technologies from putting the lives of thousands of east and southeast working class, predominately Latino residents at risk.
>
> Money, race and political power are at the root of the inequity, activists claim.

Two weeks later, the idea was picked up by the *Los Angeles (LA) Times* editorial staff: "Why does affluent Porter Ranch get more urgent environmental relief than working-class Boyle Heights?" (LA Times Editorial Staff, 2016a), broaching the comparison to a much wider audience. The *LA Times* headline raises two interesting points. First, these two communities have significantly different histories and demographics, and the very existence of, let alone response to, their respective industrial health crises[1] is cause for interrogation. Second, the use of the term "relief" brings up the question of the appropriate response to a crisis. There is usually an immediate, emergency response, the relief, but the longer-term implications can be much more opaque.

[1] There is significant scholarly discourse on the terms *crisis* and *disaster*. I follow Boin and 'T Hart's distinction (2007), also used by Birkland (1996). In a *crisis,* "a community of people perceives an urgent threat to core values or life-sustaining functions which must be dealt with under conditions of uncertainty" (pg. 42), i.e. a fork in the path. A disaster is an "episode that is collectively construed as very harmful" (pg. 42); i.e. the worse outcome occurred. In industrial and environmental health threats, negative impacts are often avoidable if action is taken promptly and wisely. Thus, in this work, I use the term "crisis" for the onset of the two events, and disaster to refer to the outcomes when relevant.

In his seminal work on the policymaking process, John Kingdon refers to such crises as focusing events that draw policymakers' attention to a policy failure which is then promoted on the policy agenda for review and, ideally, change (Kingdon, 1995). Subsequent work on focusing events has analyzed events that can be quantified by levels of death and destruction, such as hurricanes and earthquakes, terrorist attacks, nuclear accidents, and oil spills (Birkland, 1997, 2006; Bishop, 2014), and demonstrates via case studies that such focusing events can raise relevant issues on the governmental agenda, if not necessarily result in concrete changes in policy. However, the two case studies at hand raise a number of questions about industrial health crises as focusing events, and I argue that they illustrate four key omissions in the current model. These four factors – the uniqueness of industrial crises, the scale of issue and response, the role of community organizing, and a lack of focus on justice – influence the role industrial health crises play in policy change, and are a lesson in policy change after disasters of the industrial era.

The first factor is the uniqueness of industrial health crises, compared to other crises such as hurricanes and earthquakes.[2] This can be roughly divided into the complicated, anthropogenic nature of the risk, and the inherent contestation over causes, impacts, and appropriate responses that arise from such crises. For example, the risk might arise from extended, invisible emissions and might manifest as increased rates of cancer rather than immediate losses of life, with some notable exceptions such as Bhopal. Although in certain respects a comparison with nuclear power is relevant – both occur due to a technological or human failure, rather than an "act of God," and the hazard is typically invisible to the naked eye yet can have dramatic long-term impacts – there are other differences that influence such crises' role as focusing events.

[2] Birkland also discusses oil spills at length. However, in the vast majority of cases, these have no *direct* impact on human health but rather pose significant ecological and economic risks.

Second is the scale of response. The existing literature primarily focuses on federal policy and long-term policy change (Birkland, 1997; Sabatier, 1988; Smith, 2000), although many case studies skate around similar ideas using alternative framings (Pulido et al., 2016; Rich et al., 1995; Zavestoski et al., 2002). While federal policy is undoubtedly influential in environmental regulation and thus pollution risks, industrial health crises are nearly always local, and the scale of the response is commensurate. Activist groups responding to a health hazard from an industrial facility have the greatest leverage at the city or county level, particularly in a highly populous state like California, due simply to the crush of people and problems competing for attention. In this respect, the city of Los Angeles is a particularly good location to study, as its sheer size gives municipal and county structures and its heft at the state and federal levels much more weight than other areas of the US.

A third oversight in the policy process literature is the integral role of community organizing. Although prior research includes the public as a figure in policy decisions, it de-emphasizes the role of active protest and engagement in publicizing an issue, holding policymakers accountable, and making demands. Through organizing, affected communities are able to keep their health crises on the policy agenda and to set alternatives for policy change. Without the dedication and work of affected residents, many potential focusing events would fade away into the sea of other issues that bureaucrats and elected officials face.

The final factor is a lack of focus on justice: the influence of focusing events is dependent on which communities are affected and the resources they can leverage to push for change. Industrial health crises usually have highly localized impacts, affecting single communities, often low-income communities of color (Lerner, 2010). These communities are often the least able to take advantage of the opportunity for change presented by a potential focusing event.

Political, social, and economic marginalization affects their ability to act as a concerned public or gain sustained attention from political actors and the larger media. Although this is not an absolute truth for all industrial health crises, it is a substantial pattern ((Morello-Frosch & Lopez, 2006); Lerner, 2010). The two case studies in question provide a powerful illustration of some of these concepts, as one, Exide, occurred in just such a community, while the other, Aliso Canyon, occurred in much wealthier, whiter neighborhood. These facts do not change the suffering of either community, but rather provide a basis for analyzing the impact of these characteristics on policy responses within the same city.

I use the Aliso Canyon natural gas leak and the Exide Technologies lead contamination as case studies to explore these facets of industrial crises. Each of the four influences the ability of industrial health crises to act as focusing events, and therefore can deepen our understanding of the nature of focusing events and their role in public policy processes. The policies relevant to industrial health events are located in three broad policy domains: environmental regulation, public health, and their intersection, environmental justice (EJ). In this thesis, I will outline a brief history of the EJ movement and its influence on public policy and academic discourse and its lessons for policy analysis, with a particular focus on Southern California. Subsequently I will explore the literature on policy change and current air pollution policy in the Los Angeles area, a multilayered network of rules, agencies, and overlapping jurisdictions. In chapters 3 and 4, I explore the two case studies in more detail, drawing on literature about environmental justice, vulnerability, and crisis to understand the intertwined histories of these communities and their respective crises. In the final chapter, I pull together important aspects of the two case studies to explain these four factors in more depth and argue for their incorporation in the model of policy responses to focusing events.

The bulk of the research for this thesis draws on media reports, government documents and publications, and content provided by the companies themselves. Data were all freely and publicly available, with the exception of some news outlets (e.g. the *Los Angeles Times*) which require a subscription. As part of the purpose of this investigation is to determine the transparency and accessibility of information for affected communities, sources that do not fit this description, or that are only available via public records requests or pose other significant barriers to access were largely excluded. In addition, I conducted semi-structured interviews with key players in the policymaking process, who consented to speak with me within their professional capacity. There were no foreseeable harms for respondents, and all consented to have their names and commentary included in this research. Commentary given in public forums, whether included in newspaper articles, meeting minutes, or observed by the author, were also included.

Chapter 1.

A Brief History of Environmental Justice

Environmental justice (EJ) is the concept that all people have the right to clean environment in which to live, work, play, study, and worship, first suggested in 1990 by Robert Bullard in his seminal study of environmental injustice, *Dumping in Dixie* (Bullard, 1990). This definition has subsequently been adopted by the Environmental Protection Agency (EPA) and codified into American public policy. However, its roots were not in academia but rather in community organizing against unfair land use and toxics disposal.

National environmental justice movement

Although local organizing efforts against environmental injustices had occurred in other parts of the country, a watershed moment for the national EJ movement occurred in Warren County, North Carolina, in 1982. Illegal dumping along state highways had contaminated over 32,000 cubic yards of soil with polychlorinated biphenyls (PCBs), a highly toxic family of chemicals classified as probable carcinogens (WHO, 2003). The governor decided to dispose of the contaminated soil in the city of Alton, Warren County. Warren County was 64% Black and had a median income a third lower than the state average (Bullard, 2000).

Despite three years of legal battles, in September, 1982, the toxic soil dumping in a landfill in Alton began. Local residents and civil rights activists mobilized to disrupt dump truck deliveries, with in hundreds of arrests. They formed Warren County Citizens Concerned About PCBs, which garnered national news coverage. Their work gained support from environmental activists, civil rights and labor leaders, and black elected officials across the country, continuing for years as residents struggled to mitigate serious risks to local drinking water and their health and to hold the state and federal EPA accountable (McGurty, 2007). The mass organizing and high profile of Warren County galvanized national political will, spurring a 1983 report from the federal General Accounting Office on hazardous waste siting in the region. Unsurprisingly, it found strong correlations between race, socioeconomic status, and hazardous waste siting. In the following decades, extensive documentation of a similar national pattern, and actions against it at multiple scales by multiple stakeholders, continued to accrue (see a few examples in Table 1.1).

Table 1.1. Selected national EJ milestones. Adapted from Bullard et al. (2014).

Year	Event
1969	Cesar Chavez and United Farm Workers declare National Grape Boycott Day, and Ralph Abascal with CA Rural Legal Assistance files a suit ultimately resulting in a ban on DDT
1978	The Love Canal toxic contamination case in Niagara Falls, NY, breaks into national news
1979	*Bean v. Southwestern Waste Management:* First lawsuit charging environmental racism under Civil Rights Act, Houston, Texas.
1982	Warren County, North Carolina selected as site of PCB dump, sparking intense protests
1983	Federal General Accounting Office publishes report, *Siting of Hazardous Waste Landfills and Their Correlation With Racial and Economic Status of Surrounding Communities*
1987	United Church of Christ's Commission for Racial Justice publishes *Toxic Wastes and Race in the United States*
1990	Bryant and Mohai organize conference, Race and the Incidence of Environmental Hazards at the University of Michigan; Bullard publishes *Dumping in Dixie.*
1991	First National People of Color Environmental Leadership Summit, resulting in the Seventeen Principles of Environmental Justice
1992	President George HW Bush establishes the Federal Office on Environmental Equity in the EPA (now known as the Office of Environmental Justice)
1994	President Clinton issues Executive Order on EJ (12898)

This grassroots organizing was accompanied by a surge of scholarship on EJ as a theoretical frame that unites justice scholarship, social theory, and spatial histories (Bullard, 2000). Reflexive development of environmental justice concepts is ongoing, as such concepts are created simultaneously from the bottom-up and from the top down (Čapek, 1993). An analytical EJ framework assumes a specific environmental "bad," for example a hazardous waste dump,[3] is the result of local history and context and multiscalar social systems such as institutionalized racism and white privilege and educational and socioeconomic disparities between different groups (Brulle & Pellow, 2006; Pulido, 2000). For example, in many communities, residential redlining created segregated neighborhoods, and the inaccessibility of mortgages curtailed the ability of families of color and low-income families to build wealth through home ownership (Brulle & Pellow, 2006). These wider social patterns are localized to specific areas, and the unique characteristics and vulnerabilities of the community affect, and are affected by, the development of a particular "bad" or risk. Thus, understanding the specific and broader history of a community is crucial to understanding the advent of a particular environmental inequality.

There is debate about cause and effect of environmental injustice, as the construction of a potentially hazardous facility can depress housing prices, encouraging move-in of low-income residents, often of color, but recent research indicates that the pattern of inequality is more strongly influenced by unequal siting rather than by minority move-in (Pastor et al., 2001). Regardless of cause and effect, the outcome illustrates the complex interplay of historical and social factors in the creation of environmental injustice. At a more fundamental level, the idea that *siting* and *intentionality* define environmental racism is rooted in a narrow conception of what constitutes environmental racism (Pulido, 2000).

[3] This has also been extended to specific environmental "goods" like access to safe green spaces and work spaces. Here I focus on "bads" because the case studies are pollution and public health cases.

In EJ research, the role of race has become particularly important; even when controlled for income and other factors, people of color are disproportionately impacted by environmental hazards (Pastor et al., 2001). While other aspects of identity including socioeconomic status, gender, ability, and age play a significant role in the unequal distribution of environmental benefits and hazards, the role of race and socioeconomic status will be the focus here, explored in the context of Los Angeles in the following section.

Environmental justice in California and Los Angeles

Both scholars and activists have penned key works on environmental justice rooted in Southern California and the Los Angeles area in particular. As a city, Los Angeles has macro-level diversity, with high numbers of Latinx and Asian residents compared to the wider US, coupled with widespread residential segregation (Silver, 2015). It also has significant income inequality, with both a higher median income *and* a higher percent of people in poverty than the US as a whole, coupled with a long and extensive history of industrial production. For more demographic details, see Table 1.2. These factors intersect to create situations of environmental injustice across the city and region (Morello-Frosch & Lopez, 2006; Pulido, 2000).

Table 1.2. Demographics of Los Angeles County. US Census Bureau, 2010.

	Los Angeles County	**United States**
Total population	9,818,700	308,758,100
White alone, not Hispanic (%)	*27.8*	*63.7*
Black alone (%)	*8.7*	*12.6*
Asian alone (%)	*15.0*	*4.8*
American Indian and Alaska Native alone (%)	*0.7*	*0.9*
Native Hawaiian and Pacific Islander (%)	*0.3*	*0.2*
Hispanic/Latinx (%)	*47.7*	*16.3*
Two or more races (%)	*3.0*	*0.2*
Foreign-born (%)	34.9	13.1
Non-English language spoken at home (% of people above 5 years)	56.8	20.9
Median income ($)	55,870	53,482
Persons in poverty (%)	18.7	13.5

Case studies in LA have amply documented disproportionate exposure to various toxic facilities and sources of pollution between white communities and low-income communities of color (Boer, Pastor, Sadd, & Snyder, 1997; Pastor, Sadd, & Hipp, 2001; Sadd, Pastor, Boer, & Snyder, 1999). In her seminal piece on white privilege and environmental justice, Laura Pulido (2000) uses Los Angeles to argue that geographic studies of environmental racism must move beyond purely spatial analyses to incorporate more nuanced historical understandings of racism and white privilege in the context of spatial relations. She notes that in Los Angeles, as in many other cities, white residents "secured relatively cleaner environments by moving away from older industrial cores via suburbanization;" thus the "historical processes of suburbanization and decentralization…have contributed to contemporary patterns of environmental racism" (p. 12). It is within this particular context, and these larger frameworks, that our two case studies are situated. Pulido's framework in particular is crucial to understand the histories laid out in Chapters 3 and 4.

Incorporation of environmental justice into law and public policy

The EJ movement has had an effect beyond mitigating local EJ issues: it has successfully codified many of its tenets into federal and state laws. Two landmark moments came in the 1990s. The first was President George HW Bush's 1992 creation of the Federal Office on Environmental Equity (now known as the Office of Environmental Justice) in the EPA. The OEJ oversees the National EJ Advisory Council, the Federal Interagency Working Group on EJ, and EJ Small Grants. The second was President Clinton's 1994 Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which requires all federal agencies to consider environmental justice in decision-

making. Other federal agencies have incorporated these ideas into their work, including Housing and Urban Development in initiatives for lead abatement and brownfield redevelopment, and the Department of Transportation in its highway guidelines (McGurty, 2007).

The state of California has also demonstrated itself to be a relatively progressive. Two early attempts came from State Representative Lucille Roybal-Allard, who was raised in Boyle Heights and the daughter of the first nonwhite LA City Councilperson, Edward Roybal. She twice introduced a bill that would have required demographic information for any "potentially high-impact development projects" including hazardous and solid waste sites, although it was twice defeated in 1992 and 1994. Nonetheless, by 1999 California had succeeded in passing two related EJ laws. The first, SB 115, made the Governor's Office of Planning and Research the coordinating agency for environmental justice initiatives and "called on state agencies to address environmental health disparities within their government programs" (Petersen et al., 2006, p. 348). The second, SB 89, in the vein of President Bush's national EPA, required the California EPA (Cal/EPA) to create a Working Group on Environmental Justice and an Environmental Justice Advisory Council.

Part of the reason for this leadership in environmental justice is the changes in local and state leadership in California. Petersen et al. (2006) write, "the ascendancy of minority, mostly Latino, California legislators, many of whom had personal experience with affected communities and were committed to promoting environmental justice, … [provided] additional policy opportunities and support" (p. 349) As government institutions become more representative, they also better represent the experiences, values, and desires of their constituents, including perspectives on environmental justice. As we shall see, the role of local representatives (or *lack*

thereof, in particular in unincorporated areas of Los Angeles County) is hugely important, particularly in the case of Exide Technologies.

That is not to say that public policy and political representation are complete solutions for environmental injustice. As Pulido, Kohl, and Cotton (Pulido et al., 2016) argue, the many small steps towards a more inclusive, accountable policy arena that I outlined above have not, in general, led to a better environment for disadvantaged communities. In some cases EJ activism has stopped the development of new facilities or the expansion of existing ones, but macroscopic *improvements* have not come about through policy change. Nonetheless, public policy remains an important tool for advancing justice through the remediation of existing harms such as Exide and Aliso, and the prevention of new ones. The general processes of policy change within Southern California, and how crises such as Aliso and Exide fit into them, will be explored in more depth in the following chapter.

Chapter Two

Changing Public Policy: Theoretical Frames and Toxic Emissions Management in the LA Basin

The process of policy change is never easy. It often takes years, even decades, for the right confluence of people, events, and resources to push through a substantive reform. According to political scientist and public policy scholar John Kingdon, such change happens in roughly four stages: setting the policy agenda, specification of alternatives, a decision among these alternatives (e.g. an Executive Order or passage of a law), and finally implementation (1995). Although these four stages are somewhat discrete, the actual occurrence of policy change does not happen in neat, stepwise progression.

Rather, such processes are best described by Kingdon's adaptation of Cohen, March, and Olsen's (1972) "garbage can" model of organizational choice to policy change. Cohen et al. argue that choice opportunities are like garbage cans "into which various kinds of problems and solutions are dumped by participants as they are generated" (p. 2). A number of factors influence the system, including what kind of garbage goes into the can, what the can itself is like, how others perceive of the garbage, et cetera.

In his adaptation of the garbage can model, Kingdon (1995) describes three streams – problems, policies, and politics – which must coincide to open a window for policy change (see

Figure 2.1). The politics stream involves the political "mood" and individual people that influence broader policy systems and operate independently of particular issues. The policies stream involves developing policy options and alternatives that can be used to solve problems. This is not always in response to a problem; rather, bureaucrats, academics, think tanks, and other policy generators develop pet ideas which they support and "hook on" to issues as they arise, regardless of whether they were intended to address that particular issue or not. Finally, the problem stream involves identifying and drawing attention to an issue, policy gap, or policy failure that can be addressed via a change in policy. Although this step may seem the most straightforward, in fact there is significant literature on the vagaries of problem definition.

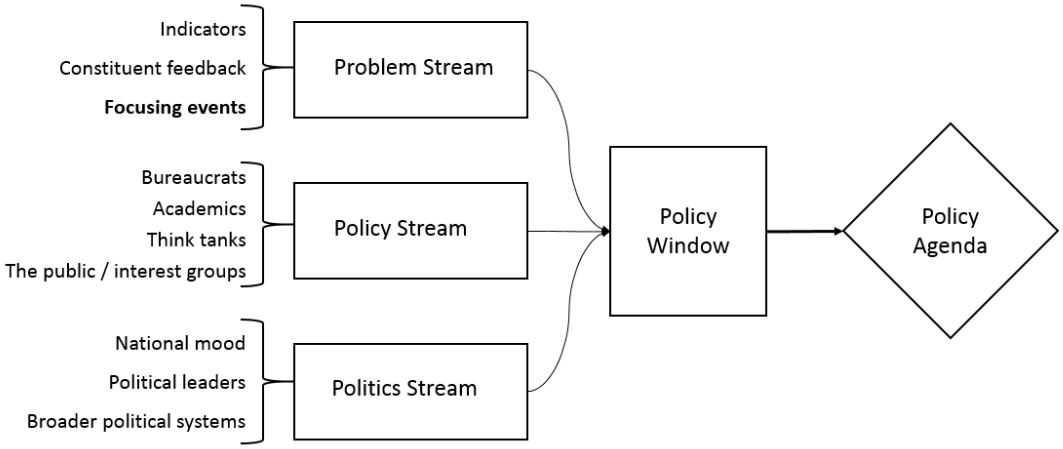


Figure 2.1. Kingdon's garbage can model of policy change.

