Porous Lands and Bodies: The Scientific, Political, and Subject Formations of Toxicity in Bayview-Hunters Point, San Francisco

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Introduction

In 2021, a study examining Americans' breast milk showed that current-use and phased-out Per- and Polyfluoroalkyl Substances (PFAS) were found in 100% of samples tested, at levels that were approximately 2,000 times higher than what is recommended for drinking water.[1] The study refuted the chemical industry's claims that PFASs would not accumulate in people, and suggested that the the number of PFASs in breast milk would double every four years in the global population. The chemical has been shown to cause cancers, liver disease, thyroid disease, reproductive issues, and a host of other immune impacts.[2] PFAS are a part of a group of chemicals recently termed "forever chemicals," alongside chemicals like Polychlorinated biphenyls (PCBs), because they do not break down under typical environmental conditions such as in soil, water, or the body.[3]

The fact that these industrial chemicals have been shown to be disruptive to cycles of biological and social reproduction, suggests a pressing need to build new relations with these molecules—molecules that are integrating with our corporeal and environmental bodies whether

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[1] Guomao Zheng et al., "Per- and Polyfluoroalkyl Substances (PFAS) in Breast Milk: Concerning Trends for Current-Use Pfas," *Environmental Science &Amp; Technology* 55, no. 11 (May 13, 2021): pp. 7510, https://doi.org/10.1021/acs.est.0c06978.

[2] "Protecting against 'Forever Chemicals'." Harvard T.H. Chan, March 16, 2023. https://www.hsph.harvard.edu/news/hsph-in-the-news/protecting-against-forever-chemicals/.

[3] Giorgia Guglielmi. "How to Destroy 'Forever Chemicals': Cheap Method Breaks down Pfas." Nature. Nature Publishing Group, August 18, 2022. https://www.nature.com/articles/d41586-022-02247-0#:~:text=Dubbed%20%27forever%20chemicals%27%20because%20they,the%20human%20body%20once%20ingested.

we like it or not. In our very own Berkshire County, where Williams College is located, the Housatonic River and the city of Pittsfield are deeply contaminated with an estimated 1.3 million pounds of PCBs due to Pittsfield's former General Electric (GE) Company plant, which is now considered a Superfund site.[4] The GE plant manufactured transformers from 1929 to 1979, which used PCBs in the manufacturing process, despite having known about the dangers of PCBs since 1937.[5] In order to get rid of the contaminated soil containing PCBs and a host of other industrial chemicals, GE buried the contaminated soil in Unkamet Brook, Silver Lake, and then directly in the city, including in workers' yards, city parks, and schoolyards.[6] In the present day, the EPA declares that there is human risk from direct contact with floodplain soil, consumption of fish and waterfowl from the site, and consumption of agricultural products grown in floodplains or in contaminated soil; moreover, there remains an increased mortality to benthic invertebrates, larval fish, frogs, minks, osprey, and bald eagles, with the EPA stating that their studies "demonstrated conclusively that the many species of aquatic life and wildlife in the Housatonic River ecosystem are experiencing intermediate to high risk as a result of exposure to PCBs in both the river and floodplain… similar risks extend to species beyond those specifically evaluated."[7]

Learning about the GE case and thinking about the new chemical relations that I entered into during my undergraduate studies at Williams College, made me interested in the integration (or lack thereof) between social and chemical relations. This inspired me to learn about how

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[4] Clara Chaisson. "After 40 Years, Will Ge Get a Pass for Polluting the Housatonic River?" Natural Resources Defense Council, August 28, 2017. https://www.nrdc.org/stories/after-40-years-will-ge-get-pass-polluting-housatonic-river.

[5] "Some Background on the GE and PCB Issue." Berkshire Environmental Action Team. Berkshire Environmental Action Team, October 29, 2016. https://www.thebeatnews.org/BeatTeam/some-background-on-the-ge-and-pcb-issue/

[6] "Some Background on the GE and PCB Issue." Berkshire Environmental Action Team. Berkshire Environmental Action Team, October 29, 2016. https://www.thebeatnews.org/BeatTeam/some-background-on-the-ge-and-pcb-issue/

[7] "GE/Housatonic River Site Community Update," U.S. Environmental Protection Agency, August 2009, https://semspub.epa.gov/work/01/456069.pdf.

other communities impacted by severe chemical contamination are fighting to protect the health of their communities, both human and more-than-human, and navigate life in contaminated landscapes and bodies. I quickly came across the community of Bayview-Hunters Point (BHP), located in San Francisco, who has had a fight spanning over half a century against industrial and nuclear contamination. The community was also home to the largest redevelopment project that San Francisco had seen since the 1906 earthquake, and one of the largest environmental remediation sites in the nation, the Hunters Point Naval Shipyard (HPNS). The intersection between San Francisco and its industries' drive for capital accumulation, the looming displacement of predominantly Black and Latinx communities from the proposed redevelopment, and the vibrant grassroots politics that have emerged against conditions of toxicity inspired me to research further into the politics of the Superfund site. Within these intersections, interesting contradictions exist between waste, value, and race. The confluence between these forces result in novel insights about how race and waste, and waste and place, have been constructed, and most importantly, about how communities were organizing themselves in new formations of politics against toxicity—both that which comes from harmful molecules and the drive for capital accumulation.

Research questions

In my first chapter, I ask how are landscapes culturally and socially constructed as wasted? How do these constructions impact racial formations on the site? I was primarily interested in exploring how associations of waste with race and race with waste impacted the biopolitical management of bodies. I also wanted to understand how associations of waste with the landscape

and its value changed under the various cultural and political geographies of the site, whether they be indigenous, settler, immigrant, industrial, or Black use and settlement.

Environmental remediation is overwhelmingly posed to be a "good" outcome for a Superfund site; the Superfund status itself is a strange collaboration between municipal governments, federal regulatory agencies, and private companies. In researching this site, I was interested in delving into the politics of its remediation. My interest in exploring the technical logics of remediation stemmed from learning about the impossibility of remediating nuclear waste, which can only be displaced, not "solved." HPNS is contaminated with both industrial waste and nuclear waste from the Naval Radiological Defense Laboratory (NRDL). If nuclear waste isn't being remediated, then where's it going? I quickly learned that the site was plagued with controversies, ranging from falsified post-remediation samples to the City of San Francisco ignoring Proposition P, which was a referendum where residents voted for the total cleanup and removal of toxicants from the site. These controversies, where the state and remediation actors were cutting corners to speed up remediation and develop the site, inspired me to look at what tools and strategies were being used to detect and carry out environmental remediation, and if they were effective at their goals. In my research, I specifically asked, how do the fundamental limits of human knowledge and perspectivity impact the effectiveness of sensing devices and remediation strategies? And how do the market forces of capital accumulation and other ideologies shape the techniques, strategies, and policies governing the environmental remediation of the site and its actors, including contractors, government agencies, and the City of San Francisco? My goal in this section, which forms my second chapter, was not to invalidate grassroots calls for environmental remediation, but to understand if the methods for resolving states of toxicity were actually effective.

In my third chapter, I ask what can grassroots toxic politics teach us about how to live and act in an already-contaminated world? I want to be explicit that my research does not attempt to invalidate environmental remediation or protests against toxic contamination, but seeks to understand what novel forms of political action and ethical obligations are produced from conditions of toxicity. I also wanted to explore new conceptions of toxicity that are attentive to the socio-historical forces and chemical infrastructures that lead to toxic slow violence,[8] instead of just reifying the apolitical toxic molecule.

Methodologies

The scope of my research questions is strongly shaped by my American Studies education at Williams College. The major's interdisciplinary nature has informed my multidisciplinary approach to my research questions, which uses theories and methods from fields including science and technology, discard, queer, environmental, and Black studies. In addition, my education from courses such as Foundations in Sexuality Studies with Professor Kelly Chung introduced me to queer and crip theory, which forms the foundation for my theorizations of the integration of social and chemical relations. Along with Professor Hossein Ayazi's (De)colonial Ecologies, I began to think about how conditions of toxicity can queer bodies. In this course, I was also first exposed to critical studies of the "natural," which underpin my critique of technoscientific forms of knowledge production. Moreover, across the courses I have taken in the major, many of which were cross-listed in Womens, Gender, and Sexuality Studies, Africana Studies, and Environmental Studies, I have learned to be deeply attentive to gendered and

[8] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Massachusetts: Harvard University Press, 2011).

racialized constructions of seemingly non-political policies and structures, which helped attune me to the necropolitical management and expropriation of Black bodies in BHP.