Problem definition

> *Hazards are produced by business operations, to be sure, but they are defined and evaluated socially— in the mass media, in the experts' debate, in the jungle of interpretations and jurisdictions, in courts or with strategic intellectual dodges, in a milieu and in contexts...*
>
> Ulrich Beck (Beck, 1992a)
>
> Also quoted in *Contested Illnesses,* by Brown et al. (2012, p. 1)

Social scientists have long rejected the idea that "social problems are objective and identifiable societal conditions that have intrinsically harmful effects" (Hilgartner & Bosk, 1988,

p. 53). Rather, they are socially defined and often passionately contested. According to Hilgartner and Bosk, their identification and definition depend on six main elements, a few of which are particularly relevant to the idea of industrial health crises (1988).

The first is competition between problems for limited societal attention. This may be between different views of the same issue (e.g. there is objective data indicating emissions of a chemical, but two groups disagree on whether it is dangerous or not) or between different issues (e.g. toxic chemicals versus greenhouse gas emissions). In many cases, the public and public agencies simply lack the resources to address all possible environmental health risks. At the local level, fewer total resources are available, but there is less competition for them.

A second is that each stakeholder in the policy community has their own carrying capacity. For example, public agencies are often short-staffed and underfunded, and cannot inspect or adequately monitor all of the facilities which they are charged with regulating. Therefore, they are often forced to prioritize issues and set aside other potential but less pressing problems. In contrast, local communities may only be dealing with *one* facility, but may lack the time, money, political power, language or technical knowledge to recognize, advertise, or protest a problem, and even more so, a potential larger set of problems emanating from multiple sites.

Third, while attempting to draw attention to a particular issue to establish it as a wider societal problem, institutional, political, and cultural factors are important. Some of these factors are determined by the institutional ecology[4] of different problem and policy arenas, including priority and funding structures, and other connections between private and public organizations and the communities to which they are tied. Another component is the specific characteristics of

[4] Institutional ecology is a term that attempts to acknowledge institutions as a network through which objects and concepts flow, encompassing the entirety of the institution, the ways in which institutions choose and respond to their environments, and the multiple viewpoints from which an institution can be considered (Star & Griesemer, 1989).

a situation that can help or hinder its perception as a problem, including its "drama" or shock factor, its novelty, and its adherence to cultural preoccupations and political biases. For example, the same facility or pollution in two different neighborhoods may be perceived very differently: The Cerrell report (Powell, 1984), which infamously pointed out the qualities of communities that made them easier targets as hosts for locally unwanted land uses (LULUs), noted that older, working-class, more conservative and more Catholic neighborhoods were less likely to protest a new facility. Although the report has been taken as potent evidence of the use of demographic data as the primary criterion for hazardous facility siting (Gibbs, 2002), it also illustrates the differences in community responses to an industrial facility.

Perhaps most important in the definition of a problem is access to information. The two cases in question, and industrial health crises in general, also call to attention Ulrich Beck's (1992b) comments on knowledge-related vulnerability. In *Risk Society*, Beck outlines his seminal theory that modernity defines and is defined by a host of new "manufactured" risks – pollution, new illnesses, new crimes, nuclear weapons – that are primarily controlled by human agency, rather than forces of nature. He writes:

> First, such physical risks are always created and effected in social systems, for example by organizations and institutions which are supposed to manage and control the risky activity. Second, the magnitude of the physical risks is therefore a direct function of the quality of social relations and processes. Third, the primary risk, even for the most technically intensive activities (indeed perhaps most especially for them), is therefore that of social dependency upon institutions and actors who may well be – and arguably are increasingly – alien, obscure and inaccessible to most people affected by the risks in question (p. 4).

So-called gatekeeping of private and public documents is the process by which people, institutions, and processes restrict the general public's ability to identify, demonstrate, and support claims of a problem or environmental injustice. Often pollution is not overtly detectable, making it difficult for communities to know when a potentially harmful compound like lead or

arsenic is being emitted. In some cases, smells, particulates, or physical symptoms act as cues to the risks, and in rare cases, agencies or companies publish reports that a determined member of the public or press can find. Particularly when it comes to technical issues such as identifying chemicals and assessing the associated risks, communities are at a disadvantage for understanding the issues they are facing, even if there is information available. This is compounded in communities with lower educational attainment. Finally, once a problem is identified and documented, selectivity of media coverage can considerably affect perception of the wider public and energy for collective action. Not just *accessing* information but *sharing* it is an unequal process, and thus what is seen a problem is always relative to who it affects and how much power they hold.

These characteristics of problem definition will be explored in the context of each case study, but it is within this frame of contested knowledge and unequal power relations that the role of potential focusing events in the policy process must be understood. Indeed, there are two main types of crises: *consensus* and *dissensus* crises (Quarantelli & Dynes, 1977). In consensus crises, there is general agreement on the existence of a crisis and general directions for the response. Huge, weather-related events often fall into this category. In dissensus crises, there is dispute over whether the crisis actually exists, and if so, what exactly and how significant it is. Industrial health crises often fall into this latter category, for the informational reasons outlined above, as well as for the inherently difficult nature of applied population epidemiology. Professional epidemiologists often disagree with "popular epidemiology" that identifies an environmental disease based on experience and shared narrative (Brown, 1992; Brown et al., 2012), and if there is no formalized evidence of health impacts, then there is often little action

and no liability. The contestation over the very *existence* of an industrial health problem is key to understanding its power as a focusing event.

Kingdon originally introduced the concept of focusing events in 1994, and it has been further defined by Birkland as an event which is a "rare, harmful, sudden event that becomes known to the mass public and policy elites virtually simultaneously" (1997, p. 2). Birkland gives examples including natural disasters such as hurricanes and earthquakes, terrorist attacks, oil spills, and nuclear accidents, all best characterized as consensus crises, but anything that meets the criteria is a potential focusing events. The *potential* focusing event is important – not all result in substantive reform, and the questions of which events do or do not catalyze change and in what ways is a primary focus of this thesis.

Agenda setting

After a problem is collectively identified, policy entrepreneurs – anyone willing to invest their resources, whether they are formally part of the government or not – must be convinced of its status and push for its inclusion on the governmental agenda (Kingdon, 1995). Kingdon suggests that focusing events alone are often not enough to guarantee inclusion, unless coupled with a preexisting perception of a problem, a combination with other similar events, or changes in additional indicators like housing prices. While Kingdon notes that constituent feedback is an important general mechanism for agenda inclusion, neither he nor Birkland explore in depth the role that community activism plays in the wake of focusing events. I will argue that community activism is not only a fourth co-factor that strengthens focusing events, but that it goes one step further, to introduce policy alternatives and push policy makers to take action, especially in localized industrial health crises.

Birkland (1997) notes three key factors that influence the success of focusing events in changing the policy agenda. The first is the degree of organization of a policy community. He writes, "event-driven policy [e.g. immediate disaster relief] is not the same as policy making in which events are used to advance group positions on how to improve existing policy [i.e. using an earthquake to push for stricter building codes]" (p. 37). Better organized groups are better able to take advantage of the leverage from a focusing event to push for the substantive changes they desire.

But communities also organize in *response* to focusing events. The second factor Kingdon discusses relates to this idea: the extent of public participation. There is usually already a policy community in place, often some variation of the *iron triangle* in which agency bureaucrats, special interest groups, and congressional committees form the three corners of a triangle of strong reciprocal relationships that can inhibit positive policy change and/or outsider involvement (Kingdon, 1995). Focusing events open the triangle, as all three corners are subjected to increased public scrutiny and new interest groups enter the scene.

The final factor is the extent to which the issue at hand is a tangible, obvious harm. When residents have overt symptoms or can smell the pollutant, it is easier to compel a response, if only because most people who visit the location can immediately detect the problem and sympathize with the victims. Images of damage and destruction can become powerful symbols to unite support for change (Birkland, 1997); think of the classic images that arose in the wake of September 11 or Hurricanes Katrina and Sandy. The acquisition of an infrared camera that could detect the methane plume from the Aliso Canyon leak provided a powerful visual of the problem. In southeast LA, near Vernon, smells abound, but they are not from Exide, and despite a few individual events such as falling ash in 2007, for the most part the lead and arsenic attributed to

Exide were invisible and ignored (see Chapter 3). The better an issue can be visualized by the masses as harmful, the more likely policymakers are to care.

Successful policy change

For an issue that has successfully gotten onto the agenda, the ultimate question is whether reformers will be able to take advantage of that policy window to push through policy changes. Bennett and Howlett (1992) synthesized the existing research on policy learning and resulting change (see Figure 2.2). They argue that there are three types of learning: governmental, lesson-drawing, and social. In governmental learning, state officials analyze the small scale of actions, rules, and processes that support a policy and make organizational changes to improve the efficiency or effectiveness of an existing policy. In lesson-drawing, agencies may copy, adapt, or draw inspiration for new ways to implement a policy objective from their policy network, resulting in changes in the instruments used to fulfill underlying purposes. Finally, in social learning, new ideas or perspectives are shared, and fundamental paradigms of a policy or policy domain shift to reflect new values (Bennett & Howlett, 1992). All of these processes – problem definition, agenda setting, policy change – will come into play in the case studies, but before exploring them in greater depth, it is necessary to get a better idea of the existing laws and policy framework regarding air pollution and toxic emissions.

LEARNING TYPE	WHO LEARNS	LEARNS WHAT	TO WHAT EFFECT
Government Learning	State Officials	Process-Related	Organizational Change
Lesson-Drawing	Policy Networks	Instruments	Program Change
Social Learning	Policy Communities	Ideas	Paradigm Shift

Figure 2.2. Typology of policy learning and change, from Bennett & Howlett (1992).

Air pollution policy in Southern California

The environmental policy landscape in California is complex. The very basis of environmental regulation – balancing public health, technical limitations, economic priorities, and legal concerns – requires the input of many stakeholders and tremendous finesse. California's complicated system is born out of a long and progressive history, and has achieved great successes in the past, including curbing the infamous LA smog. Nonetheless, it remains a tangled and sometimes confusing web of agencies, regulations, funding and enforcement challenges, public and private interests, and politics. In particular, this is influenced by a historical pattern of issue-specific institutions (such as the Air Resources Board) as well as a strong tradition of local power (CalEPA, 2001). In this section, I focus on the regulations regarding stationary sources of pollution, which is the domain of both case studies, drawing on public timelines from the California Air Resources Board (CARB, 2016b) and South Coast Air Quality Management District (SCAQMD, 1997).

The 1940s saw the advent of the smog epidemic in the City of Los Angeles, an event that shocked the nation and catalyzed the slow formation of a number of laws and agencies to improve air quality in California. The 1947 Air Pollution Control Act created local Air Pollution Control Districts. In 1976, the districts in most of Orange, Riverside, San Bernardino, and Los Angeles Counties were merged to form the South Coast Air Quality Management District (SCAQMD), a key agency responsible for the regulation of stationary air pollution sources such as manufacturing facilities and power plants.

As early as 1959, California paved the way for air quality regulation when it enacted legislation requiring the California Department of Public Health to "establish air quality standards and necessary controls for motor vehicle emissions" (CARB, 2016b). It established

rules for total suspended particulates, photochemical oxidants, sulfur dioxide, nitrogen dioxide, and carbon monoxide. In 1968, California created its first Air Resources Board, CARB, which took over rule-making from the Department of Public Health. There were still no comprehensive national standards.

Two years later, the federal EPA (EPA) was created, NEPA[5] was passed, and an amendment to the existing Air Pollution Control Act (1955) created the Federal Clean Air Act (FCAA of 1970) and expanded the federal mandate to include emissions limitations on stationary and mobile sources. Given California's unique air quality issues and its existing, exemplary system, the state was exempted from some FCAA requirements. The law even allowed other states to follow California's regulations rather than those of the federal EPA.

In 1980, the California Clean Air Act (CCAA) was passed (amended in 1988), establishing a twenty-year framework for air quality management in California. It served as the basis for much of what Congress enacted in the federal Clean Air Act Amendments of 1990, which included rules on acid rain, ozone depletion, and toxic air pollution. Currently, the FCAA requires the federal EPA to (McCarthy et al., 2011):

1. Set health-based standards for ambient air quality (National Ambient Air Quality Standards, or NAAQS) for "criteria pollutants."
    a. Criteria pollutants include: ground-level ozone, particulate matter, carbon monoxide, lead, sulfur dioxide, and nitrogen dioxide.
    b. State and local governments have attainment goals and deadlines, which can be met and maintained via their own regulations and permitting process, outlined in the State Implementation Plan (SIP).
    c. Nonattainment incurs penalties such as restrictions on federal funding.
2. Establish national emission standards for large sources of air pollution, such as:

[5] The National Environmental Policy Act (NEPA) requires any project, agency, or other entity working for the federal government to complete an Environmental Impact Report (EIR) and provide for public input to EIR and the decision-making process.

    a. motor vehicles
    b. power plants and some industrial sources, which are subject to New Source Performance Standards (NSPS) with best adequately demonstrated control technology

3. Mandate emission controls for sources of 187 hazardous air pollutants (HAPs), including benzene, arsenic, and 1,3-butadiene.

    a. Control levels dictated by MACT (Maximum Achievable Control Technology), updated periodically by the EPA
    b. Stationary area sources with high emissions of 30 specific have "generally available" control technology rules, which are less stringent than MACT
    c. Facilities handling these air toxics are required to produce risk management plans and the prevention of crises is handled by the Chemical Safety and Hazards Investigation Board

This list only contains the provisions of the FCAA that are relevant to the cases at hand. California's unique status resides in the first part of the law, as it is allowed to set its own air quality goals (California Ambient Air Quality Standards, CAAQS), which are in some cases more stringent than federal NAAQS, and which cover additional pollutants not regulated by NAAQS.

In general, state and local agencies take the frontlines on implementation and enforcement, and the federal government acts as a backstop in cases where additional enforcement power or funding is needed. CARB sets mobile source (motor vehicle) standards, compiles the statewide SIP, and oversees local districts. SCAQMD compiles the portion of the SIP for their district and controls stationary sources such as power plants and manufacturing facilities. Additionally, in California, facilities releasing hazardous pollutants are also required to conduct Health Risk Assessments (HRAs) describing the health impacts to nearby communities with a notification requirement if the risks exceed certain standards (Air Toxic Hot Spots Act, AB 2588, 1987). HRAs are overseen by SCAQMD. It was Exide's 2013 HRA report that sparked the crisis over its facility in Vernon.

California has continued to pursue improved air quality. In 2001, CARB adopted Environmental Justice Policies to ensure that low-income and minority communities are equally considered under ARB regulations and programs. The state also piloted programs like Community Health Air Pollution Information System (CHAPIS, 2004), a free internet map of various air pollution sources in CA, including an itemized list of each source's emissions. In 2006, the state passed the landmark AB 32, the California Global Warming Solutions Act, which established a unique state-level cap-and-trade program for greenhouse gases (GHGs). CARB was put in charge of monitoring and reducing GHG emissions such as methane, carbon dioxide, and nitrous oxides. CARB's jurisdiction over GHGs is part of the reason they were heavily involved in the Aliso Canyon leak, despite its status as a stationary source.

In 2012, the related SB 535 was passed, which required that at least a quarter of the cap-and-trade auction proceeds must go to projects that benefit disadvantaged communities, and at least a tenth of the projects must be located in these communities. The Office of Environmental Health Hazards Assessment (OEHHA) identifies "disadvantaged" communities through CalEnviroScreen,[6] a tool that identifies census tracts that are disproportionately vulnerable to and burdened by multiple sources of pollution. Projects range considerably in scope and content, from improving transportation infrastructure or building public-transit friendly affordable housing, and are selected by local agencies. Thus far, cap and trade proceeds have not met expectations, so the impact has been curtailed.

[6] The first version (CalEnviroScreen 1.0) was released in 2013, and the draft third edition (CalEnviroScreen 3.0) is public as of November 2016: http://oehha.ca.gov/calenviroscreen/general-info/calenviroscreen-30-draft-indicator-and-results-maps

Table 2.1. Selected federal and state air regulation milestones

Year	Event
1945	City of Los Angeles establishes Bureau of Smoke Control
1955	The federal Air Pollution Control Act is passed, funding research into air pollution.
1959	California enacts legislation requiring the California Department of Public Health to "establish air quality standards and necessary controls for motor vehicle emissions" (CARB, n.d.). Rules are established for total suspended particulates, photochemical oxidants, sulfur dioxide, nitrogen dioxide, and carbon monoxide.
1963	The first Federal Clean Air Act (FCAA) is passed, authorizing research into air quality monitoring and control techniques, but not establishing national rules for air quality
1968	California creates its first Air Resources Board (CARB), which took over rule-making from the Department of Public Health.
1970	The federal EPA is created. National Environmental Policy Act (NEPA) is passed. An amendment to the FCCA expands the federal mandate to include emissions control for stationary and mobile sources
1976	The districts in most of Orange, Riverside, San Bernardino, and Los Angeles Counties merge to form the South Coast Air Quality Management District (SCAQMD).
1980	California passes the CA Clean Air Act (CCAA), amended in 1988, which establishes a twenty-year framework for air quality management within the state. This is the basis for the FCAA amendments of 1990
1990	Another round of amendments to the FCAA tackle acid rain, ozone depletion, and toxic air pollution, establish a national permitting program for stationary pollution sources, and increase enforcement authority.
2001	CARB adopts EJ policies to ensure equal consideration under ARB regulations, programs.
2006	AB 32, the California Global Warming Solutions Act, establishes state-level cap-and-trade for greenhouse gases.
2012	SB 535 requires certain proportions of cap-and-trade proceeds go to projects benefitting environmentally disadvantaged communities, identified with CalEnviroScreen.
2016	SB 1000 requires city and county planning bodies to incorporate EJ into land use decisions

California also makes an effort to better understand the implications of air pollution. For example, in 2000 CARB started a Children's Environmental Health Protection Program, in which six communities were chosen for a longitudinal study on the impact of air pollution on children's health and development. Perhaps ironically, one of the communities chosen was Boyle Heights, in the 70-100 percentile in CalEnviroScreen, directly north of Vernon, and deeply affected by Exide's facility.

Finally, just a few months prior to this writing, California passed SB 1000, which requires cities and counties to take environmental justice under consideration in their land use decisions. The implications have yet to be seen, but hopefully will begin to redistribute environmental harms more equitably, if not eliminate them altogether.

In short, California has pioneered advances in vehicle emission controls, air toxics, and control of stationary sources before federal efforts in these areas were cemented in law. The short timeline given (Table 2.1) barely skims the surface of this history, and in fact there are other agencies and regulatory bodies indirectly linked to the cases at hand that have been left out, such as the California Air Pollution Control Officers Association (CAPCOA), a non-profit association formed in 1976 that consists of representatives from all 35 local air quality agencies throughout California. Each agency has numerous domains it oversees, and all work together to greater or lesser degrees, as is reflected in Table 2.2 (following page).

All of these agencies are *targets* for policy change, as well as agents that can enact changes. Given that many of them have the ability to set regulations, allocate funding, ensure enforcement, et cetera, they can assert considerable power over the issues at hand. It also raises the distinction between the policy itself and its implementation. Most agencies are involved in both processes, providing consultation, advocacy, and information to lawmakers while also setting many of the nitty-gritty details of public policy. Government institutions are the frontline responders. While they are often far from perfect, these agencies are crucial to understanding the outcomes of industrial health crises.

Table 2.2. Agencies involved in Aliso Canyon and Exide Technologies crises

Entity	Scope	Parent Agency, Jurisdiction, and Responsibilities
CalEPA	CA State Agency	*California Department of Environmental Protection* Contains six main sub-agencies responsible for implementing and enforcing environmental law: California Air Resources Board (CARB); Department of Pesticide Regulation; Department of Resources Recycling and Recovery (CalRecycle); Department of Toxic Substances Control (DTSC); Office of Environmental Health Hazard Assessment (OEHHA); and State Water Resources Control Board.
CalOES	CA State Agency	*California Governor's Office of Emergency Services.* Coordinates information sharing and action among governmental agencies in emergency situations, as well as proactively addressing homeland security, criminal justice, victim services, and public safety communications.
Cal/OSHA or DOSH	CA State Agency	*Division of Occupational Safety and Health (part of CA Department of Industrial Relations).* Protects public health and safety through research and regulation related to workplace hazards, including facility air quality and exposure to air contaminants
CARB	CA State Agency	*California Air Resources Board (part of CA Environmental Protection Agency (Cal/EPA)).* Responsible for regulating air quality throughout California, specifically mobile sources of pollution (e.g. vehicles).
CEC	CA State Agency	*California Energy Commission (part of CA Natural Resources Agency).* Responsible for forecasting and planning for future energy needs and maintaining the California Energy Code, in coordination with the CPUC.
City of Vernon	Local Gov't	*Government of City of Vernon.* Manages municipal services including Police Department and Fire Department, highly unusual for a city so small.
City of Los Angeles	Local Gov't	*Government of City of Los Angeles.* Manages municipal services including LA Police Department and Fire Department. Headed by Mayor Eric Garcetti.
County of Los Angeles	Local Gov't	*Government of County of Los Angeles.* Responsible for county services including elections, voter registration, law enforcement, jails, property records, public health, health care, and some social services. The County Board of Supervisors serves as the local government for all unincorporated areas.
CPUC	CA State Agency	*California Public Utilities Commission.* Regulates privately owned utilities in the state of California, including electric power and natural gas.

Continued next page

Table 2.2. *Continued from previous page*

Entity	Scope	Parent Agency, Jurisdiction, and Responsibilities
DOGGR	CA State Agency	*Department of Oil, Gas, and Geothermal Resources (part of Department of Conservation, California Natural Resources Agency).* In charge of monitoring oil and gas extraction and storage facilities in order to enforce state regulations. Carries out inspections and manages mandatory reporting from oil and gas operators.
DTSC	CA State Agency	*Department of Toxic Substances Control part of California Environmental Protection Agency (Cal/EPA)).* Produces and enforces regulations relating to the generation, handling, treatment, and disposal of hazardous waste in CA, and is involved in cleanup of contaminated sites. Works closely with federal laws and EPA.
LAUSD	Local Gov't	*Los Angeles Unified School District (part of the City of Los Angeles).* Operates and creates policy for public schools in the City of Los Angeles, including decisions about fitness of facilities for students' health.
OEHHA	CA State Agency	*Office of Environmental Health Hazard Assessment (part of CA Environmental Protection Agency (Cal/EPA)).* Evaluates health risks from environmental chemical contaminants, and has a technical and advisory role in regulatory decision-making.
SCAQMD	Southern California Agency	*South Coast Air Quality Management District*. Responsible for regulating air quality and stationary pollution sources (e.g. factories, refineries) in the South Coast District, which includes Orange County and non-desert regions of Los Angeles, San Bernardino, and Riverside Counties.

Chapter Three

Exide Technologies

> *"I think we are looking at one of the largest public health disasters in the state's history."*
> Gladys Limon, lawyer with Communities for a Better Environment
> Quoted by Southern California Public Radio (Peterson, 2015).

To stand in Vernon, California is to be assaulted by the smell. Odors from rendering plants and hundreds of other industrial facilities swirl in the air, nauseating and inescapable, floating through the streets that once were home to Exide Technologies' lead battery recycling plant. The facility was shut down in March 2013, more than two years after a mandated Health Risk Assessment (HRA) report indicated increased risk of cancer from arsenic emissions to 110,000 residents living in the surrounding area (see Figure 3.1). The revelation put the neighboring communities and policy makers in crisis mode and catalyzed a long, painfully slow response from public policy-makers as revelation after revelation about the permitting status, operating practices, and emissions at the Vernon facility came to light.

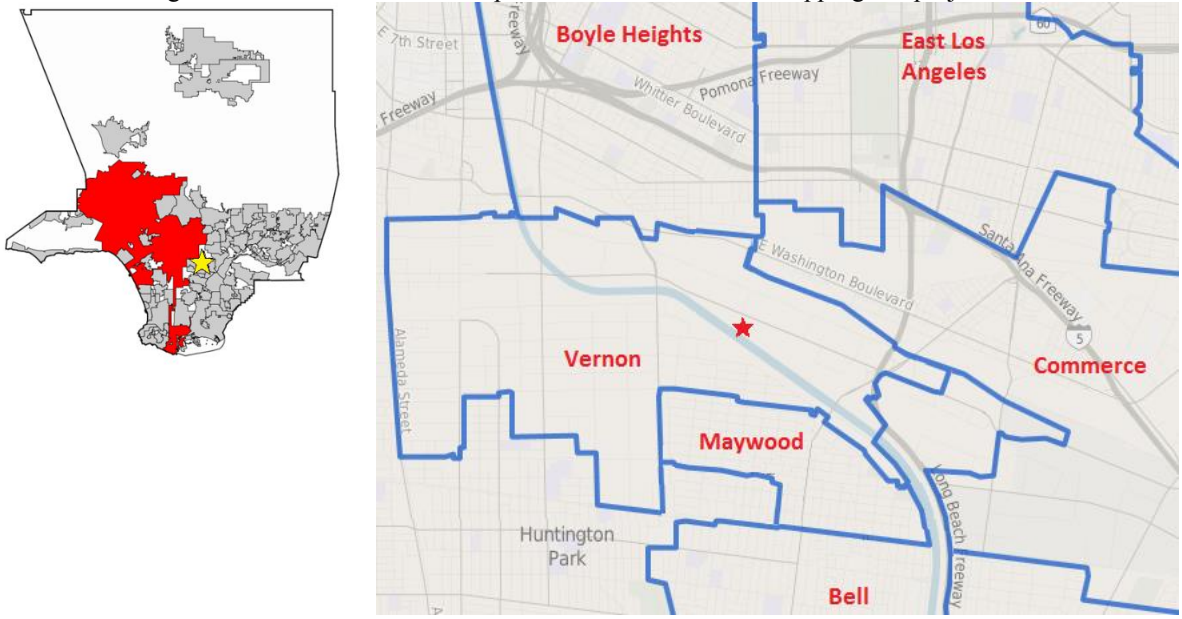
Local communities had a long history of activism and organizing, and public pressure forced regulators to suspend operations at the plant. Soon after, Exide filed for bankruptcy for the second time since 2000, when it purchased the Vernon facility. Finally, a 2015 legal agreement permanently shuttered the plant but released Exide from criminal liability (Barboza & Vives, 2015). Vernon and the communities near Exide followed a long and crooked path to crisis. The

details of this case tell a story of residents at risk in economically, socially, and politically marginalized communities, with harmful outcomes for everyone involved.

A local history

The City of Vernon is a fascinating enclave. With a population of just 112, it exists specifically as a haven for industry, an early environmental sacrifice zone for economic gain (Lerner, 2010). It was founded in 1905 as an "exclusively industrial" city along a side railroad line running to and from downtown Los Angeles, just five miles away. Over the years, stockyards and meatpacking became key enterprises, slowly joined by a suite of other industries including steel and aluminum, manufacturing of boxes, paper, cans, and pharmaceuticals, and food processing. The construction of an independent power plant in the 1930s provided low-cost power, and along with low tax rates, has enticed new industrial development for over eighty years. Vernon currently supports more than 1,800 businesses and their approximately 50,000 employees, and a total regional economic impact estimated at $5 billion ("History of Vernon," undated; "About Vernon," undated). The Vernon Chamber of Commerce claims that as industry grew, "a strong unionized work force developed, leading to excellent middle class incomes for thousands of area families ("History of Vernon," undated). That is the postcard story of Vernon, but it is far from an accurate representation of the complexity of its history and the relationship between Vernon and surrounding communities (see Figure 3.1). Before delving into that relationship, it is necessary to explore the history of those neighboring communities.

Figure 3.1a (left). Los Angeles County. City of LA in red; other cities in gray; yellow star at Exide Technologies. Adapted from Wikimedia Commons. **3.1b (right). Vernon and surrounding neighborhoods.** Exide Technologies marked with red star. Adapted from the LA Times' Mapping LA project.



These communities, which include Maywood, Boyle Heights, East LA, Bell, and Commerce, have many hallmark characteristics of vulnerability (see Table 3.1). The vast majority of residents are Latinx, and average income, age, and educational attainment are all low. Many are immigrants, often with limited English language skills. The public schools are struggling, with only 10 of 58 schools achieving an Academic Performance Index (API)[7] score of at least an 8/10, and the majority scoring less than a four. These factors alone suggest that health outcomes may be worse in southeast LA compared to other areas in Los Angeles (Morello-Frosch, Zuk, Jerrett, Shamasunder, & Kyle, 2011; O'Neill et al., 2003). Although specific information is not available, given the 55,000 blue collar jobs in Vernon (Williams, 2011), many residents from surrounding communities are likely economically dependent on its employment opportunities, either directly with Exide or with a similar facility.

[7] API (Academic Performance Index) is a metric used by the State of California, under the 1999 Public Schools Accountability Act, which measures schools' academic performance and growth on a variety of parameters. All school statistics in this paper include a one-mile radius around the neighborhood/city in question, except Vernon, which has no schools. The last year of API scores is 2013.

Table 3.1. Demographics of Vernon and surrounding communities

		City of Vernon	Boyle Heights	City of Commerce	Maywood	Bell	City of Los Angeles†
Total Population*		94	92,756	12,583	28,083	36,667	3,790,000
Distribution, %	White	2.1	2.0	4.4	2.8	5.9	29
	Asian	0	2.4	1.1	0.2	1.2	11
	Black	0	0.9	0.4	0	0.8	10
	Latino/a	93	94	93	96	91	49
	Other	5.3	0.7	0.8	0.5	1.4	5
	Foreign born	9.6[1]	52[1]	39[1]	55[1]	53[1]	39
	Median age (yr)	21	25	27	23	24	35
Have less than a high school diploma, %		40.9	68.8	54.2	70.4	64.9	25.1
Have 4-year degrees, %		18.2	5.0	4.6	2.3	4.0	31.5
Median household income, $		81,279	33,235	46,245	41,203	40,566	49,682
Households earning less than $20,000, %		8.3	40.9	28.3	36.8	28.9	22.4‡

* In 2008, LA Department of City Planning estimates
† All data from 2010 census
‡ In poverty (usually more than $20,000)
[1] Predominantly from Mexico and some from El Salvador

Yet, it is also necessary to move beyond demographics to explore the creation of place. Part of the explanation of the Exide crisis, as is often the case in environmental injustices, lies in the history of the affected communities (Pulido, 2000). I look in particular at Boyle Heights, a neighborhood in Los Angeles city proper, and East LA, a misleadingly-named unincorporated area just to the east of Boyle Heights (Benitez, 2004; Reft, 2013). This is not to diminish the importance of the other communities in the area, but rather to follow where the most media coverage and in some cases the highest impacts have been found.

When the original settlements in the Los Angeles area changed hands after the Mexican-American war, it unleashed "a period of anti-Mexican sentiment that left the population impoverished and strangers in their own homeland" (Benitez, 2004). Mexican Americans were pushed out of the city and across the river to Boyle Heights and East Los Angeles, joined in the following decades by African Americans, European immigrants, Japanese, Chinese, and

Armenians, among others, as LA's growing industrial center attracted migrants, gradually creating multiracial and ethnic working-class communities (Reft, 2013). During the first half of the twentieth century, Jewish immigrants fleeing Europe and Mexicans fleeing the Revolution immigrated to the area for its inexpensive housing, employment opportunities, and relative social tolerance. After WWII, with the national reconsideration of who was "white" and changing housing segregation patterns (Reft, 2013), many Jewish families relocated out of East LA. At the same time, continued immigration from Mexico cemented eastern LA as the largest Hispanic community in the US. Although many residents remained laborers, the culture, commerce, and traditions of the area gave the community vibrancy, and a small home-owning middle class flourished (Benitez, 2004).

It is critical to note that Boyle Heights, unlike unincorporated East LA, had voting power within the City of Los Angeles. In 1949 its residents used it to propel Edward R. Roybal to the LA City Council as its first non-white and first Mexican American member. Both Boyle Heights and East LA were influenced by the postwar activism of the '60s and '70s and struggled against ongoing lags in "educational opportunity, employment, economic opportunity, political representation, and all the social trappings of fully recognized, empowered citizens" (Benitez, 2004). These issues and the tradition of community activism remain today, and are partially manifested in a number of environmental justice organizations such as East Yard Communities for Environmental Justice, Communities for a Better Environment, Mothers of East Los Angeles, Union de Vecinos, and others. But the impact of being unincorporated also remains: residents do not have any directly elected representatives below the county level, and given the sheer size of LA County, their needs and desires may be left aside. Furthermore, the current population in *all* of Southeast Los Angeles – Boyle Heights, East LA, Maywood, Bell, Huntington Park,

Commerce, Vernon – includes a large number of undocumented residents, who do not have the ability to vote, and may also be deterred from certain forms of protest and engagement because of their status.

How does this history intersect with that of Vernon, the industrial city on their southern borders? The foundation of Vernon was influenced by the low cost of the land, the railroad, and possibly by the availability of laborers living close by. Since then, the fact that Vernon is independently incorporated means it is largely able to set its own rules, with disastrous consequences for neighboring communities. The city government is what Evan Hessel, writing for *Forbes* (2007), called a "benign dictatorship." Two families, headed by Mayor Leonis Malburg (descended from one of Vernon's founders) and City Administrator Bruce Malkenhorst, have controlled the city for decades, and "[they] run a nice little business. As of 2005 Vernon had $164 million in cash and liquid assets" for just 112 residents, and city leadership purportedly receives generous compensation (Hessel, 2007). All housing in Vernon is owned by the city, so attempts at opposing Malburg or Malkenhorst have been shut down by kicking the new candidate out of their house and thus the city.

In 2006, LA County took action against a few of the individuals running the city, charging them with minor infractions including voting in Vernon but living elsewhere and receiving inappropriate reimbursements from the city (Becerra, 2006). In 2011, Rep. John Perez introduced a bill to dissolve Vernon's city charter. Senator Kevin de León, a co-author, shifted his position to support extensive reforms in order to protect the thousands of jobs in the city. The bill did not succeed (Williams, 2011). Neither effort re-established a functional democracy in Vernon, and with so much money flowing through the city, it is entirely possible that any successors would follow a similar pattern of corruption. This leaves surrounding residents with

little recourse as “Vernon [continues] to create spoils for a few and a toxic stench for everyone else” (Hessel, 2007). The question is not whether Vernon was sited close to communities of color or whether they subsequently moved in for low-cost housing and jobs (Pulido, 2000); as the narratives given above show, these histories are intertwined in complex ways.

The final thread of this story is the relationship between the communities of Southeast LA and the Department of Toxic Substances Control (DTSC), the regulatory agency responsible for monitoring non-airborne toxic contamination. A long history of failures to pursue violations, failure to collect appropriate fines, and inadequate collaboration with communities (Garrison, Christensen, & Poston, 2013) contributed to a serious deficiency of trust between residents in Southeast LA and DTSC and accusations of environmental racism (EGP Staff, 2015). Given the density of industrial operations in Vernon, Exide was not the first nor the last interaction between communities and DTSC, and in the case of Exide, they have poured considerable resources into rebuilding those bridges (personal communication, DTSC staff).

These narratives and the current unjust situation illustrate the necessity of including historical context and an environmental justice framing when analyzing the outcomes of industrial health crises, and should be used to inform the future. Vernon is able to export its industrial externalities to neighboring communities, since they have functionally no voice in how the city is run. Vernon has little incentive to clean up its act, since its leaders and its businesses receive significant benefit from the status quo. The surrounding communities lose out. The spatial politics of Vernon is crucial to understanding how a disaster like Exide came to be, and why nearby communities were, and still are, uniquely vulnerable to such events.

Progression of events

Detailed histories and timelines of the Vernon facility have been compiled by Southern California Public Radio (SCPR) and the *LA Times*[8] as living public resources, and will not be reproduced here. I highlight certain elements in order to contextualize and detail the policy responses to the ongoing crisis, and add key media coverage. Except where otherwise noted, the *LA Times* and SCPR timelines are the source for the following narrative, corroborated by primary documents from governmental agencies.

The facility that later became the center of the Exide Technologies crisis was converted into a lead-acid battery recycling facility in 1981 by Gould Inc. (Gould National Batter, GNB), under an "interim status document" from the California Department of Health Services, the precursor to the Department of Toxic Substances Control (DTSC). Soon after DTSC found high levels of lead contamination and indications of intentional leaking in 1999, the entire company was sold to Exide Technologies, an expanding lead battery manufacturer.

When Exide took the plant over in 2000, there was already a history of infractions. Although it took steps to improve pollution control systems, from 2000 to 2013 it accrued dozens of violations and was charged over $726,000 in fines and reimbursements to DTSC and AQMD. Violations ranged from lead contamination in drainage channels and lead dumping in the LA River to numerous air quality violations relating to excessive releases of contaminants including lead.[9] A 2006 attempt to regularize the plant's permit failed because of extensive negative public

[8] Available online at http://projects.scpr.org/timelines/exide-shutdown-timeline/ (Southern California Public Radio) and http://timelines.latimes.com/exide-technologies-history/ (Los Angeles Times).

[9] DTSC Inspection Reports for Exide from 1996 to 2015, compiled by Los Angeles Times reporter Tony Barboza, available at http://documents.latimes.com/exide-inspection-reports/. DTSC enforcement information can be found using ID: EXIDE TECHNOLOGIES INC (CAD097854541) at http://www.envirostor.dtsc.ca.gov/public/. AQMD Notices to Comply and Notices of Violation can be

feedback (DTSC, 2011), and was followed two months later by a $25,000 fine from DTSC for a series of violations in 2005 involving improper storage and handling of hazardous materials (DTSC, 2006).

In late 2007, falling ash and damage to nearby cars prompted community complaints. A resulting regulatory check revealed lead emissions at nearly twice the allowable levels for over four months. AQMD ordered Exide to reduce its production by half, along with ordering a number of specific changes to reduce emissions. These events were a key juncture. The original complaint in this incident was filed by Dr. Joseph Lyou, an activist from the Coalition for Clean Air and member of the Board of Governors of AQMD. For years, area residents had been aware of the poor air quality – not the least because of smells unrelated to Exide's facility – yet this potential focusing event for the most part faded away.