In Chapter 1, I use newspaper articles on Bayview-Hunters Point to investigate how cultural attitudes towards waste were deployed in the characterization of racial bodies and behaviors in San Francisco's Black enclaves. My timeline ranges from 1868, following an ordinance in San Francisco that banned the slaughter and processing of animals within the city proper, to the end of The Fillmore District's redevelopment in 1972. These articles were crucial for my research as they allowed me to understand popular cultural attitudes of waste, race, and Black spaces. They also gave me insights into community-perspectives on the issues that I was interested in through interviews with residents. This research is accompanied with an analysis of urban planning documents and how San Francisco's municipal government codified these cultural attitudes and racial formations in their logics of redevelopment. These analyses are grounded in a theoretical discussion of the ways waste discourses construct particular landscapes as wasted, relying on a discussion of value that draws heavily from Locke's insights into "proper management" of land during early stages of settler colonialism and how land is conceptualized as wasted or valued.[9]

I then explore how discourses of redevelopment hemorrhaged the political power and autonomy of Black communities, drawing heavily on Neil Smith's work in "Towards a Theory of Gentrification"[10] and applying it to the way the City of San Francisco and local newspapers talked about BVHP. Finally, I investigate early BVHP environmental justice grassroots

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[9] Vinay Gidwani and Rajyashree N. Reddy, "The Afterlives of 'Waste': Notes from India for a Minor History of Capitalist Surplus," *Antipode* 43, no. 5 (June 6, 2011): 1625–58, https://doi.org/10.1111/j.1467-8330.2011.00902.x.

[10] Neil Smith, "Toward a Theory of Gentrification a back to the City Movement by Capital, Not People," *Journal of the American Planning Association* 45, no. 4 (October 1979): 538–48, https://doi.org/10.1080/01944367908977002.

movements to understand how BVHP communities were fighting the political and cultural effects of having their bodies and landscapes be designated as wasted. I picked my case studies due to their importance to the lineage of environmental justice activism in BVHP. The Hunters Point-Bayview Community Health Service was important because it was the first environmental justice-focused organization within the community, founded in 1967, and relied on social models of healthcare. Greenaction was the subject of my subsequent case studies, as it has played a crucial role in organizing BVHP in fighting for virtually every facet of environmental injustices happening in the community. I analyzed these movements and programs predominantly from the resources directly produced by these groups, and used contemporary newspaper articles about grassroots actions to research additional context to these actions and the effects they had on the community.

In Chapter 2, my interest in exploring the technical logics of remediation stemmed from learning about the impossibility of remediating nuclear waste, which can only be displaced, not "solved." If nuclear waste isn't being remediated, then where's it going?

My methodology for investigating this question took three different perspectives: treating this issue as a political and historical material problem, an epistemological-ontological problem, and a broader philosophical problem. My writing is undergirded by Jakob von Uexkull's theory of *Umwelt* to analyze the epistemological disjuncture between what one perceives of and as their environment, or the *Merkwelt*, and their reality-generating activity, or *Wirkwelt*.[11] This produces an understanding of the environment as fundamentally indeterminable, suggesting that remediation engineering strategies are bound to fail to some degree. As a material issue, I investigate the case of Tetra Tech Inc., an environmental remediation company which was

[11] Sara Asu Schroer, "Jakob von Uexküll: The Concept of Umwelt and Its Potentials for an Anthropology beyond the Human," *Ethnos* 86, no. 1 (June 14, 2019): 1–21, https://doi.org/10.1080/00141844.2019.1606841.

accused of falsifying remediation results. I use newspapers and environmental regulatory documents to research various details about the case and connect them to theories in political economy on the logics of development and capital accumulation. Approaching remediation as an ontological-epistemological issue, I analyze the specific remediation strategies being used through looking at the Navy's and developer's primary source documents. I compared them with literature in the field of environmental chemistry to understand how these strategies are broadly ineffective, specifically regarding the ways chemicals could intermix and leak through various environmental factors that were overlooked by the Navy. This section is placed after a history of the site so that this work is contextualized by a history of racialization in BHP.