In particular, there was almost no media coverage; in searching news archives, only one *LA Times* article (Wilson, 2008) and no articles from SCPR or Eastern Group Publications, a group of local papers in Southeast LA, were found. The lone *LA Times* article reported that SCAQMD had air quality monitoring equipment in place, was aware of Exide's emissions, ordered a cut in production to reduce lead emissions, and assessed a fine against Exide (Wilson, 2008), which Exide contested. At the end of 2009, SCAQMD put air monitoring equipment at Resurrection Catholic School in Boyle Heights. Its preliminary results in March 2010 suggested that lead emissions from Exide, the main lead source in the area, were well within regulatory limits (Castillo, 2010). Later in 2010, SCAQMD decreased this limit on lead emissions from lead battery recyclers (Roosevelt, 2010).

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accessed via online search at http://www3.aqmd.gov/webappl/nov/. Neither source lists whether fines were assessed nor fine amounts.

Residents were present at meetings, concerned about air quality and their health, and Exide was on the radar. Pulido et al. (Pulido et al., 2016) point out that they had been engaged in air quality battles for decades, and had even tried to regularize Exide's permit in a wider movement in 1992. Exide was the only one that did not ultimately get a full permit (Garrison et al., 2013). But communities were not in possession of all the information, or aware of the full extent of the risks. At the community meeting in which AQMD shared the results from the school-site air monitoring, residents were told that "emissions from cars and trucks continue to be the main air-quality concern throughout Southern California" (Castillo, 2010). And the wider public, media and policy community were completely unaware of the ongoing issues with Exide.

Thus the stage was set for the main focusing event: the January, 2013 Health Risk Assessment (HRA) report that indicated that cancer risks for over 110,000 nearby residents were raised by 22 additional cases in one million people. For workers, the risk was raised by 440 cases in a million. The public notification level is 10 cases, and the action level for a risk reduction plan is 25 cases (Exide Technologies, 2013). These risks were primarily from arsenic emissions, but the increased scrutiny on the facility led to discoveries of other violations. The HRA was the beginning of the slow end of decades of infractions and fines, yet it represented a crisis in the eye of the public and the affected communities.

Focusing events are harmful or reveal potential for future greater harms, are or could be concentrated on a definable geographic area or community, and are known to policy makers and the public roughly simultaneously (Birkland, 1997, p. 22). Given the regulatory history of Exide's Vernon facility, local enforcement teams within SCAQMD and DTSC were at least to a degree aware of the potential risks it posed, and potentially negligent in not taking direct action sooner. Residents were aware of ash, smells, and other issues that potentially originated from

Exide but could not have known about the extent of invisible lead or arsenic emissions. While these risks may have been known to some enforcement officers, they were not known to the public, public health experts or local or state elected officials. The real function of the report was illustrating the *degree* to which Exide's emissions were a problem, and to whom.

So what was the response? Table 3.2 outlines key events in the period after the report, climaxing with the closure of the facility, but far from ending there. The very length of this timeline – which excludes thousands of hours of community organizing and the efforts of local residents, a number of legal cases, and many other important facets of the saga – illustrates the protracted process of resolving the issues the Exide crisis raised.

Table 3.2. Abridged timeline of events at Exide Technologies' Vernon facility

2013	
Jan. 15	The original report indicating elevated cancer risks to nearby residents and workers, "Revised AB2588 Health Risk Assessment" (HRA), is submitted to SCAQMD. The public is not immediately given information it contains, and it is two months before the HRA is approved and SCAQMD takes action.
Feb. 22	Rep. Manuel Pérez introduces AB 1329, which would require DTSC to prioritize enforcement actions affecting the most impacted CalEnviroScreen communities. There is no evidence it was prompted by revelations about Exide.
Mar. 24	The facility is ordered by SCAQMD to reduce its lead emissions and to hold public meetings to notify residents about the findings in the HRA.The *Los Angeles Times,* other local newspapers, and local radio stations report on the HRA and SCAQMD's order.
Apr. 24	In a highly unusual move, DTSC regulators order a suspension of operations at the Exide plant due to leaking pipes underneath the facility (Pulido, Kohl, & Cotton, 2016). Exide challenges this order in court. By July 2, the judge sides with Exide and allows it to resume operations pending a full hearing.
Aug. 27	DTSC officials order Exide to begin testing dust and soil in surrounding homes to determine whether dangerous metals have accumulated. Initial results from 39 homes are not available until March 2014, and show elevated levels of lead in every home screened.
Aug. 27	At this point, eleven articles in the Los Angeles Times have covered events regarding Exide, from the HRA, to temporary shutdown and ensuing legal battle, to lead testing.
Sep. 12	The LA County Department of Public Health offers free blood testing for lead poisoning. This can only test exposure in the past six months. The first tests do not take place until April 2014, six months later.
	Sep. 19 and Oct. 3, Exide exceeds lead emissions limits; both are reported in *LA Times*.

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Oct. 7	DTSC announces a deal with Exide to keep its Vernon plant open. DTSC will issue an order requiring Exide to clean up leaky storm pipes and control toxic air emissions. Exide will establish a $7.7 million fund to pay for cleanup of past violations, blood lead tests for local residents and workers, and other environmental tests.
Oct. 18	SCAQMD lawyers petition the district's hearing board to temporarily shut Exide down for "failing to adequately capture and control gaseous emissions from its blast and reverbatory furnaces, including...arsenic" (Christensen & Garrison, 2013)
Dec. 19	DTSC issues emergency order directing Exide to clean up lead and other metals that have been deposited near its Vernon plant, saying rains could wash toxins into the LA River. Testimony on the SCAQMD petition calling for a shutdown at the facility is *still* being heard, including from residents with health concerns and Exide officials claiming that emissions have plummeted in recent months.
Dec. 27	The *LA Times* publishes an exposé on DTSC, revealing many incidences of mismanagement, failure to recoup costs, and failure to enforce environmental regulations statewide (Garrison, Christensen, & Poston, 2013)

2014

Jan. 10	SCAQMD governing board votes unanimously to lower the allowable limits for arsenic, benzene, and 1,3-butadiene emissions from battery recyclers (rule 1420.1), with a 1-year full compliance window. It affects Exide, and Quemetco in the City of Industry. Exide does not challenge the new level, but sues in the LA Superior Court and directly to SCAQMD for more time for compliance. In April, the LA Superior Court ruled against Exide and AQMD denied its request for a hearing. A third violation in lead emissions since January 2013 is found.
Jan. 16	DTSC requests an increase in state funding. SCAQMD files a civil suit for $40 million in penalties against Exide, alleging numerous violations for lead and arsenic emissions. On Feb. 18, 2014, the amount was increased to $60 million. On May 29, 2015, the amount was increased to $80 million.
Jan. 23	Sen. Ricardo Lara of Bell Gardens introduces SB 712 in the State Senate, which would give DTSC until Dec. 2015 to regularize Exide's Vernon permit. A second law, SB 812, broadly tightens DTSC permitting requirements. SB 712 is signed into law Sep. 19.
Mar. 11	L.A. County announces the creation of a toxic pollution 'strike team,' with Exide first on its list. The team will include health officials, prosecutors and fire department officials. The strike team does not become active until mid-2016, and as of December 2016, scant information is available on its structure, members, or activities.
Mar. 14	Exide facility is shut down to upgrades to comply with new regulations.
Mar. 20	After three attempts, Exide and SCAQMD make a plan to reduce arsenic risks. SCAQMD is still trying to halt smelting operations until a long-term solution is found.

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Mar. 21	Initial residential lead testing shows elevated levels of lead at all 39 homes and two schools screened, prompting plans for a second round of testing. The first soil removals, in Boyle heights, begin in August.
Mar. 28	*LA Times* reports Exide's emissions once again exceed regulatory thresholds. It was not operating at the time, and may be from disturbing lead-containing dust (Garrison, 2014) By the end of March, close to the one-year anniversary of SCAQMD's original emission reduction order, the *LA Times* has published close to 40 articles about Exide.
Apr. 9	SCAQMD denies Exide's petition to resume smelting operations
May 2	DTSC Director Debbie Raphael steps down. Sen. De León commented, "The departure of such a highly-qualified leader…indicates to me that DTSC may be beyond repair…it's time for a major restructuring of DTSC" (Barboza & Garrison, 2014). The new Director, Barbara Lee, is not appointed until October. She is the eighth Director of DTSC in eleven years (Garrison et al., 2013).
May 22	Federal EPA gets involved, issuing a citation for lead emissions violations under the FCAA on more than 30 occasions (various days from Sep. 9 2013 to Apr. 19 2014).In August, they begin inspections of Exide, which continue for at least seven months.
June 17	DTSC sets 30-day deadline for Exide to fix its permit or lose permission to handle hazardous waste at its Vernon facility. On July 11, the facility is allowed to reopen, with stipulations for new pollution controls.
July 24	*LA Times* publishes an editorial lambasting DTSC and supporting SB 812 (LA Times Editorial Staff, 2014), and Aug. 7 publishes an audit of their financial mismanagement (Barboza, 2014).
Aug. 11	The LA County Board of Supervisors writes a letter to Gov. Jerry Brown criticizing DTSC for slow progress in testing and clean-up of lead around Exide. It asks the governor to ensure the cleanup of all 39 homes near Exide with elevated levels of lead.
Sep. 29	With both SB 712 and SB 812 on his desk, Governor Jerry Brown signs SB712 into law.
Nov. 6	The state orders Exide Technologies to pay for the cleanup of homes and yards contaminated by its battery recycling plant in Vernon. Regulators fine Exide $526,000 for improperly managing hazardous waste.
2015	
Jan. 9	Sen. De León, Sen. Lara, and Rep. Santiago introduces a bill to borrow $176.6 million from the state general fund for testing and cleanup around Exide and to implement a job training program. It takes more than a year to pass and be approved by the Governor.
Mar. 6	SCAQMD again lowers emissions standards on lead battery recyclers, affecting only Exide and Quemetco of the City of Industry. Senate President Pro Tem Kevin de León writes to DTSC, urging them to permanently close down Exide's Vernon facility.
Mar. 12	Exide Technologies will permanently close its Vernon plant and avoid criminal charges under an agreement with the U.S. attorney's office. An additional $38.9 million will be added to the existing cleanup fund for the facility itself, bringing the total to $50 million.
May 28	DTSC forms Exide Advisory Group (EAG) to oversee the community cleanup process.

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July 1	Governor Brown signs 2015-16 budget. It includes $13 million budget increase for DTSC to support permitting and hazardous waste oversight, and establishes a 3-member oversight panel. DTSC will fund a new assistant director for EJ and new positions to monitor hazardous waste facilities. These reforms were spearheaded by Sen. De León, Sen. Lara, other Exide-area legislators, community activists, and state EJ organizations.
Aug. 21	DTSC announces $7 million for Exide, borrowed from budgeted cleanups at other sites; community members continue to criticize the pace of testing and cleanup.
Oct. 29	Residents within 1.7 miles of Exide can sign up for residential lead testing online.
2016	
Jan. 14	Martinez publishes her article, "Exide, Porter Ranch: A Double Standard?" The idea is more widely disseminated two weeks later by the *Los Angeles Times.*
Feb. 19	Rep. Gatto introduces AB 2748, which applies *only* to Exide and Aliso, and would expand victims' ability to claim compensation.
	AB 2748 is vetoed by Gov. Brown on Sep. 26.
Apr. 20	Governor Brown approves $176.6 million "loan" for Exide cleanup; regulators hope to recover costs from Exide Technologies. Original proposal exempted the cleanup from the lengthy requirements of CEQA, but subsequent discussions reinstated the requirements.[10]
Nov. 30	As of almost four years after the HRA, the *LA Times* has published approximately 90 articles on Exide, DTSC, and toxics control in the state of California.

At several points in the time frame overviewed in Table 3.2, Exide's emissions exceeded 3-month total emissions limits, and its operators voluntarily stopped operations in order to comply. Regulators also learned about other ways in which Exide was violating environmental regulations, such as trucks leaking toxic waste in the Exide yard and on highways, and damaged pipes under the facility. Yet these regulators did not immediately notify the public. This lack of transparency hearkens back to the community's issues with DTSC and raises the question of institutional trust, one aspect of industrial health crises that shapes how they operate as focusing events, as will be further discussed in Chapter 5.

[10] The California Environmental Quality Act (CEQA) requires any project affiliated with the State to complete an Environmental Impact Report (EIR) outlining potential environmental impacts of the project, alternatives and plans for mitigation. Here, the issues involved in remediation are substantial, which is why some argued for the completion of the EIR, but it is a lengthy process that is further slowing down cleanup efforts.

To address the problems at Exide, government agencies (SCAQMD, DTSC), private parties, and federal prosecutors all pursued limited legal actions. Multiple class action lawsuits were filed and some were consolidated, resulting in a $14.75 million settlement with the plaintiffs in March 2016 (Meyer, 2016), which does not begin to cover estimated clean-up costs of over $400 million (Barboza, 2016). In August 2014, a federal grand jury subpoenaed Exide for documents about transportation of hazardous materials and air emissions for a criminal investigation. This information was only released in a financial disclosure to the federal Securities and Exchange Commission (SEC), and the case was settled with the closure of the Vernon facility in exchange for exemption from criminal liability. A third case, filed in the LA Superior Court by families affected by the pollution, alleged that Exide officials willfully endangered the health of more than 60 children living near the Vernon facility (Christensen & Barboza, 2014). Although these legal settlements were doubtlessly important in achieving some compensation for some residents and workers affected by Exide, they do not carry larger policy implications and therefore will not be further discussed.

Outcomes

"Se me murió mi señora, se me murió mi cuñado… yo no quiero que muera más gente. Esto es lo que pido de ustedes."
Translation: *"I have lost my wife and my brother-in-law… I don't want more people to die. This is what I ask of you."*

Maywood resident Marcelo Hernández,
quoted in StreetsBlogLA and described as "visibly unwell" (Sulaiman, 2014)

Various aspects of the vulnerability of the communities that Exide impacted have been discussed: low incomes, communities consisting almost entirely of Latinx residents, many of whom are immigrants and/or have low language proficiency, low educational attainment, economic dependence on the origin of risk, and unincorporated residential neighborhoods. I will

analyze the role of these community characteristics in relation to industrial health crises in Porter Ranch and the neighborhoods surrounding Vernon in greater detail in Chapter 5.

In addition, the lead and arsenic released by Exide has meant that a number of homes in the area require extensive, costly cleanup. For the working class people who own these homes, the achievement of home-ownership, a mark of success and crucial pathway to intergenerational wealth building, becomes a nightmare as property loses value and assets evaporate. At an Exide Advisory Group (EAG) meeting, the LA County Assessor's Office and EAG members reported that housing prices have not fallen,[11] but have also not risen at the breakneck pace of other comparable Los Angeles housing stock (Prang, 2016), although I have not found secondary confirmation of these facts. Without these assets, many are trapped in homes they know are toxic, compounding their exposure, particularly for those with children. Unlike in Porter Ranch, where relocation was arranged for the duration of the crisis and where long-term contamination is not likely to be persistent (AQMD, 2016), in Boyle Heights and East LA, many are completely unable to relocate, and the crisis is permanent.

This is part of the reason that criminal liability is important. Regulatory action and current civil cases have provided some funds for cleanup, but not enough to cover the impacts of the contamination. Criminal cases would both answer communities' feelings that they have been cheated and abandoned, and a strong basis for further civil damages for affected residents. As it is, families are left with almost no recourse for their loss. The public agencies that both "allowed" Exide to pollute and that agreed to a deal which precluded criminal liability are

[11] This is a tricky issue in California. Proposition 13 (1978) established that property taxes would be assessed on market value at purchase and could only increase by 2% per annum. Thus, especially in the Los Angeles area, assessed values are often lower than market values, so for any long-held property, even if the assessed value drops, it may not drop so far as the original market price. That being said, the Assessor's office found that out of 5253 properties examined, only 23 warranted a "value reduction" resulting in a property tax decrease.

complicit in this outcome, yet for the most part, such agencies are also immune from liability. To be fair, agencies' actions are circumscribed by the need to obtain *any* cleanup funds from the responsible company, by existing laws and procedural requirements, and by their own capacity. This balancing act illustrates the delicate role that agencies play as both contributors to, and mediators in the resolution of industrial health crises, and thus the limits of regulatory solutions. For Exide's Vernon plant in particular, it is still unclear whether the facility was nearly continuously in violation of air quality standards, as it appears, and this led to the extreme contamination of soil, or whether such levels would be possible even had they been within regulatory limits; Exide itself argues that the contamination cannot be squarely blamed on them (Small & Rose, 2015). This contestation over the causes and effects of pollution is one important aspect of industrial health crises that affects their ability to operate as focusing events; the dissensus over the crisis itself leads to complications in responses (see p. 68 for further discussion).

As of November 2016, nearly four years after Exide gave the initial report to SCAQMD, the process of completing health and residential soil screenings is ongoing. DTSC has tested 2,711 properties for lead, out of approximately 10,000 in the Preliminary Area of Investigation (PIA; see Figure 3.2, following page), which includes all properties within 1.7 miles of Exide. The results are grim. Any soil with lead levels over 80 parts per million (ppm) necessitates further testing, and 2,655 houses exceed this limit. Anything between 400-1000 ppm is hazardous in areas with children, and 743 houses fall in this range. Any soil with lead concentration greater than 1000 ppm is hazardous in all situations, and 52 houses exceed this limit. Cleanup is ongoing, but the cost for full cleanup is estimated to be $400 million, compared to the $176.6 currently provided (Barboza, 2016).

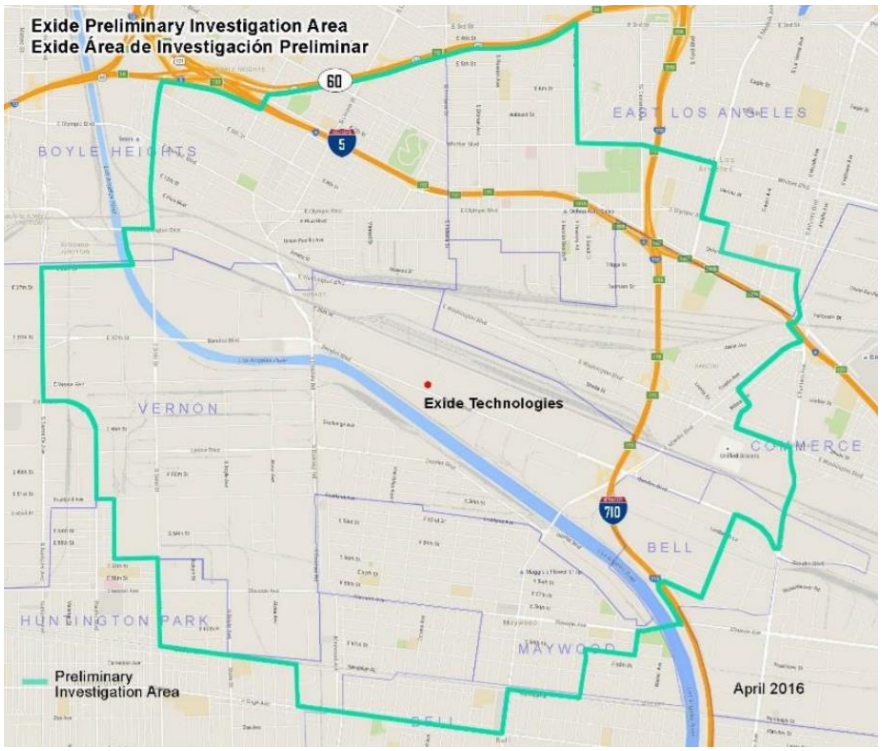


Figure 3.2 DTSC's Preliminary Area of Investigation, from Exide Cleanup Fact Sheet (DTSC, 2016). The 5 (east-west) and the 710 (north-south interstates, and the Los Angeles River are visible.