In Chapter 3, I survey contemporary discussions of toxic contamination and political responses to it. In this chapter, I reformulate and reconceptualize toxicity to describe a "disruption of particular existing orders, collectives, materials and relations."[12] This moves an understanding of toxicity focused on the fetishization of individual harm-causing molecules,[13] and towards the structures and spatial distributions of power that simultaneously allowed BVHP to become a segregated Black enclave and also located the majority of San Francisco's heavy industries in that enclave. I use Michelle Murphy's term, chemical infrastructures,[14] as a tool to trace the spatial distribution of molecules from their cyclical mobilities in our bodies and ecosystems, to the corporations, environmental regulatory agencies, and other state and corporate apparatuses that enabled toxic conditions of life among BVHP's residents, both human and

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[12] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.
[13] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.
[14] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02.

more-than-human. Under conditions of toxicity and slow violence,[15] a new toxic politics emerges which "rehearses an analytic for understanding and intervening into toxicity both as an affection/affliction and as an infrastructure and infrastructuring process with power relations and what counts as good and proper relations at its core."[16]

I delve deeply into case studies of the political campaigns and programs of Greenaction, a grassroots environmental justice organization based in Bayview-Hunters Point, and the way they use these various theoretical tools and other strategies to fight against conditions of toxicity and navigate life in an already-contaminated world. I used this specific organization as a case study as it has had a presence in virtually every BHP environmental justice campaign in the past two decades, and has ties with community organizers reaching far before that, showing its strong ties to the community. Moreover, the group has novel programs that are building social infrastructures in response to and alongside chemical infrastructures, such as the mapping and air quality monitoring project, which shows a deep commitment to figuring politics and subjectivities in an already-contaminated world. The position I take towards these programs—the way they were conceptualized, the philosophies guiding their mission, the actions and goals they accomplish—is as a representation of residents' and communities' political will to live otherwise. I thus attempt to engage as deeply as possible with these programs, like analyzing 300 resident-submitted environmental violations from Greenaction's toxic mapping project, in order to better understand how individuals specifically were forming new toxic subjectivities and politics.

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[15] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Massachusetts: Harvard University Press, 2011).
[16] Noémi Tousignant, *Edges of Exposure Toxicology and the Problem of Capacity in Postcolonial Senegal* (Durham London Duke University Press, 2018).

I also present a creative project using the medium of sound to attune us to our own toxic subjectivity. For my project, I made a sound walk that includes found sounds from contaminated sites to help elucidate novel connections we can make with the chemicals that permeate through our land and bodies here in Berkshire County. I was attracted to the medium of sound because when dealing with materials like toxicants that defy most human sensory apparatuses, something tangible like sound can help tune us to the chemical relations we embody and enter.

Methods

In Chapter 1, I begin by applying Locke's theories on the figure of waste (which I mostly found through articles by Gidwani and Reddy) to the historical racial geographies of the site, which I analyzed through newspaper articles, to understand how the site came to be understood as a wasted landscape. I analyzed the ways racial formations and cultural waste associations developed through analyzing historical newspaper articles and resident interviews within these articles. A 1972 profile on BVHP by the San Francisco Chronicle was particularly useful for this analysis, titled "Inside Hunters Point" and "Outside's Impact on Hunters Point," as it was one of the only historical texts concerning BVHP that was heavily informed by resident's perspectives. All of the San Francisco Chronicle's articles that I used were found on the Chronicle's archives website. I then connected these waste and racial formations to the logics of the redevelopment of The Fillmore District, and the displacement of virtually all of San Francisco's Black population to BHP, using the City of San Francisco's planning documents, particularly "New City: San Francisco Redeveloped," published in 1947; this document was found in the San Francisco Public Library's archives. The planning document included utopian visions for a

post-redeveloped San Francisco, and included in-depth analyses of issues currently facing San Francisco from the perspective of the municipal government.

In studying historical grassroots actions in BVHP, I relied heavily on documents produced directly as a result of organizing efforts. This includes "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," published by the Bayview Hunters Point Mothers Enviornmental Health & Justice Committee, Huntersview Tenants Association, and Greenaction for Health & Environmental Justice, and "Hunters Point-Bayview Community Health Service News," published by the Hunters Point-Bayview Community Health Service.