Community members are fed up and frustrated with the slow pace of cleanup and what they perceive as a lack of attention to a public health crisis. As one resident from unincorporated East LA with soil lead levels tested at more than 1200 ppm said, "I'm living in toxic dirt, and I feel like I'm being left in the dirt" (statement in public Exide Advisory Group meeting, Oct. 20, 2016). As we shall see in the next chapter, all industrial health crises do not have outcomes like these. Porter Ranch, the neighborhood struck by the gas leak at the Aliso Canyon natural gas storage facility, was affected and treated very differently than the neighborhoods surrounding Vernon.

Chapter Four

Aliso Canyon

"The damage the gas has caused to residents, the environment, the economy, is unprecedented."
Mitchell Englander, Los Angeles City Council representative for Porter Ranch
Quoted in the *Los Angeles Times* (St. John & Walton, 2016)

On October 23, 2015, residents of Porter Ranch thought their homes' pipes were leaking natural gas. Multiple searches and checking outside did not identify the source of the smell, and within a few days, not only was the irritating odor persisting, it was getting worse. Residents developed nosebleeds and headaches, but calls to SoCalGas, the owner of the nearby natural gas storage facility, yielded no answers.

It was indeed a massive gas leak from a failed well within the Aliso Canyon facility. Despite denials and obfuscation from SoCalGas and regulatory agencies including the Department of Oil, Gas, and Geothermal Resources (DOGGR), SCAQMD, and CARB, SoCalGas and these agencies were already trying to characterize the leak and figure out how to plug it. But they had no success, and as residents' suffering stretched into weeks, their calls for action grew louder. By November, hundreds of residents relocated, paid for by SoCalGas (Walton, 2015), and two local schools were also relocated after winter break (Blume, 2015).

The technical challenges of plugging the leak caused continued delays, and it was not fully and finally plugged until February 18, 2016. An estimated 109,000 metric tons of methane and other gases had been released (CARB, 2016a). Residents returned home, but protests against

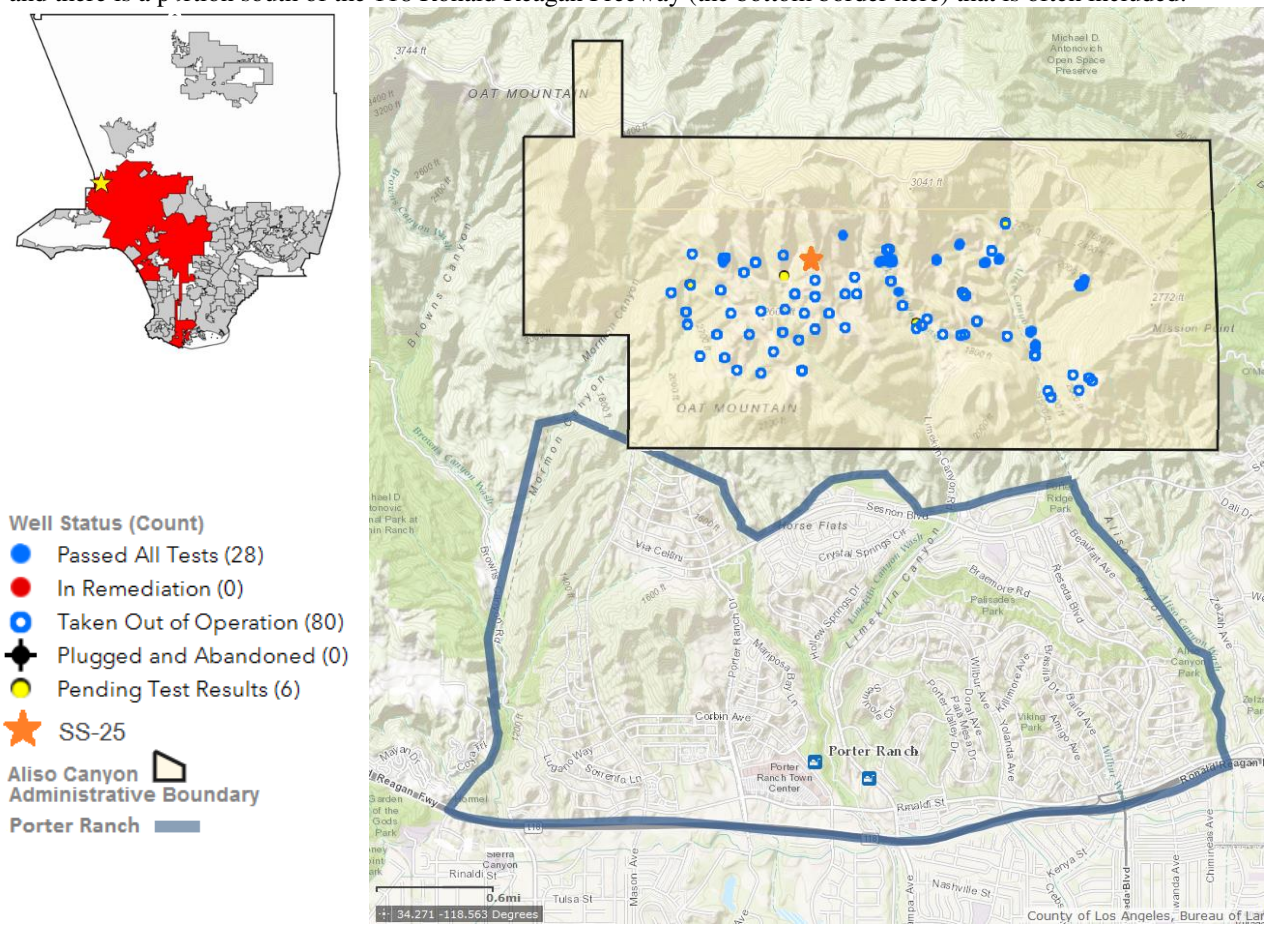
the gas company and demands for a permanent shutdown of the Aliso Canyon facility have continued a year after the original leak began. So what factors allowed Porter Ranch residents to move quickly after the leak began? In what ways do clean-up and closure efforts parallel and diverge from events regarding Exide? What have been the policy ramifications of the leak?

A local history

Aliso Canyon is located in the Santa Susana Mountains, the northern boundary of the San Fernando Valley, northeast of downtown of Los Angeles. According to government records (Baker, 2014; Division of Oil and Gas, 1959; DOGGR, n.d.), in 1938, J. Paul Getty's Tidewater Associated Oil Company developed the canyon for fossil fuel production. By the late 1950s, there were 118 active wells on the site, managed by multiple different companies (see Figure 4.1). The well that failed in the 2015 leak, SS-25, was drilled in 1953. The site has been productive ever since, though decreasingly so, and to this day has active oil wells (Baker, 2014). In fact, a 2014 proposal by the Termo Company to drill 12 new wells in the field is what catalyzed the formation of Save Porter Ranch (SPR), a local organization that has worked to mobilize the community against the oil and gas development in the Aliso Canyon field.

In 1973, SoCalGas's predecessor, Pacific Lighting, purchased the partially-depleted field and refitted it for natural gas storage, including well SS-25. In natural gas storage, appropriate geologic sites can hold natural gas until it is needed for energy production. Often depleted oil or gas fields work well, because they have the required rock structure: capacity to hold gas and impermeable layers to prevent leakage. The site became SoCalGas's largest natural gas storage facility, providing the greater Los Angeles area with a reliable source of fuel even at peak demand (Baker, 2014; Division of Oil and Gas, 1959; DOGGR, n.d.).

Figure 4.1a (left): Los Angeles County. City of LA in red; other cities in gray; yellow star at Porter Ranch. Adapted from Wikimedia Commons**. Figure 4.1b (right): Aliso Canyon Oil and Gas Field and Porter Ranch as of October 29, 2016.** Adapted from DOGGR's online well mapping tool (DOGGR, 2016) and LA City Council maps. Since Porter Ranch is a neighborhood of Los Angeles and not an incorporated entity, its boundaries are not defined and there is a portion south of the 118 Ronald Reagan Freeway (the bottom border here) that is often included.



Concurrent to the development of Aliso Canyon into a gas storage field, the land nearby was gradually becoming populated (Nelson, 2007; Newman, 1999; "Porter Ranch," n.d.). Prior to the 1960s, Porter Ranch was primarily home to horse ranches. But Los Angeles was a booming metropolis, and in that decade, the first houses were built in the hills directly south of the Aliso Canyon field. Major development began in the 1970s, when successful developer Nathan Shapell began building expensive suburban communities. According to the *Los Angeles Times*'s Mapping LA project, the community remains relatively affluent and well-educated (see Table 4.1). Porter Ranch also has excellent public schools; none have an Academic Performance

Index (API)[12] score below 8/10, and four out of seven schools have a perfect 10/10. This is a clear contrast Southeast LA, where more than half of the schools had less than 4/10.

Given the nature of the leak, the communities surrounding Porter Ranch may have also been exposed, though not to the same degree. Much less focus has been placed on them, and detailed exposure predictions are not available, although some did suffer similar symptoms and complain (see Fig 4.2). Regardless, it is worth noting that, according to the *LA Times* Mapping LA project, the neighborhood directly to the east of Porter Ranch, Granada Hills, has a lower median income, lower proportion of four-year university graduates, and greater proportion of households with incomes less than $20,000 a year (LA Times, 2010). Public schools are good, but not quite as good. In general, Chatsworth, the neighborhood to the west, is comparable.[13]

Table 4.1. Demographics of Porter Ranch and surrounding neighborhoods

		Porter Ranch	Granada Hills	Chatsworth	City of Los Angeles†
Total Population*		30,571	53,998	37,102	3,790,000
Distribution, %	White	61	56	66	29
	Asian	27	16	14	11
	Black	2	3	2	10
	Latino/a	8	21	14	49
	Other	3	4	4	5
	Foreign born	34[1]	29[2]	25[1]	39
	Median age (yr)	41	37	40	35
Have less than a high school diploma, %		7.0	13.0	10.9	25.1
Have 4-year degrees, %		51.4	32.7	24	31.5
Median household income, $		121,428	83,911	84,456	49,682
Households earning less than $20,000, %		6.6	11.9	11.5	22.4‡

* In 2008, LA Department of City Planning estimates
† All data from 2010 census
‡ In poverty (usually more than $20,000)
[1] Most commonly from Korea and the Philippines
[2] Most commonly from Korea and Mexico

[12] API (Academic Performance Index) is a metric formerly used by California under the 1999 Public Schools Accountability Act, which measures schools' academic performance and growth on a variety of parameters. All school statistics in this paper include a one-mile radius around the neighborhood/city, except Vernon.
[13] Data for Chatsworth includes the westernmost part of Porter Ranch, due to the *LA Times'* neighborhood map.

SoCalGas has been part of a parent company, now called Sempra Energy, since the 1920s. Sempra is a Fortune 500 energy services company which operates natural gas pipelines, gas-operated power plants, and storage facilities. Kathleen Brown, Governor Jerry Brown's sister, serves on the board of Sempra, which led to accusations that Gov. Brown put family ties and finances before the needs of his constituents. A graphic put together by LittleSis, an organization dedicated to visualizing the connections between organizations and people in power, illustrates numerous other financial and political ties between SCAQMD, the governor, legislators, and Sempra and SoCalGas.[14] Alexandra Nagy, an organizer with Food and Water Watch (FWW) who has been working on organizing in Porter Ranch, was quoted in the *LA Daily News*: "Governor Brown's silence on the Porter Ranch gas leak is immoral and egregious given his conflict of interest and close ties to Sempra… A real climate leader wouldn't let family ties get in the way of protecting Californians from a massive public health and climate disaster" (Bartholomew & Knickmeyer, 2015).

Nagy's statement illustrates the current conflict over the facility, a conflict that is influenced by a number of key characteristics and historical interactions. The facility predates the community, and that its location is heavily circumscribed by specific geological formations, and cost and infrastructural need for proximity to the city. This is in contrast to many other potentially hazardous facilities, which have greater locational flexibility. However, SoCalGas itself provided evidence that the infrastructure at Aliso Canyon was not always well-maintained, and that issues with well failures and leaks had been increasing in recent years. Not one year

[14] The map is available via http://littlesis.org/maps/1227-regional-air-quality-regulator-in-l-a-under-scrutiny-for-lax-handling-of-socalgas-leak

before the leak, they presented before the CPUC on their plans for upgrades in response to the issues at their underground storage facilities (Baker, 2014).

The development of Porter Ranch was not hindered by Aliso Canyon's presence; if brought up at all, it was considered a non-issue, including by residents (Abrams, 2016). Despite a number of other social advantages that many Porter Ranch residents possess, and the activism of some residents through SPR, many were unaware of the facility. This lack of awareness precluded planning for potential risks. Such planning could have included air filter installations, emergency housing arrangements for those with poor health, response plans with SoCalGas and local government agencies, et cetera. None of this occurred.

Evaluating the impacts of the gas leak on residents of Porter Ranch is complex. There is no question that the gas leak had significant effects on local residents; many complained of the smell, suffered overt medical symptoms including nosebleeds, headaches, and nausea, symptoms of existing medical conditions were exacerbated. Many residents blame health issues, and even the death of pets, on the leak in ways that have not been epidemiologically linked to methane gas or mercaptans (the chemicals used to odorize natural gas), but epidemiological studies are sparse. Studies conducted by SoCalGas (McDaniel, n.d.) and multiple government agencies (AQMD, 2016; LA DPH, 2016; Monserrat [OEHHA], 2016) have stated that no lasting health impacts are expected from the leak.

The response was high-powered and as noted above, culminated in the extremely expensive relocation of thousands of private citizens who lived in the afflicted area. The total final cost was $78 million (SoCalGas, 2016). This was likely facilitated by the connections of those in the community, and their relative political-economic power – for example, the quote at the opening of the chapter from Mitch Englander, the City Council representative for Porter

Ranch and nearby neighborhoods – which *prevented* continued exposure and the persistence of the risk. Porter Ranch, once it learned of the hazard through its own experiences and suffering, was able to end the risk by removing itself from the hazard. That being said, not all residents were able or willing to move, and a closer look at who was or was not able to relocate, to access reimbursement from SoCalGas or at the least home air purifiers, is important. Such a level of detail is not currently available, but it is worth investigating.

At the same time, vulnerability of communities must also be understood in light of the *outcomes* of a crisis. Once the leak occurred, there were a number of branching possibilities for the outcomes, from no action to protect residents, through a spectrum of mitigation efforts, to complete evacuation of residents to eliminate the health hazard. This final option is what actually occurred. The relative political power and social mobility of the community enabled it to respond to the events faster and more thoroughly than other communities, a fact I will explore more later, but that I now consider in a discussion of vulnerability and context.

Progression of events

"This was supposed to be my home, I was supposed to retire here… I have become fearful… afraid to leave my house, afraid to stay in my house."

Porter Ranch community member, One Year Later protest (personal observation)

When the gas leak was discovered on Friday, October 23, it was not immediately reported to any relevant agency, likely due to uncertainty about its severity. There were no injuries, fatalities, media coverage, or interruptions, so reporting was up to the discretion of the operator. Since the leak was in the storage facility itself, not in distribution pipelines, it was within the jurisdiction of DOGGR and not CPUC, and SoCalGas notified DOGGR the day after the leak began, although the original notification record was not found. The first mention in the public record is on October 25, two days after the leak started, in a notification to the California

Public Utilities Commission (CPUC) stating: "Leak from an existing Aliso Canyon gas storage well. No ignition, no injury. No media. Notification due to operator judgement only. Reported to DOGGR. Failure under investigation" (SoCalGas, 2015b). Residents were not officially notified about the leak at this point.

However, residents could smell the gas and some were experiencing symptoms including dizziness, nausea, and headaches (Hawkins, 2015). On Monday, October 27, there were complaints from Porter Ranch residents to the CPUC: "There was a gas leak in Aliso Canyon Storage on 10/23/2015. Customer is smelling the gas and the leak has not been fixed yet" (CPUC, 2015), and SoCalGas publicly acknowledged the leak. The first mention found in media is the following day from KTLA, a local commercial news station, which reported that SoCalGas had sent representatives to talk to community members and was working with firefighters and schools to ensure public safety (Hawkins, 2015).

In the following days, official information was still scarce. On October 30, Rosemary Jenkins, writing for *LA Progressive*, stated (2015):

> [A] previously announced meeting at Shepherd of the Hills Church was held right after [the] serious gas leak was discovered... Yet [SoCalGas]/Sempra did not address at that meeting the concerns over what is undoubtedly a serious incident. The company denies there is a problem, attributing what occurred to a "normal gas-releasing process" that is done once a month. Perhaps because of these staunch denials, it is impossible to find any coverage in our newspapers and television and radio media about it…The reality, however, shows otherwise. Community members have made every effort to contact the proper authorities for answers and actions. The Gas Company and the AQMD have finally gotten involved but claim they are waiting for a Texas expert to arrive to analyze the issue.

At this point, residents had begun protesting the leak and their inability to get information about it (Jenkins, 2015). Despite the lack of transparency, local governmental agencies were in fact already working with SoCalGas to evaluate the leak and its potential impacts. SoCalGas released an update that same day stating (2015a):

> We are working with the L.A. City and County Fire and Hazmat Departments, the L.A. County Department of Health, the California Division of Oil and Gas & Geothermal Resources, and the South Coast Air Quality Management District – as well as world-renowned experts in natural gas well management.

None of these agencies have public documents available about their actions during this time, but well sampling data starting from October 30 is available from SoCalGas..[15] Their actions over the next weeks became somewhat more transparent, although residents still felt that they were being manipulated, and that information was being withheld (personal observations, One Year Later protest). The first mainstream coverage did not appear until November 20, in the *LA Times* (Barboza, 2015b). By the end of November, residents had begun relocating of their own volition, and eventually over 8,000 households were living in temporary housing (McNary, 2016b). Required to do so by a court case, SoCalGas paid for the housing, along with some food and gas costs, with an ultimate price tag over $58 million (McNary, 2016a). However, it is important to note that the very structure of these payments – residents could move then request reimbursements at fixed rates – meant that only certain families could afford to relocate. In this case, the "solution" worked because residents facilitated the cost coverage, which is *not* the case in the communities around Vernon.