I used a variety of sources to investigate my research questions in Chapter 2. I made claims about the Tetra Tech Inc. fraud case using news articles from the San Francisco Chronicle and the Courthouse News Service that detailed specificities of the whistleblowers' allegations, including accounts of malpractice. I connected insights from these articles to political economy theories on the logics of development and capital accumulation. Regarding the resident perspectives on the Candlestick Stadium case, I drew on interviews from Lindsey Dillon's article, "The Breathers of Bayview Hill."[17]

In the "Ontology, Epistemology, and Remediation" section, I researched Navy, developer, municipal, and environmental regulatory agency documents to understand the environmental detection and remediation strategies that were being used on the site. This included: the CP Development Company's "Risk Management Plan," which detailed how the developer would break the Institutional Controls put on the site during construction; schematic designs prepared by the San Francisco Redevelopment Agency and Lennar to examine how different flora might

[17] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/.

displace "contained" contaminants in the soil; and the Navy's "Record of Decision" (ROD) articles for various land parcels, which discussed and chose the specific remediation strategies that would be used for a specific parcels. Many of these articles, especially the Navy's ROD articles, were hidden among layers and layers of webpages, many of them defunct, so I often had to rely on secondary sources such as developer documents and news articles to understand a parcel's remediation process. I critiqued the claims made in these texts about the effectiveness of particular strategies by cross-referencing them with documents such as: the University of California's "Tips on Irrigating Vegetables," to understand how plant roots could concentrate contaminants in the plant body; peer-reviewed environmental chemistry and EPA articles on plant stomata and how they can potentially release radionuclides during transpiration; peer-reviewed animal behavior articles on how animal burrowing can displace buried hazardous waste; a United States Geological Survey on the risks of liquefaction; citizen science papers such as "From Cleanup to Coverup,"[18] which detailed how the Navy was covering up their illegitimate remediation strategies, and "Buried Problems and a Buried Process,"[19] which covered sea level-rise risks to the contained contamination in the soils.

For my last section on "Philosophical Problems," I used applied Jakob von Uexkull[20] theory of Umwelt, Barbara Adams' theory on accelerated and deaccelerated landscapes, and Elizabeth Grosz's theory on duration to understand contamination as being indeterminable and a permanent feature of life on the HPNS site and its neighboring communities. These theories were

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[18] Daniel Hirsch et al., "From Cleanup to Coverup," Committee To Bridge The Gap, August 2019, https://www.committeetobridgethegap.org/hunters-point-reports/FromCleanupToCoverup.pdf, 14.
[19] "Buried Problems and a Buried Process: The Hunters Point Naval Shipyard in a Time of Climate Change," City and County of San Francisco Civil Grand Jury, June 14, 2022, https://civilgrandjury.sfgov.org/2021_2022/2022%20CGJ%20Report_Buried%20Problems%20and%20a%20Buried%20Process%20-%20The%20Hunters%20Point%20Naval%20Shipyard%20in%20a%20Time%20of%20Climate%20Change.pdf.
[20] Jakob von Uexküll, *A Stroll through the Worlds of Animals and Men* (International Universities Press, 1992).

grounded by examples of the various ways humans and other actors attempt to change landscape processes and their indeterminable effects.

In Chapter 3, after my theoretical discussions outlined in the "Methodologies" section, I conduct a deep dive into all of Greenaction's current environmental justice programs. The programs I review include an online environmental violation mapping project, an online air quality monitoring network, and other grassroots movements and campaigns around the toxic contamination of Bayview-Hunters Point and the displacement resulting from its redevelopment.[21] I picked this organization to be my primary case study again because it is a community leader in not only organizing social movements, but developing long-term responses to conditions of toxicity that protect the community's health and help adapt the community to conditions of contamination.

Chapter Overview

In Chapter 1, I show how cultural associations of waste are often attached to racial formations, specifically in regards to San Francisco's Black populations. These waste-race associations impact the necropolitical management of Black bodies, dispossessing them of lands located in valued areas and segregating them into neighborhoods already marked as wasted. These wasted neighborhoods are constructed as being devoid of value due to Lockean ideas of what is understood as waste and value. These conceptions of value also strip the political autonomy of BVHP. I conclude with an examination of how BVHP's Black communities have understood these cultural and political associations, and research historical grassroots movements in BVHP that have successfully mobilized against them.

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[21] "Bayview Hunters Point," Greenaction for Health & Environmental Justice, n.d., http://greenaction.org/bayview-hunters-point/.

In Chapter 2, I argue that environmental remediation efforts, as are currently taking place in the HPNS Superfund site, are ineffective at preventing chemical contamination from disrupting life in BVHP. From case studies of the Tetra Tech Inc. fraud and the Candlestick Stadium case, I show how the market forces of capital accumulation prevent state, regulatory, and remediation actors from completing the remediation of chemicals in accordance with Proposition P. On an ontological and epistemological level, tools and strategies to detect and remediate chemical contamination fail to take into account the complexity of environmental factors. Finally I claim that these strategies are bound to fall short of their projected impact—which is to return the site to its pre-industrial condition—because they ignore the ways in which chemicals have already integrated into the landscapes, and bodies, of BHP.

In Chapter 3, I undertake the project of reformulating popular conceptions of toxicity to expand the term from addressing individual, harmful molecules to addressing the systems of power that allow certain populations and lands to be contaminated. This produces novel forms of toxic politics focused on living with conditions of toxicity. I examine toxic politics in case studies of Greenaction's current environmental justice programs to create social infrastructures to protect the health of BVHP's communities.

Finally, in my conclusion, I introduce the term toxic subjectivity to refer to the re-orientation towards life with toxicity one is forced to adopt as a result of "living in prognosis."[22] This term builds on discourses in crip theory which expose the parody of an able-bodied, or in this case uncontaminated, existence, which opens us up to the plurality of forms of embodiment and desire in the midst of contamination. It also builds on Michelle Murphy's concept of the alterlife, which describes how contaminated politics is as much about

[22]Sarah Lochlann Jain, "Living in Prognosis: Toward an Elegiac Politics," *Representations* 98, no. 1 (2007): 77–92, https://doi.org/10.1525/rep.2007.98.1.77.

"figuring life and responsibilities beyond the individualized body as it is about acknowledging extensive chemical relations."[23]

[23]Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02.

Chapter 1: A History of Bayview-Hunters Point Through the Lens of Waste

Introduction

Bayview-Hunters Point's demarcation as a Black enclave cannot be separated from the site's historical association with waste. Understood through media and planning sources as being outside the urban geography of modernity, Bayview-Hunters Point became the site of heavy industry in the nineteenth century. Even before information about the health hazards of industrial chemicals was widely known, the odors and visual imagery of heavy industry was believed to be enough to contaminate San Francisco's image of being a financial and cosmopolitan hub, justifying its relocation to this neighborhood. The San Francisco city government took a similar approach to their biopolitical management of Black bodies, as seen in a 1968 city report which talked about Bayview-Hunters Point as San Francisco's "dumping ground" in reference to its Black population living in public housing.[24] The management of the neighborhood's spatial fabric reflected the conception of the site as a landfill of Black bodies, with residents claiming that street cleaners rarely came to the neighborhood, in addition to its poor hygiene management, with infestations of rats and cockroaches. In this chapter, I examine how these cultural and racial formations around waste came to be formed, and investigate community responses to the political and cultural violence resulting from this multivalent association with waste.

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[24] City and County of San Francisco, *Application to the Department of Housing and Urban Development for a Grant to Plan a Comprehensive Model Cities Program: Bayview-Hunters Point Model Neighborhood,* 1968.

Historical and Theoretical Constructions of Waste, Place, and Race

The Bayview-Hunters Point districts' relationship with waste and wasting began in 1868, following an ordinance in San Francisco that banned the slaughter and processing of animals within the city proper. Butchers across the city took their operations to the tidal marshlands of the Bayview, in the southeast corner of San Francisco, and established a meat-packing district which grew to include 18 slaughterhouses and their accompanying processing facilities like tanneries[25]; this new industrial settlement came to be called Butchertown. There was subsequently a diphtheria outbreak in 1888 due to poor sanitation practices, with decaying animal remains and line animals being found underneath many slaughterhouses,[26] foreshadowing the entanglement of waste and contamination with the landscape and racialized people's bodies in the decades to come.

Following the establishment of the meat-packing district, the rest of San Francisco's noxious industries began relocating to this area, away from the "public" eye, which was important to the city's public image as it was becoming a cosmopolitan and financial hub of the West. The district's primary residents were non-Anglo immigrant groups like Italian, Maltese and Irish Americans, who were racialized as non-white at the time.[27] These ethnic groups had strong ties to one another during a time in San Francisco when they lived in separate neighborhoods. There was also a generally strong sense of community which was a product of this isolation from the metropole, and a flourishing of commerce due to the area's proximity to

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[25] Susana Guerrero, "SF's Long-Forgotten Slaughterhouse District Was in the Bayview," SFGATE, January 25, 2022, https://www.sfgate.com/food/history/article/Butchertown-was-San-Francisco-slaughterhouses-16749759.php.