[15] Full sampling data from SoCalGas as well as CARB and SCAQMD:
https://www.socalgas.com/newsroom/aliso-canyon-updates/aliso-canyon-air-sample-results
https://www.arb.ca.gov/aqmis2/display.php?param=CH4&units=007&year=2015&report=SITE1YR&statistic=DAVG&site=5433&ptype=aqd
http://www.aqmd.gov/home/regulations/compliance/aliso-canyon-update/air-sampling

Table 4.2. Abridged timeline of events at SoCalGas's Aliso Canyon facility

2014	
Apr., n.d.	Save Porter Ranch (SPR) is created after Termo Company presents at a Porter Ranch Neighborhood Council meeting about drilling 12 new wells in the area. SPR soon partners with Food and Water Watch (FWW) to engage in local organizing.
Aug. 15	*Los Angeles Daily News* covers a small protest against new drilling near Porter Ranch and publishes response letters over the next three weeks (Bartholomew, 2015).
2015	
Oct. 23	Gas leak discovered and reported to DOGGR shortly thereafter.
Oct. 26	Gas leak reported to CPUC. SCAQMD begins air sampling in response to community complaints; this occurs sporadically, but SCAQMD begins regular sampling Dec. 21.
Oct. 27	Gas leak reported to CalOES / State Warning Center.
Oct. 28	First very brief update from SoCalGas. First report found in the media (Hawkins, 2015), which mentions that SoCalGas representatives are hosting an informational booth in Porter Ranch. First mention in the *LA Daily News* is on Oct. 29 (Wilcox, 2015).
Nov. 1	OEHHA begins air quality sampling above Aliso Canyon and Porter Ranch.
Nov. 12	SoCalGas meets with Porter Ranch Neighborhood Committee, along with representatives from DOGGR, SCAQMD, LA County Fire Department (Health and Hazardous Materials Division), San Fernando Valley Field Deputy, County Supervisor, LA County Department of Public Health, and an environmental epidemiologist.
Nov. 13	Attempts to plug the leak result in release of a mist of brine and drilling fluid over Porter Ranch; residents are cautioned to stay indoors for several hours.
Nov. 19	Although SoCalGas has offered relocation support, few residents have done so. The LA County Dept. of Public Health orders SoCalGas to pay for relocation of residents. Within two weeks, over 30 families have relocated (Favot, 2015; Wilcox, 2015).
Nov. 20	*LA Times* publishes first article on gas leak, and reports that SCAQMD has received 499 odor complaints (Barboza, 2015b).
Dec. 2	Class action lawsuit is filed by a group of Porter Ranch residents and Save Porter Ranch, later given support from famed environmental activist Erin Brockovich and from Robert F. Kennedy, Jr. (Favot, 2015b; R. Rex Parris Law Firm, 2015).
	LA Daily News article warns of potential long-term health effects from prolonged exposure to chemicals in leak (Favot, 2015).
Dec. 4	Relief well drilling begins. Its estimated date of completion is in February.
Dec. 7	Los Angeles City and County sue SoCalGas, with accusations of violating health and safety codes, public nuisance laws, hazardous materials reporting requirements, and engaging in unfair business practices, seeking civil penalties, restitution and injunctions.
	CARB begins aerial testing for potential GHG emissions impacts.
Dec. 16	SCAQMD deploys two air monitoring trailers, one at LAUSD property and one in Porter Ranch (more specificity not given), to measure methane and other hydrocarbons. High methane readings trigger the collection of additional grab samples.

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Dec. 17	LAUSD decides to relocate students from two schools after winter break ends on Jan. 12.
Dec. 21	SCAQMD begins 24-hour integrated sampling, in which multiple samples are taken over a 24-hour period (see Footnote 4).
Dec. 22	City of LA sues SoCalGas to increase the pace of resident relocations. 2,092 households have been moved and 2,684 households are awaiting relocation (Walton, 2015).
2016	
Jan. 4	Governor Jerry Brown meets with Porter Ranch Neighborhood Council.
Jan. 6	Gov. Brown declares state of emergency in Porter Ranch. Full details on p. 57.
Jan. 8	SCAQMD Board of Governors unanimously approves measure advising that SoCalGas's mandatory GHG mitigation project(s) be done for the benefit of Porter Ranch
Jan. 11	SoCalGas begins 12-hour sampling at 9 locations within or adjacent to facility.
Jan. 28	SoCalGas agrees to put air purifiers and filters in all schools within five miles, although most cannot smell the leak (Blume, 2016).
	The *LA Times* runs a story with narratives of Porter Ranch residents (Gerson, 2016).
Feb. 2	L.A. County Dist. Atty. Jackie Lacey files 4 misdemeanor criminal charges against SoCalGas, accusing it of releasing air contaminants and neglecting to report the release of hazardous materials until three days after the leak began.
	State Atty. Gen. Kamala Harris joins in the civil suit pending in the LA Superior Court. bringing the total to 11 local, state, and federal agencies investigating or suing SoCalGas.
Feb. 11	Leak is temporarily controlled via mud injection through relief well.
Feb. 18	Leak is successfully permanently plugged. Residents are given eight days to move back from temporary housing; some still suffer adverse health effects.
Feb. 25	An LA County judge orders SoCalGas to continue covering relocation costs for an additional 22 days, through March 18 (Sewell, 2016a).
Mar. 4	DOGGR orders specific actions regarding the Aliso Canyon facility, including testing wells and installing new safety equipment (DOGGR, 2016).
Mar. 18	Shortly before March 18, an agreement between residents and SoCalGas extends relocation funding an additional week (Sewell, 2016b).
Mar, 31	The *New York Times Magazine* publishes "The Invisible Catastrophe" on the gas leak in Porter Ranch (Rich, 2016).
Apr. 1	Pres. Obama convenes Interagency Task Force on Natural Gas Storage Safety (ITF)[16]
	SCAQMD approves $600,000 for health impacts study, in coordination with the National Academy of Sciences, but will seek cost reimbursement from SoCalGas.

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[16] ITF included: Dept. of Energy, Dept. of Transportation's Pipeline and Hazardous Materials Safety Administration, federal EPA, Dept. of Health and Human Services, Dept. of Interior, the Federal Energy Regulatory Commission, and the National Oceanic and Atmospheric Administration, in collaboration with the State of California, Los Angeles County and the City of Los Angeles. Final report: https://www.alisoupdates.com/1443739975368/Reliable_Underground_Natural_Gas_Storage.pdf

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Apr. 8	A collaborative "Aliso Canyon Action Plan to Preserve Gas and Electric Reliability for the Los Angeles Basin" is released (California Department of Energy, 2016).
May 11	OEHHA releases a study on their website indicating that residents have no expected long-term health impacts from the gas leak.
May 20	An LA County Superior Court judge supports a LA Department of Public Health order for SoCalGas to pay to clean approximately 2,500 homes, if residents request it before they return from temporary housing (McNary, 2016b). In late May, cleaning was temporarily stopped due to concerns over the techniques and contractor being used.
July 26	CARB removes six air quality monitors. SCAQMD is still operating two, in addition to a benzene monitor previously run by CARB (a second benzene monitor is removed).
Sep. 13	SoCalGas settles criminal suit with $4 million payment (Walton, 2016).
Oct. 18	The IFT releases its final report, with some suggestions for natural gas storage nationwide (ITFNGSS, 2016).
Oct. 23	The one-year anniversary of the leak is commemorated with a protest and march to the gates of the Aliso Canyon facility, organized by SPR and FWW.
	As of one year after the leak, *LA Times* had published approximately 115 articles about the gas leak.

Over the course of the leak, which continued for over three months, a significant amount of data about air quality was collected by SCAQMD, CARB, and SoCalGas itself (see Figure 4.2). Few of the chemicals sampled, including benzene, a known carcinogen, were ever found in excess of environmental standards (AQMD, 2016; Monserrat, 2016).

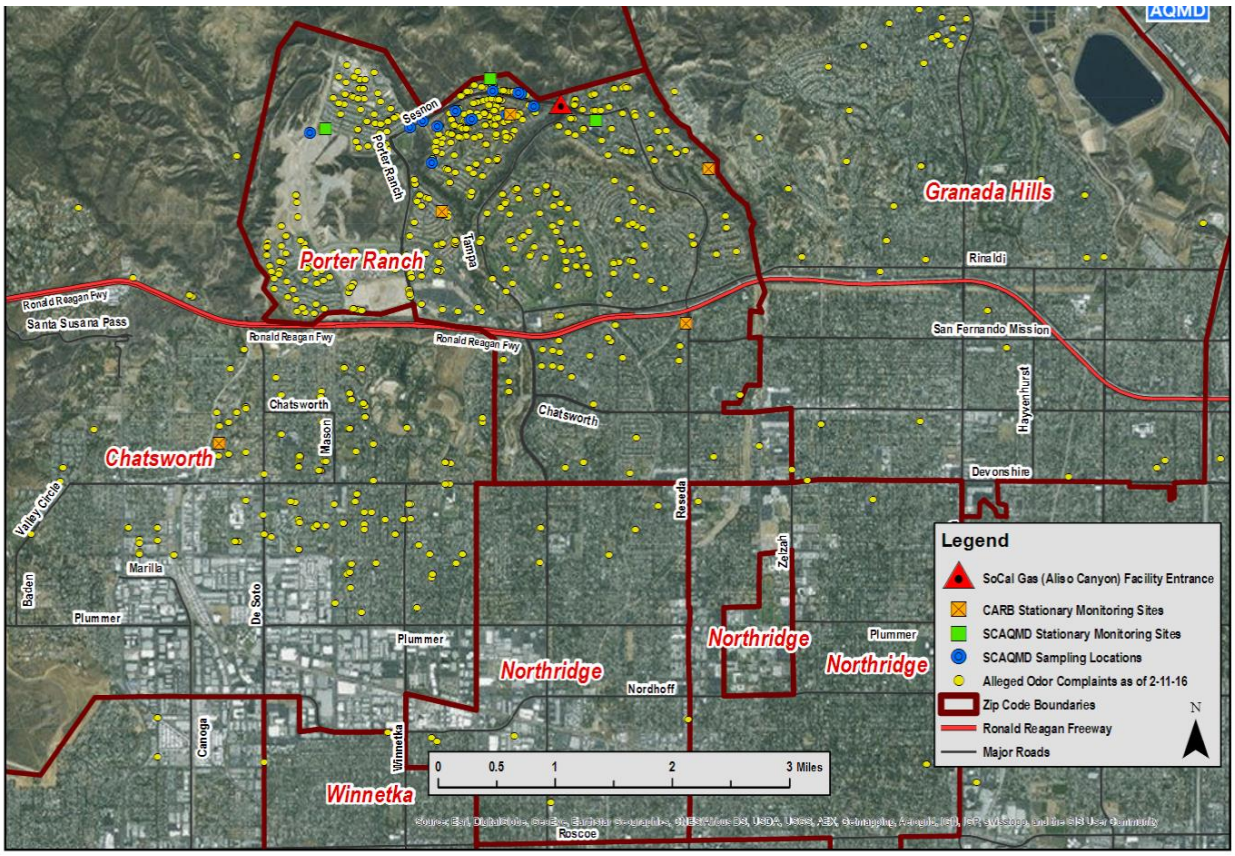

Figure 4.2. Map of air sampling sites for Aliso Canyon leak, publicly available from SCAQMD (SCAQMD, 2016).

Just shortly before this report was released, Governor Brown issued a state of emergency declaration, stating that the government of California will:

1. Take all viable actions to ensure that SoCalGas draws down gas levels in Aliso Canyon, captures leaking gases, and drafts more contingency plans;
2. Require SoCalGas to do a comprehensive review of the safety of all wells and the air quality in the area, to expand real-time monitoring of emissions in Porter Ranch, to establish an independent public health panel of scientific and medical experts, and ensure the continued reliability of electricity supplies in LA;
3. Ensure via CPUC that SoCalGas pays for the leak without passing costs on to ratepayers, and that they will develop a program to mitigate emissions;

4. Strengthen oversight via emergency regulations for gas storage operations in California, and require DOGGR, CPUC, and AQMD to prepare a report on the viability of natural gas storage in the state.

Outcomes

"Aliso Canyon was a wake-up call that revealed the disastrous consequences of not aggressively testing and monitoring our energy infrastructure"

State Senator Fran Pavley, representing Porter Ranch
Quoted on her website (Pavley, 2016)

In sum total, as of September 2016, SoCalGas has paid more than $700 million in costs related to the leak (Walton, 2016). By about one month after the leak was sealed in February 2016, the majority of residents had moved back in to their homes, but as of November 2016, not all residents have received reimbursements for their relocation. Public schools are back to normal; the relocation cost more than $5 million in total, but LAUSD expects to be compensated (Blume & Resmovits, 2016).

Much like Southeast LA, the housing market has been affected. The median house price in Porter Ranch is $670,000, but in the year after the gas leak, the number of home sales dropped, and the rate of price increase was much slower than comparable areas of the San Fernando Valley area of LA. For example, Calabasas and Hidden Hills saw the median home price rise 30% compared to just 5.7% in Porter Ranch (Khouri, 2016).

Air quality monitoring continues to be an issue. As government-organized sampling and testing slowed and then stopped, residents have struggled to keep their own, independent sampling stations open in order to hold SoCalGas accountable and to verify ongoing acceptability of air quality (Save Porter Ranch, n.d.).

There has also been a movement to close down the Aliso Canyon facility following the leak, spearheaded by SPR with support from FWW. The movement has supported by groups as far afield as New York (Steingraber, 2016). Such activism in the wake of any kind of industrial crisis is expected, but degree varies according to the community. Beck (1992) writes, "risk consciousness and activism are more likely to occur where the direct pressure to make a living has been relaxed or broken, that is, among the wealthier and more protected groups" (p. 53). Given the degree of separation between the community and the facility until the gas leak, perhaps this very compartmentalization contributed to the ultimate event. Had residents been more aware of the facility, they may have advocated for tighter regulations or more oversight. While there is evidence in the literature of successful local campaigns to hold facilities accountable (Bullard & Johnson, 2000; Lerner, 2010), the application to Porter Ranch is conjecture and there is no knowing whether their attempts would have prevented an eventual leak. Nonetheless it reiterates the importance of knowledge in counteracting vulnerability. Akin to the situation in Southeast LA, some residents were aware of some degree of hazard, but the extent was unclear until a focusing event brought it to attention.

In the following chapter, the outcomes of both the Aliso Canyon gas leak and Exide's HRA are analyzed as focusing events that drew public and governmental attention and catalyzed policy change. The degrees and mechanisms of these changes varied considerably, but the two cases illustrate a number of factors that set industrial health crises apart from other focusing events, and that can therefore shed light on theories of policy change.

I don't know but I've been told
SoCalGas has got to go
Stop the lies and stop the leaks
Shut it (all) down that's what we seek
Our leaders need to grow a spine
Our health is running out of time
- chant at One Year Later protest (personal observation)

Chapter Five

Identifying Patterns in Policy Responses to the Case Studies

The communities in Southeast LA and Porter Ranch were differently vulnerable to the pollution they found themselves subject to, and their respective histories and social power and positionality played a role in the origins of the Aliso Canyon and Exide crises. Fundamentally and empirically, industrial health crises are much more likely in certain communities compared to others (Lerner, 2010). The particular vulnerabilities of each community were discussed in depth in Chapters 3 and 4. In both cases, the residential and commercial facilities developed at approximately the same time and coevolved over decades, yet the two communities' demographics, resources, and positionality differed in many significant ways.

When each focusing event occurred, the responses varied widely. The case studies, as presented, can therefore offer insights into the characteristics of communities and events that shape the response of policy makers to industrial health crises, and thus, how such events act as focusing events. Although in many ways, both case studies are ongoing crises, the initial six month policy window that opened after the initial focusing event has long since closed. The longer-term implications may not be clear for some time. The following table (5.1) is a non-exhaustive list of strategies and actions taken by regulatory agencies, the Legislature, and the

Governor's office in one or both crises. Some are specific, stop-gap efforts (e.g. ordering the company to reduce emissions) while some indicate more systemic changes (e.g. changing emissions rules). Most are more opportunities for future policy improvements, rather than perfectly executed responses. A few actions were taken by both a public agency and by the company itself. For example, soon after the leak in Aliso started, SoCalGas set up a small booth by the facility entrance to talk to concerned residents.

Note that the majority of these changes are at the governmental learning level, i.e. they are at the scale of actions, rules, and processes to support a specific policy instrument, rather than changing the instrument itself or its underlying justification. For example, there was little evidence that agencies changed the overall structure of permitting as a mechanism for enforcement; rather, both executive and agency actors actively decided *against* significant changes to the permitting structure, and instead made specific changes that only applied to Exide or Aliso Canyon. One example of an instrument change was the establishment of the LA County Strike Team. Although it took more than a year to become active, the Team is a newly created entity that will use a mix of incentives, negotiations, and interagency collaborations to *prevent* industrial health crises. More details on it are not available yet, as it is in its infancy, but it has the potential to change the occurrence and outcomes of industrial health disasters. The effectiveness of the team has yet to be seen, but it represents successful lesson-drawing from Exide, and potentially even social learning about best practices for avoiding environmental health and justice issues.

Table 5.1 Actions by governmental entities in response to Exide Tech. and Aliso Canyon

	Type of action	Examples	Exide Tech*	Aliso Canyon*
State and Federal Regulatory Agencies	Negotiations with subject	Conduct negotiations about long-term permitting	x	
		Agree upon actions plans and/or contingent deals for emissions reductions	x	x
	Commands and orders to subject	Order company to conduct environmental testing	x	x
		Order company to host public meetings	x	x
		Order company to reduce emissions	x	x
		Order payment of fines and/or reimbursements	x	x
		Order company to suspend operations	x	x
	Changing rules	Change regulatory rules, e.g. reduce permissible emissions	x	
		Create new oversight and/or advisory bodies within agency	x	
	Engaging other policy entities	Involve higher power structures, e.g. Gov. Brown	o	x
		Create new oversight and/or advisory bodies between agencies	x	
	Legal actions	File legal petition for permanent closure	x	
		File legal petition for reimbursements	x	x
		Conduct criminal investigation	x	x
	Engaging with public	Choose whether or not to publicly disclose information	x	x
		Host or participate in public meetings	x	x
		Create internal task forces for community engagement	x	
		Offer free health testing and/or screenings	x	x
		Conduct air monitoring beyond routine sampling	x	x
		Offer indirectly related programs to benefit public (e.g. job training for environmental consultants)	x	
State Legislature	Publicity	Give public speeches and visits to sites	x	x
		Write open letters to other governmental entities	x	x
	Lawmaking	Pass new laws revising or establishing jurisdiction, regulations, or regulatory bodies	x	x
	Funding	Draft and edit state budget / introduce appropriations bills	x	
Office of the Governor	Publicity	Give public speeches, statements, and visits to sites	o	x
	Lawmaking	Sign or veto laws	x	x
		Choose between importantly distinct bill options	x	x
	Oversight	Oversee all regulatory agencies, which are part of Executive branch	o	o
	Executive orders	Declare State of Emergency, with attendant funding and other resources		x
	Funding	Draft and approve state budget	x	