[26] Susana Guerrero, "SF's Long-Forgotten Slaughterhouse District Was in the Bayview," SFGATE, January 25, 2022, https://www.sfgate.com/food/history/article/Butchertown-was-San-Francisco-slaughterhouses-16749759.php.

[27] Matthew Frye Jacobson, *Whiteness of a Different Color* (Harvard University Press, 1999), 4.

water and open land.[28] Concurrent industries included the shrimping industry, which started in 1870 and was headed by Chinese immigrants, the shipbuilding industry, which began in 1868, and coal and oil-fired power plants, which were established in 1929 to supply electricity to San Francisco.[29] The shrimping industry in the area shut down in the 1930s, the shipbuilding industry post-World War 2, and the meat-packing industries in 1971, but BHP is still home to power plants and many new heavy industries. San Francisco's first zoning ordinance, passed in 1921, relegated the land use along the southeastern waterfront (location of Bayview-Hunters Point) for Industrial use,[30] but also allowed residential development, presumably to maintain a local labor supply. This zoning codified Bayview-Hunters Point's landscape as a site of waste, and also facilitated the development of the neighborhood as a site of racialized labor.

From the beginning of San Francisco's urban development, Chinese immigrants had been establishing fishing villages all along the bay. They controlled the shrimping industry in the area, harvesting 5.4 million pounds of shrimp between 1870 and 1895.[31] The settlement along the India Basin in Hunters Point was one of the most productive. Most immigrants lived along the shore next to their places of work, with some even living in the same structures where they worked.[32] In *Animal City: The Domestication of America*, Andrew Robichaud writes that "the spatial isolation of these camps probably offered refuge for Chinese men, away from a

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[28] Chris Carlsson and LisaRuth Elliott, "Butchertown's Beginnings," Foundsf.org, 2017, https://www.foundsf.org/index.php?title=Butchertown%27s_Beginnings.
[29] Susana Guerrero, "SF's Long-Forgotten Slaughterhouse District Was in the Bayview," SFGATE, January 25, 2022, https://www.sfgate.com/food/history/article/Butchertown-was-San-Francisco-slaughterhouses-16749759.php.
[30] "San Francisco Building Ordinance No. 5464" (San Francisco City Planning Commission, October 3, 1921), https://archive.org/details/sf-zoning-1921-10/mode/1up.
[31] Chris Carlsson, "Chinese Shrimping Villages," Foundsf.org, 2017, https://www.foundsf.org/index.php?title=Chinese_shrimping_village.
[32] Chris Carlsson, "Chinese Shrimping Villages," Foundsf.org, 2017, https://www.foundsf.org/index.php?title=Chinese_shrimping_village.

discriminatory landscape downtown."[33] This indicates how, similar to the settlement of Butchertown's labor force, Chinese immigrants found safety in their distance from the metropole-proper. While Bayview-Hunters Point was used as a "dumping ground"[34] for activities and people deemed unvalued by the state, this status also allowed it to be a safe community for racialized others. However, "to outsiders, the lives and work environments of Chinese shrimpers were improper… adding to white hostility, most of the shrimp were exported to China… This export economy angered many whites, who saw the natural bounty of the bay sold away to China for the profit of Chinese immigrants and merchants."[35] While this quote doesn't specifically speak to the inter-neighborhood racial dynamics in Bayview-Hunters Point (also known as Butchertown), it shows how the use of the land was tied to racialization, waste, and value, as will be discussed in the following paragraphs.

Development in Bayview-Hunters Point follows specific patterns corresponding to the demarcation of its landscapes as wasted or valued. In the mid 19th-century, the site was targeted for the development of San Francisco's noxious industries due to its spatial and temporal distance from the metropole of San Francisco-proper. At the time, the site was understood to be wasted due to its unproductive landscape. This was a site that had yet to undergo extraction of its land's space and resources, or "improvement," in the eyes of settlers. Its temporal distance came from a state of primitivity associated with this type of land unproductivity. Liberal notions of metaphorical waste made the space productive as a palace for literal waste (as byproducts of modernity) and for the containment of people historically regarded as capital's surplus labor.

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[33] Andrew Robichaud, *Animal City : The Domestication of America* (Cambridge, Massachusetts: Harvard University Press, 2019), 108.
[34] City and County of San Francisco, *Application to the Department of Housing and Urban Development for a Grant to Plan a Comprehensive Model Cities Program: Bayview-Hunters Point Model Neighborhood,* 1968.
[35] Andrew Robichaud, *Animal City : The Domestication of America* (Cambridge, Massachusetts: Harvard University Press, 2019), 108.