*Note: x = fully occurred; o = partially occurred

Table 5.2 California laws regarding Exide Technologies and Aliso Canyon

Aliso Canyon

Number (Author)	Summary	Intro. Date	Status
SB 380 (Pavley)	Imposes an immediate moratorium on further natural gas injection or production of gas from aging Aliso Canyon wells until a determination of no public risk, and CPUC must determine feasibility of decommissioning Aliso.	2/24/15	Signed into law 5/10/16
SB 886 (Pavley)	Electricity: energy storage systems. The state must conduct an analysis of alternative by July 1, 2018 and those alternatives must be achieved by Dec 31, 2030.	1/20/16	08/11/16 Held in committee
SB 887 (Pavley)	Adds new inspection, safety, and disclosure rules for all 14 underground gas storage fields statewide, and increases safety standards of natural gas wells near schools and homes. Requires utilities to upgrade leak response and communications plans. Requires study of the long-term health impacts of community exposure to natural gas odorants.	2/24/15	Signed into law 9/26/16
SB 888 (Allen)	OES will coordinate response to future natural gas leaks. Requires a penalty assessed against a gas corporation after a natural gas storage facility leak to at least equal the amount necessary to fully offset the GHG climate impact. Relevant penalty moneys to Gas Storage Facility Leak Mitigation Account.	1/20/16	Signed into law 9/23/16
SB 1304 (Huff, with De León, Pavley, Runner)	Would authorize a county board of supervisors to provide for reassessment of property destroyed or damaged by a major misfortune or calamity, including environmental contamination, in an area or region subsequently proclaimed by the Governor to be in a state of emergency. Retroactively applies to Porter Ranch.	2/19/16	Passed 9/8/16; Vetoed 9/26/16
AB 2748 (Gatto)	Applies *only* to Aliso and Exide. Interim payment for an environmental disaster would not release polluter from liability for any related (future) claim. The statute of limitations for specified civil actions based upon exposure to a hazardous or toxic substance would increase from 2 to 3 years.	2/19/16	Passed 9/9/16; Vetoed 9/26/16
AB 1905 (Wilk)	The Natural Resources Agency, on or before July 1, 2017, must conduct an independent scientific study on natural gas injection and storage practices and facilities	2/11/16	05/27/16 Held in committee
AB 1903 (Wilk with Pavley)	This bill would require [OEHHA] to conduct a study on the long-term health impacts of the Aliso Canyon leak, paid for by SoCalGas.	2/11/16	08/11/16 Held in committee
AB 1902 (Wilk)	This bill would set a 3 year statute of limitations for commencing a civil action based on exposure to hazardous or toxic substance resulting from Aliso Canyon gas leak (see SB 2748).	2/11/16	04/05/16 Held in committee

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Exide Technologies

Number (Author)	Summary	Intro. Date	Status
SB 2748 (Gatto)	See entry under Aliso Canyon, above.		
SB 673 (Lara)	Requires DTSC by January 1, 2018, to establish or update permitting criteria for hazardous waste facilities, and to develop and implement, by July 1, 2018, programmatic reforms "designed to improve the protectiveness, timeliness, legal defensibility, and enforceability of the department's permitting program"	2/27/15	Signed into law 10/8/15
SB 93 (De León) AB 118 (Santiago)	Together, gives DTSC Account a loan of $176,600,000 for cleanup and investigation of lead-contaminated properties surrounding Exide, including job training activities, and actions taken to pursue all available remedies against potentially responsible parties.	1/9/15	Signed into law 4/20/16
AB 1329 (V. Manuel Pérez)	Requires DTSC to prioritize enforcement actions affecting communities that have been identified by the California Environmental Protection Agency as being the most impacted environmental justice communities.	2/22/13	Signed into law 10/5/13
AB 1330 (John A. Pérez)	Does same as AB 1329, and additionally facilitates public commentary for non-English speakers, raises cap for EJ Small Grant Program, would require CalEPA to maintain an agency-wide public database of certain information related to entities regulated by each board, department, and office of the agency. Many other provisions were excised in process.	2/22/13	Stalled as of 11/30/14

In the introduction of this thesis, I outlined four ways in which the results of this study of industrial health crises can inform our collective approach to understanding focusing events and their role in the policy process: recognizing the unique characteristics of industrial crises; looking at smaller scales of events and policy change; acknowledging the significant role of community organizing and public engagement in bringing policy change to fruition; and including a focus on justice. I argue that the patterns that arise from Exide and Aliso, both in the characteristics of the communities and facilities, as well as the regulatory responses to their crises, shed new light on the concept of focusing events and add nuance and deeper understanding the work of Kingdon, Birkland, and others.

Unique characteristics of industrial health crises

In prior literature on focusing events, the focus has been on clear-cut disasters, such as earthquakes and terrorist attacks, that are easily identified as focusing events. Most stakeholders can agree that they are disasters, which is not the case in industrial crises. There are two main threads that set industrial events apart from other crises in terms of their functionality as focusing events. The first is the human creation of risk and the unique impact on public health compared to other focusing events, and the second is the contestation in evaluating and responding to the hazard.

Human creation of risk

Industrial health crises are often characterized by a creeping risk that is less attention-grabbing than earthquakes or explosions, and thus can be harder to discover or turn into impetus for change. In the two case studies, and likely in many other cases, there is a degree of awareness of risk – smells from the facility, small accidents or leaks, existing regulatory actions – but little to no idea of the scope of the risk. Exide racked up numerous violations, not all related to lead, over the years, while a recent testimony in front of the State Senate revealed numerous small issues and evidence of deteriorating infrastructure at Aliso (Baker, 2014). The fact that warnings are ignored is intrinsic to the existence of the hazard. Aliso Canyon, while started by a single well "blowout," became a *much* more significant concern because of the accumulated risks and suffering entailed by the extent of the leak. Likewise, a single small lead or arsenic release is of minor concern; the reason Exide ever became a focusing event was because of the accumulated risk of years of illegally high emissions. In most industrial health crises, there may be a single focusing event that illustrates this risk, but the hazard exists and is worsened because of its longevity. This is integral to its role in policy change.

The dismissal of warning signs is not unique to industrial health crises. In the years leading up to Hurricane Katrina, a classic focusing event, there were numerous warnings about the frail, inadequate state of the levees protecting New Orleans. When the hurricane hit, it was the failure of the levees, rather than the strength of the storm itself, that caused its extreme and unequal impact (Hartman, 2006). However, this fact has thus far been mostly overlooked in literature about focusing events, and industrial health crises are particularly appropriate for illustrating its importance.

That being said, the warning signs in industrial events may be less apparent than other situations. Although the technology in industrial events is usually less complicated and more easily altered to address concerns than, for example, a nuclear power station, it is also less tightly regulated. Therefore, risks are often not identified as such until too late, or improvements are deferred due to the cost or hassle. In both Exide and Aliso, there was knowledge of a risk, whether from the inevitable aging wells at Aliso or from the ongoing issues with ineffective emissions control at Exide, but changes were put off until it was too late, and significant and sadly avoidable health impacts occurred. Pulido, Kohl, and Cotton write that Exide was "a spectacular case of inability/unwillingness to enforce the law" (2016, p.13) – the laws were in place, but they were unused. This raises two important points about the policy response to industrial health issues. The first is the consistent failure to identify or pursue violations in existing regulations, and the second is the inherent ineffectiveness of current enforcement mechanisms.

The first issue is the failure of regulatory agencies to identify or pursue violations. There are laws in place that regulate the chemicals of concern that Exide emitted, but emissions still almost routinely exceeded these regulations. This improper execution of laws and regulations

that are already in place is a complete failure of the company, of course, but of the agency as well. In a public forum at Pitzer College on Oct. 6, 2016, Senator De León stated that DTSC had suffered from corruption, laziness, and an inability to enforce existing laws adequately. While this may have been overstated for political reasons, there is no doubt that Exide and many other facilities are able to operate with a degree of disregard for environmental law. Many involved in the Exide case have angrily proclaimed that the facility was operating on an interim permit for decades, and for the first many months after the HRA report came out, DTSC was primarily trying to regularize Exide's basic permit. In these situations, it is not necessarily a policy change that needs to occur, but rather better enforcement of existing laws. In many cases, regulatory agencies lack the human-power, money, and equipment to continually monitor every facility and ensure complete compliance, so this is one soft approach to improving outcomes that does not require changing laws, but rather changing funding. That being said, in some cases this may be as difficult, if not more so, as changing laws themselves.

Even when regulatory agencies *do* identify and pursue punishment for violations, for many companies, this is a slap on the wrist rather than a motivation for systemic change. The cost of updating pollution controls can be tremendous, and fines are often on the order of a few thousand dollars, so companies often simply pay the fines and do little to improve emissions. The LA Times (Barboza, 2014) quoted Msgr. John Moretta of Resurrection Catholic Church of Boyle Heights, which was highly active in anti-Exide organizing, in response to the federal criminal investigation:

> Hopefully, this is another way to bring Exide to accountability… You have a company that has a whole list of violations and, year after year, they pay a fine and they are allowed to continue working.

Msgr. Moretta's statement illustrates the frustration of local residents with the regulatory process, which in their view essentially allows companies to pay to pollute.

Contestation

The second important aspect of industrial health crises is the degree to which they are contested, from their very existence to how to move forward. I revisit the concept of consensus and dissensus crises (Quarantelli and Dynes, 1977). In the former, everyone agrees on the existence of the crisis, appropriate norms and values, and general directions for solutions, whereas in the latter there are contrasting views on the nature, origin, and appropriate response to a situation. Given the inherently fluid and contested nature of industrial contamination, from quantifying pollution and associated risks, to epidemiologically supporting impacts, to assigning responsibility and determining the appropriate response, they manifest as dissensus crises. However, characteristics of consensus versus dissensus crises are partially dependent on scale. For example, while climate change is an international consensus crisis among scientists and international leaders, in the US political sphere, it has aspects of a conflict crisis, as a stubborn minority refuses to agree that it is anthropogenic or even that it exists at all, let alone agree on appropriate responses. In California at least, the unjust patterns of industrial pollution is a consensus crisis; many laws and policies have been enacted to address the general existence of environmental injustice. But each individual case is a conflict crisis, in which the particular risks and impacts are hotly contested by the affected community, epidemiologists, companies, government agencies, and other interested parties.

The most fundamental contestation in industrial health crises is identifying the existence, extent and severity of health impacts. There was significant evidence throughout both case studies of disagreements over impacts, often between companies trying to mitigate public fear and their own liability, and residents concerned about their homes and families. As I detailed in the introduction, this is a common aspect of such crises (Brown et al., 2012; Lerner, 2010). In

addition to overt impacts such as bloody noses and elevated blood lead levels, residents may also suffer psychosocial impacts (Bertazzi, 1989) that are nearly impossible to "scientifically" prove.

These disagreements are also not just based on the opposing interests of the parties, but also accessibility of information about the situation and ability to interpret it (see p. 79). Governmental agencies usually fall somewhere in-between, beholden to some degree of political considerations while also trying to protect public health and the environment. The following three subsections address three other ways in which industrial health crises may be contested, often rooted in the competing interests of the stakeholders: economic concerns, sustainability and "greenwashing," and long term visions for solving the crisis.

Economic considerations and the prospect of job creation may tip the scales in a community to favor the construction or expansion of a potentially hazardous industrial site. Industry developers often claim that their facilities provide solid, blue-collar jobs and other, generally unspecified "economic benefits" to working-class communities, a positive aspect of industrial activity. But this economic value comes at a cost, especially when workers are exposed to hazards within the workplace. In Aliso Canyon, workers attempting to close the leak were primarily exposed to elevated levels of natural gas, mercaptans, and associated hydrocarbons including potentially benzene, as well as risks of explosion from the efforts to seal the leak. In Exide, the original Health Risk Assessment report indicated cancer risks for on-site workers of 440 cases in a million.

The jobs are also used as leverage when communities organize to clean up or shut down a facility, because if the facility goes away, so do the jobs. A previous study on the aftermath of the 2010 Deepwater Horizon oil spill in the Gulf of Mexico found that residents in counties that were highly dependent on the offshore drilling industry had a more pro-drilling attitude after the

spill, although not before (Bishop, 2014). The event itself highlighted the economic importance of the risky activity. In Southeast LA, Exide workers worried about losing their jobs spoke at community meetings in favor of the company, as quoted in the *LA Times* (Garrison, 2013):

> 'Stop trying to destroy our family,' one worker's wife, Sandra Gutierrez, told the crowd. 'Let's stop trying to blame everything on Exide.'

In fact, over 120 workers were laid off from the facility when it closed in March 2015. They much preferred improved pollution controls rather than complete closure, while other residents who were not economically dependent favored closure. Some SoCalGas employees do live in Porter Ranch, but there has been less evidence on their experiences (SoCalGas, 2016).

The second broad area of contestation relates to environmental concerns and the use of environmental rhetoric and framing to shift the debate. Pellow (1998) writes about about some of these dynamics in the context of municipal recycling facilities. The rich irony of Exide's function as a lead battery recycler is a perfect illustration of the complexity of many environmental issues. Exide collects used batteries, otherwise destined for a toxic waste site, and regenerates something useful from them. It reduces the amount of new material that has to be mined, and manufactures batteries that are integral to the reliability of renewable power sources like solar and wind. Exide officials took advantage of these facts, and used sustainability rhetoric to support their point of view, including stating that closure of the facility was a loss of "green" jobs (Kim, 2014). While they are not wrong, per se, such "greenwashing" ignores the nuance in environmental safety and steps around their irresponsible behavior regarding emissions, as well as worker safety within those jobs.

Although it affected Aliso Canyon in a totally different way, sustainability and environmental concerns also influenced the response to events there. The gas leak had threefold impact: immediate health impacts on residents in the area; meso-term concerns about energy

security in the Los Angeles area; and long term implications for state and national greenhouse gas emissions. While the important synchronicity between the three concerns will be covered in a later section, with regard to sustainability, natural gas is often touted as a cleaner, "greener" alternative to other fossil fuels. Especially with the boom in fracking, natural gas is becoming increasingly common as a cheap, greenwashed source of energy.

The final area of contestation seen in these two case studies was over the future of the facility. The long term plans of the stakeholders involved in industrial crises are often in stark opposition: The companies that operate the facility wish to get them reopened as quickly as possible, while residents often want complete shutdown. The two topics above, sustainability and jobs, may be used as wedges on either side of this debate. Aliso had a third wedge, so to speak, the threat to Los Angeles's energy security in the event of continued closure during the hot summer. Residents felt that that SoCalGas and regulatory agencies were engaging in "blackout blackmail," threatening that the closure of the facility would cause widespread power outages in the peak of summer in LA. So residents found independent analyses and reports that they felt demonstrated the complete opposite: that LA did not even need the storage facility (observed in public rally and protest march, Oct. 23, 2016). I have not been able to independently verify the veracity of either side's position, but it illustrates the way the same issue can be viewed and described very differently by groups with different perspectives and agendas.

In short, both the anthropogenic development of the crisis and in its degree of contestation set industrial health events apart from other focusing events in existing literature. It suggests that future work on focusing events should take into account the inherently subjective nature of defining and addressing crises, and that policy outcomes may sometimes be most impactful by simply holding current structures to higher account.

Scale of events

The existing literature has focused on the federal level of problem and response. But there are a few issues with this approach. The first is that industrial health crises are nearly always on the surface a local problem, with a commensurately scaled response. I write "on the surface" with intention: Kurtz (2003) points out that scaling is another contested area in such issues, where the inherent spatial ambiguity can lead to broadening or narrowing of the scale of the issue, to include or exclude wider social and geographic patterns. Environmental justice activists and scholars have rejected narrowing and strictly localizing of these issues, rightly pointing out that they are part of larger institutions and power structures (Kurtz, 2003). An inherent conflict exists in this balance, because as I have written, the origins and solutions to such problems cannot be understood outside the specific context of the communities in which they exist. Kurtz writes, "The significance of scale is expressed alternatively…as an analytical spatial category, as scales of regulation, as territorial framework(s) for cultural legitimacy, and as a means of inclusion, exclusion and legitimation" (p. 887). In many industrial health events, the appropriate scale acknowledges and engages with the issues of inclusion, legitimacy, and wider social patterns, while focusing on the salient characteristics of the local. In these two case studies in particular, scale is expressed as a spatial category, to understand unique aspects of the affected communities and their particular vulnerabilities, and through scales of regulation, to understand how the crises took place and the mechanisms of response.

With that in mind, the fact that most literature has looked at focusing events at the federal scale ignores communities' experiences. In writing about community vulnerability in the face of climate change, Parkins and MacKendrick (2007) point out that, much like the literature on focusing events, the literature on the impacts of climate change is focused on large, short-term,

extreme events like hurricanes and floods. However, climate change, like industrial health crises, has impacts at a slower pace and on much smaller scales. It is at these scales that vulnerability must be assessed, linking community conditions to specific policy recommendations and actions, because vulnerability to such events is intrinsic to a community (Cutter, Boruff, & Shirley, 2003; Parkins & MacKendrick, 2007), as illustrated through the narratives of these two case studies.

The other reason is that individual affected communities have the greatest leverage at the city or county level, particularly in a highly populous state like California, because they have better access to local or, to a lesser degree, state representatives, as opposed to national representatives. Furthermore, although the federal government has more funding, it often has less dexterity and speed in its responses, because it is constrained by the Constitutional restrictions on federal jurisdiction, less familiarity with the particulars of a given situation, and a crushing load of issues to address.

That being said, the pace of change is very slow at every level, from local regulatory agencies to state legislature. In Exide's case, DTSC took months to establish the blood testing program and even longer to actually start blood testing, and they took months to get results on residential lead testing despite using an instrument which "instantaneously" reads lead content in soil. Even at the local level, where accountability should be higher, agencies take an exhaustingly long time to get anything done. Part of this is, in a sense, necessary: as the cleanup process began, residents debated whether to apply for a waiver for the usually required Environmental Impact Report (EIR), in order to start cleanup as soon as possible. But many were concerned that without proper planning and consideration, the cleaning would worsen the existing situation and cause new problems. So it was decided to go ahead with the EIR, leaving many residents bitter and upset that they are living in extremely contaminated homes.

In the state legislature, it takes months to pass laws, if they are passed at all. Many bills are introduced but languish as other issues take precedence. In response to Exide, at least seven bills were introduced, and four ultimately became law. In response to Aliso, at least nine bills were introduced, and three ultimately became law. Many fell by the wayside in various committees, and in both cases, at least one was vetoed by the Governor.

Furthermore, while the policy response at the local level may be strong and address the individual problem, for example, the final closure of Exide's facility in Vernon, the inherently local nature of the issue often prevents the more comprehensive reform that many EJ activists would prefer. In fact, a pattern in the two case studies was that policy makers, in particular non-agency actors, chose smaller-scope solutions rather than enacting more substantive changes. In response to Exide, in 2014 the California Senate and Assembly passed two bills, SB 712 and SB 812. Both would have regularized Exide's permit situation, but the former had specific requirements that meant it effectively applied to only Exide, while the latter had substantive changes in the permitting process that would have affected Exide among other facilities, and included a requirement for permit renewal every five years. When the two came before Governor Brown, he signed the more narrowly targeted SB 712. In another case, Rep. Gatto introduced AB 2748 in February 2016, which would have provided certain forms of relief including an extended statute of limitations and affirmation of corporate liability for *specifically* people affected by Aliso Canyon and Exide. Although it was vetoed by Gov. Brown, it similarly illustrates the tendency to target changes to the specific case at hand rather than preparing for future situations.

The exception to this pattern is cases in which communities can effectively broaden the scope of their issue to include other campaigns and/or communities, as with Porter Ranch, which provides them leverage for a greater scope of change. A number of local initiatives and state

legislative bills have been implemented in response to Aliso Canyon. Some were specific to Aliso Canyon, like the legislative moratorium on injections (SB 380), ongoing as of November 2016. Another is SB 887, which requires new inspections and safety standards for underground gas storage. Many storage facilities are remote from populated areas, so the bill primarily affects the risks of further greenhouse gas emissions rather than public health implications. In fact, of the three bills passed in the wake of Aliso Canyon, all three reference or are entirely focused on GHG emissions reductions and mitigation, and two bills that the Governor vetoed, despite support from the State House and Senate, related more to public health and Aliso Canyon specifically. This idea of linked issues and the effect of community organizing in response to the crisis bring us to the next key finding from the two case studies, community engagement.

Community activism

The importance of community organizing in changing the outcomes of these two cases cannot be overstated. As illustrated throughout the case studies, organizing plays a tremendous role in keeping issues in the news, in policymakers' minds, and on track to positive progress.

The first influence is in simply putting and keeping an issue on the agenda. In all stages, community organizing holds agencies and elected officials accountable to constituents' needs. Much of this comes at the agency level, such as changes in agency rules or priorities, rather than changes in underlying laws. For example, the Exide Advisory Group was convened at least in part to be able to gather feedback and opinions from community members, a responsibility that DTSC is taking very seriously (personal communication, Cesar Campos, Public Participation Supervisor for DTSC). This is a physical space in which agency representatives and community members can confront the challenges of the cleanup process, and residents do confront. At an

Oct. 20 meeting, many spoke angrily about their experiences and one brought up the evacuation in Porter Ranch as a point of contrast. Thus, organizing keeps agencies aware and responsive to communities. Of course, that does not mean that the funding, pace, and thoroughness of agency efforts and actions were not always adequate. Nonetheless, community organizing pushes issues onto the agenda and can successfully move beyond that to policy change.

The second influence of community organizing relates to the ultimate changes that occur: the demands of communities become policy alternatives. For example, although policy makers would likely never have planned to close Aliso Canyon, Porter Ranch residents have joined with anti-fossil fuel activists from around LA and the country, and have an ongoing campaign to #shutitALLdown. Their desires have added an entirely new option to the suite of responses to the leak, and their continued activism pushes policy makers to seriously consider it. In fact, regardless of where the communities started from, both Porter Ranch and Southeast LA were successful in demanding temporary closure of the facilities and cleanup of nearby homes. Exide was permanently shut down, while the ultimate fate of Aliso Canyon is still uncertain.

The third way in which community activism was critical to amplifying the effects of the core focusing event was in linking multiple issues together. Particularly in Aliso Canyon, connecting issues was a key component to building support and pressure for change. For Aliso, the implications for public health, local fuel supplies, and greenhouse gas emissions pulled three entirely different groups into the dialogue. Porter Ranch had a far shorter history of organizing than Southeast LA, but SPR's pre-existing partnership with Food and Water Watch, in part an anti-fracking organization, was integral to post-leak organizing, uniting affected residents who had previously not been involved, and the anti-oil and gas and climate change activist communities. Local activists connected the leak in their neighborhood to the larger public health

issues of fossil fuel extraction and use; to activism in other areas of LA, the state, and as far away as New York (Steingraber, 2016); to the anti-fracking movement; to the larger issues of climate change and a sustainable future and to the need for "green" jobs like solar. In protests I observed, connecting individual health to the health and longevity of the planet was a key part of their rhetoric and a rallying cry. The environmental component did not at all overshadow the public and individual health concerns of residents, but rather helped bolster the communities' demands for a complete shutdown, and helped widen the concerned public from just nearby residents to activists all over the greater LA area and the country who could sympathize with the message of "dirty oil."

A recent story from rural Alabama highlights the importance of linking issues as well as the role of community vulnerability in eliciting a policy response: Eight Mile, a small town with predominantly black, low-income residents, suffered a 500 pound leak of mercaptans after an underground pipeline was hit by lighting. Mercaptans are the odorous chemical blamed for symptoms at Aliso, but residents in Eight Mile have not been moved, tested, treated, or compensated, despite myriad medical symptoms (Penn, 2016). Ironically – or perhaps not – the facility was purchased by the same company as SoCalGas, Sempra Energy, shortly after the leak took place. Carletta Davis, a resident of Eight Mile, stated: "Because we don't have the financial wherewithal to put pressure on these people, they simply turn their heads," (Penn, 2016). Beyond the financial wherewithal, the residents also do not have the same kind of organizing appeal for people that are invested in phasing out fossil fuel use, because the leak was not *directly* tied to a fossil-fuel facility. Of course, the stored mercaptans were likely intended to odorize natural gas, but in some ways it is less appealing to protest the middlemen than the face of the operation.

The final form of influence of community organizing was synchronicity of events. While the tripartite impacts in Aliso Canyon (public health, greenhouse gas emissions, and regional energy security) helped fuel its success in building a wide base of support and eliciting governmental responses, this was based on synchronicity of goals between related organizations. Protests in Porter Ranch were also fueled by other, unfortunately timed events in the Aliso Canyon facility, including small fires which added credibility to claims of its inherent hazards.

More powerful was the synchronicity between Aliso and Exide. The prompt, strong response to Aliso Canyon helped provide leverage for Southeast LA residents to push for the same in their area. Many saw the Governor's visit to Porter Ranch two months after the leak began, when as of three and a half years later he has not visited Vernon, as a powerful symbol of inequality between the two events and their differential treatments. Kingdon (1992) writes that any mechanisms by which problems enter the policy agenda, including focusing events, can be heightened or subdued by political considerations and attention from the "visible" cohort of policy participants, such as politicians, high-level administrators, and the media. Indeed, the media (see p. 84 for more on the media) used the comparison between Exide and Porter Ranch many times (LA Times Editorial Staff, 2016a; Martinez, 2016), and given that many of the same agencies are involved in both, such synchronicity places a unique pressure and accountability on all involved parties.

Incorporating social justice

The entirety of these case studies illustrate the importance of considering social justice in understanding the influence of focusing events. Industrial health crises occur most often in low-income communities of color, and the outcomes are dependent on what communities are affected

and the resources they can leverage to push for change. Those most affected are often the least able to take advantage of the opportunity presented by a potential focusing event, as they are politically, socially, and economically marginalized. They are not seen as important political constituents, even if they do express concern, which dramatically affects their ability to act as a concerned public and put pressure on public officials to act. These factors suggest the necessity of taking larger structural issues in society into account.

Incorporating concepts of environmental and social justice into the theory of focusing events is clearly important to better understand the processes of policy change. In practice, this is somewhat nebulous; the approach I take is to incorporate the relative power and social positionalities of stakeholders in each case study – and here, the temporal and geographical closeness *between* the two cases – into the process of analysis. In the following subsections, I explore six facets of EJ that arose from these two specific cases: barriers to understanding and knowledge risk, institutional trust and agency complicity, municipal divisions and unincorporated areas, corporate bankruptcy, media coverage, and white privilege. The first three facets relate to the creation of an industrial health crisis, the next two relate to the outcomes of a focusing event, and the final one bridges both. Some of these facets have been identified as contributors to community activism (Lubell, Vedlitz, Zahran, & Alston, 2006), and many have long been identified in environmental justice literature, as detailed in each section. Thus I focus on ways in which they can contribute to an improved understanding of focusing events.

Barriers to understanding and knowledge risk

The literature amply demonstrates the role of the social construction of risk in responses to environmental contamination (Bickerstaff & Walker, 2001; Brown et al., 2012; Elliott et al., 1999). Different facilities have differently socially understood risks, influenced by multiple

layers of community characteristics. Firstly, some facilities are inherently viewed as more dangerous regardless of the actual risks involved. For example, facilities that produce strong smells, smoke, or other perceivable indicators of emissions may be considered more dangerous (Wakefield et al., 2001).

Second is the ability to understand information about a risk. Both communities are home to many immigrants, which can pose a fundamental challenge from language barriers. The proportion of immigrants is higher in Southeast LA, where the non-English language spoken is almost uniformly Spanish. DTSC and other agencies made a concerted effort to provide translations of all written materials and live translations during meetings, which is a step in the right direction. Nonetheless, in both case studies, the nature of the issues invited the use of technical language that is very difficult for non-experts to understand and engage with. This is more important in Southeast LA, where educational attainment is lower.

Furthermore, when it comes to the highly technical jargon used in many industrial health crises, even people with high educational attainment may be at a loss. This language does serve a purpose for those who can understand it, but it also alienates and excludes many other stakeholders. Brown et al. (2012) write of the "scientization" of decision-making processes, in which quantitative, "objective" information is prioritized over the experiences of affected individuals. One Porter Ranch resident said, "If we don't have facts, we're just emotional" (personal observations, One Year Later protest). While facts may appear to provide an objective perspective on risks and appropriate responses, it also means that "debates regarding the costs, benefits, and potential health and societal risks of new technologies and industrial production may be dominated by experts…and divorced from their socioeconomic and political contexts" (Brown et al., 2012).

These processes can be seen in both Aliso and Exide. For example, while SoCalGas reported that there would be no long-term health effects from the gas leak, many residents felt that they had been irrevocably affected physically and emotionally. However, it would be functionally impossible for them to generate scientifically rigorous epidemiological evidence to support their experiences, because there were too few people affected and there is not enough existing literature on the impacts of an event such as the Aliso Canyon leak. In a similar way, blood lead tests were provided for residents near Exide in Vernon, but these tests only show lead exposure in the past six months – not years of living near a facility that may have routinely been emitting illegal quantities of the toxic chemical. These questions are both difficult to evaluate scientifically, and provide barriers to residents' claims of impacts. For those reasons, among other complex and specific reasons, though, both communities remained relatively unaware of the potential hazards they were facing, and thus, more vulnerable to contamination *and* to the single revelation that is characteristic of focusing events.

Institutional trust and agency complicity

The degree of trust in institutions – both government and business – can affect how the public experiences risks and responds to industrial health issues (Flynn, Slovic, & Mertz, 1993; Hudson, 2006; Metlay, 1999). Given the lack of trust in DTSC, residents in Southeast LA were more likely to immediately respond to any evidence of a danger, because they had little faith that DTSC would address it or perhaps even accurately represent it. On the flip side, this suggests that crises like Aliso, where the facility was generally perceived as safe if thought about at all, are more surprising and therefore more effective as focusing events. In both cases, residents felt that they were not getting complete or honest answers about what was happening, and this likely gradually eroded their trust in the capacity of the government to appropriately take care of the

crisis. It may have spurred residents to deepen their own involvement. While outside the scope of this thesis, further qualitative research would elucidate how trust in regulatory agencies to take care of potential risks can contribute to the creation of industrial health crises.

Regarding outcomes, evidence from after the focusing events, at least in Exide's, suggests that institutional trust can have a significant impact. When Gov. Brown approved $176.6 million in funding for the cleanup, he suggested exempting the funds from the normal CEQA environmental review process (see p. 41). Although there was debate within the community, the fear that DTSC would fail to do a safe, adequate job without an agreed and approved plan ultimately meant that the cleanup process was *not* exempted (LA Times Editorial Staff, 2016b). This means that residents have to wait until the CEQA process is finished, estimated at mid-2017 to get their homes cleaned. This includes residents who are living in literally toxic dirt.

This vignette and the idea of institutional trust also brings up the idea of agency complicity. In the case of Exide, I already wrote about the ways in which agency decisions, whether intentionally or not, precluded residents from obtaining resources or outcomes that they needed and desired. Regulatory bodies must balance a tremendous number of considerations, often with directly opposing implications. But they are the ones that levy fines, that decide where to pursue violations, that decided whether or not to allow criminal cases to be filed. Criminal charges against Exide are now prohibited, while they have already been filed against SoCalGas (St. John & Walton, 2016). Higher state authorities have chosen to not prosecute agency employees. The role of the companies themselves in influencing agency and higher-level decisions – often referred to as agency capture by corporate interests (Singleton, 2000) – is opaque, but this possibility hints at agencies diverted from their intended purpose, a betrayal of

the trust that residents may (or eventually may *not*) have placed in them to protect their health and wellbeing. Thus, understanding both community trust in institutions and the ways in which agencies are complicit, intentionally or not, with environmental harm, are crucial to unpacking community demands and ultimately, the policy choices that are made in response to industrial health crises.

Municipal divisions and unincorporated areas

Heaney et al. (2011) write that "low-income communities of color straddling rural-urban unincorporated boundaries of municipalities across the U.S. often fall within extraterritorial jurisdiction, joint-planning agreement, or industrial zoning designations that tend to concentrate locally unwanted land uses and psychosocial stressors and limit access to health-promoting infrastructure." While not exactly the case with Southeast LA, which is a mix of unincorporated, small city, and City of Los Angeles itself, the same pattern holds because of Vernon's separate incorporation. Vernon has nearly unique autonomy to tax and regulate – or not – the facilities within its borders. It has its own funding and close to no public accountability, as residents that live literally across the street but not technically residents have no standing with the Vernon government. This is exacerbated by the fact that residents in all three incorporation statuses are mostly low-income people of color, and that their city (or county) governments do not have the capacity to pursue action. Those within LA may be able to vote for City Council, but face a city government preoccupied with hundreds of other issues and millions of other residents. Those in unincorporated areas have the least influence, as they cannot even draw on the resources of a specific city, but rather have to plead to the county.

Corporate bankruptcy

A long, unfortunate tradition in environmental cases is the closure of companies responsible for environmental damage before they can be held liable for cleanup (Plater et al., 2016). If the original company is dissolved or enters bankruptcy, the individual stockholders, executives, and contractors can walk away with massive profits, while the technically responsible entity no longer exists for residents to sue or obtain reparations. On the other hand, the purpose of bankruptcy negotiations is to allow the company to continue to be viable, an outcome that facilitates ongoing financial liability for such companies. A few months after information about Exide's Vernon facility started emerging, Exide Technologies Inc. declared bankruptcy, stated to be unrelated to the Vernon plant (Cornell, 2013). It was not for the first time Exide had declared bankruptcy. Regardless of the reasons for doing so, the importance of corporate bankruptcy proceedings is in its impact on the policy outcomes of industrial health events. Bankruptcy negotiations added an additional layer of complexity to all regulatory actions and legal suits, including the attempts of regulators to obtain funds settled upon in a previous agreement ($38.6 million for closure and cleanup of the facility, and $9 million for the cleanup of nearby homes (Barboza, 2015a)).

Media coverage

Media coverage can play a tremendous role in the outcomes of public issues, and its role in the policy process has been amply explored elsewhere (Birkland & Lawrence, 2009; Cook et al., 1983; Holder & Treno, 1997; Shanahan et al., 2008). In general, the patterns in media coverage noted throughout Chapters 3 and 4 align with current theory on the impact of media coverage on policy change, including its ability to amplify attention for an issue and its critical role in how issues are framed, and thus it will not be discussed in much depth here. I wish only to

note that, in these cases, both received extensive local news coverage from small news organizations, local public radio, and the *LA Times*; Aliso received notable national news coverage. The comparisons between the two events, which point out disparities in responses, were particularly potent and are characteristic of media's desire for "conflict and competition" (Baumgartner & Jones, 2009). The imperative to sell news prompts a need for new stories (Baumgartner & Jones, 2009), so the ongoing nature of events related to Aliso and Exide actually benefitted Porter Ranch and Southeast LA. The continuous twists on the story and new updates to be reported. These two aspects of media coverage relate directly to the role of industrial health crises as focusing events.

White privilege

Before concluding this section on justice, I must re-engage with Pulido's (2000) work on white privilege and environmental racism. The genesis of this thesis was the comparison between the responses to Exide and Aliso Canyon, many of which focused on the demographics of the two communities and the much more rapid, resourced response to the latter crisis. Although Porter Ranch has a significant Asian population (27%), its population is predominantly white, in contrast to the less than 5% white population affected by Vernon. White privilege in visible in multiple layers of these stories.

The first is one Pulido focuses on, housing access and residential segregation. Southeast LA's histories, a little different for each small town in the area, nonetheless illustrate processes of "minority move-in" and white flight. It is a densely, densely populated urban core with massive industrial infrastructure. Some of its towns started as white-only and slowly became predominantly people of color, like Huntington Park, whereas others started more diverse and slowly lost their white residents, like Boyle Heights and East LA. These white residents moved

to places like Porter Ranch, where the median home price is nearly twice the median home price in Boyle Heights ($731,600 versus $390,500). In the one year anniversary protest, residents of Porter Ranch lamented the fact that they had moved to Porter Ranch to get away from the hustle and bustle of the city, the industry and the smog (personal observations), fitting Pulido's commentary on well-to-do whites buying the privilege of a cleaner environment. Residents in Southeast LA constantly face poor air quality and strong smells, which although not exactly the same are nonetheless analogous to the air quality issues in Porter Ranch, and *in addition* they face contamination from a known neurotoxin that affects childhood development, with lifelong effects. Only this second one has received significant policy attention, despite the inherent wrongness of the first as well.

The fact of the matter is that *no* community should be subjected to any kind of industrial health crisis. Both of these cases resulted from negligence, perhaps even gross negligence, on the parts of the companies and agencies that were involved in managing the facilities, and both were preventable. Every human has the right to a clean, safe environment in which to live, work, and play, and the issues of disproportionate access and exposure extend far beyond these two case studies, beyond even industrial emissions and contamination, to the very spatiality of American cities. Sources of pollution and environmental harms still exist, residential segregation still exists, white privilege still exists, and so injustice still exists. All scales of government use the rhetoric of environmental justice without actually achieving it, because the vast majority of the time, responses to crises like Exide and Aliso ignore the history and larger social patterns that led to them in the first place. This is the final lesson of including justice in analyses of focusing events. There is no way to understand focusing events outside the context that creates them,

especially in the case of industrial health crises. Thus linking local situations and outcomes to broader patterns adds another crucial layer to our understanding of focusing events.

Concluding comments

Industrial health crises act as modulated focusing events, in which a brewing public-health issue is discovered nearly simultaneously by policy makers and the public, highlighting deeply-rooted issues with existing policy such as fundamentally inadequate regulation or enforcement. These events often do not end without significant intervention from public agencies and community movements to pressure policy makers and responsible parties. Even then, the effects may linger on, like lead in the soil. The four factors that arise from this study – the uniqueness of industrial crises, the scale of analysis, the role of community activism, and a focus on justice – add nuance to the scholarly understanding of focusing events and provide a starting point for further research into the processes of policy change. They do not just reflect how industrial health crises can act as focusing events to catalyze policy change; they reflect patterns in other aspects of the policy process, from all types of focusing events, to problem identification and agenda setting, to institutional learning, and countless other areas of public policy.

I selected the two case studies in this thesis for the many parallels and contrasts that they have, and the unique ideas that can be drawn out of such a comparison. However, there are, sadly, numerous other industrial health crises that would add greatly to this analysis. An infamous one from just the past few years is the Flint, Michigan water crisis, in which changes in the city water supply and gross negligence by city and state officials led to extensive, devastating lead contamination in the municipal water supplies. Although the contamination was hinted at as early as April 2014 and became national news in March 2015 (Robbins, 2016), as of December

2016, many residents *still* do not have potable water. This case study even more clearly illustrates the importance of governmental and political accountability and agencies' complicity in the propagation of environmental harms. The scope of this thesis did not permit me to include any other case studies, but they are a powerful opportunity for further research. Further down the line, this work could expand beyond industrial health crises to look at other potential classes of focusing event, like investigative journalism, international events, viral social media content, or even political elections themselves.

As of now, there is little question that problems like Exide and Aliso will continue to exist. Despite the US's increasing move to the service sector, there is a strong core of manufacturing, processing, and industrial work that will continue to pose environmental and public health risks to nearby communities. New facilities will likely be placed in low-income communities of color, as they have been for decades; cycles of disaster, inadequate reform, and disaster will continue. However, a better understanding of the factors that influence policy change will hopefully allow communities to capitalize on these patterns to enact deeper transformations and more lasting safety.

"The reign of toxic lead ends today… After more than nine decades of ongoing lead contamination in the city of Vernon, neighborhoods can now start to breathe easier."

Acting U.S. Atty. Stephanie Yonekura,
Quoted in the LA Times upon the closure of Exide's Vernon facility (Barboza, 2015a)

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