This liberal understanding of development comes from the political theory of John Locke, who developed modern political conceptions about waste alongside the rights to sell one's labor and private property. Gidwani and Reddy claim that Locke believed the figure of waste to be "the constitutive outside of modern society—that which must be continuously acted upon and improved, first to enable passage from the state of 'nature' to the state of 'civil society' and subsequently to preserve that order of society."[36] These ideas were applied to the settler-colonial enclosure of American territories, which were understood to be in a state of "nature." Locke's justification of English dispossession of indigenous peoples of America was that they failed to enclose their lands, or institute the legal-liberal idea of private property, and when they did, they let it lie fallow or did not capture the totality of its productivity,[37] showing that they did not make rational use of it. Locke thus concluded that "Indians were not entitled to have their territorial integrity respected by others."[38][39]

These ideas were then applied to the enclosure movement in England, where the working class, who depended on common land for their livelihoods were likened to the savages of North America, and the idea of a commons was called the barbarous usage of remote ages.[40] The perceived "backwardness" of the activities of indigenous peoples of North America were used to racialize them, showing how the creation of waste not only marked landscapes but also bodies. Furthermore, there is an underlying assumption in the Lockean drive for the improvement of land, which indigenous people did through alternate forms of enclosure, which specifically

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[36] Gidwani and Reddy, "The Afterlives of 'Waste,'" 6.
[37] Gidwani and Reddy, "The Afterlives of 'Waste,'" 7.
[38] Bikhu Parekh, "Liberalism and Colonialism: A Critique of Locke and Mill," *Decolonisation of Imagination*, 1995, 81–98.
[39] Vinay K. Gidwani, *Capital, Interrupted: Agrarian Development and the Politics of Work in India* (U of Minnesota Press, 2008), 13.
[40] Allan Greer, "Commons and Enclosure in the Colonization of North America," *The American Historical Review* 117, no. 2 (April 2012): 365–86, https://doi.org/10.1086/ahr.117.2.365.

implicates white, propertied Europeans and Americans, whose labor would ensure "proper" improvement of the land.[41] In contrast, the "unproductive" activities of indigenous peoples, along with the uncultivated American waste/landscape, were used as justification for dispossession and development.

Lockean ideas of improving wasted landscapes, or making them more productive are deeply ingrained within liberal humanism, and have been used to justify development in Bayview-Hunters Point in various points of its history. Following its initial development, the Navy violently displaced Chinese immigrants who had begun small shrimping operations along the coast. This was due to World War 1, which greatly increased the demand for naval vessels, leading to the expansion of the shipbuilding industry in San Francisco. This shipyard occupied the same waterfront in India Basin as the Chinese immigrant communities. The Navy subsequently purchased a section of the waterfront to establish the San Francisco Naval Shipyard in 1939. This land, seized under eminent domain, was primarily taken from the Chinese immigrants who controlled the shrimping industry. To facilitate the transition, the San Francisco Health Department burned down the shacks and docks of the immigrants, displacing them from Bayview-Hunters Point and depriving them of their livelihoods.[42] This move mirrors the site's contemporary redevelopment: the state had no issue with Chinese immigrants settling in Bayview-Hunters Point due its designation as a space of industrial waste, until the point that the area became "more" productive for military and economic development.

During World War 2, the Naval Shipyard made the district into an institutionally segregated boomtown. Due to demand for labor supply, Bayview-Hunters Point became home to thousands of Black migrants from the South during the war in the Second Great Migration; the

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[41] Gidwani and Reddy, "The Afterlives of 'Waste,'" 25.
[42] "History BVHP - Bayview Opera House," Bayview Operahouse, n.d., https://bvoh.org/culturehub/history-bvhp/.

districts' population increased from 13,000 to 51,000 people, and the Black population increased by 600%.[43] To address the area's housing shortage, the San Francisco Housing Authority built 5,000 temporary housing units in 1942 to house a total of 14,000 people.[44] The development was supposed to be integrated, with apartments being assigned on a first-come first-serve basis, but the Navy objected, claiming that "integration would cause racial conflict among workers and interfere with ship repair."[45] The Housing Authority submitted to the demand and segregated Black families in the development. Due to discrimination from landlords, Black workers' housing demand was much higher than that of white workers, resulting in white units sitting vacant while Black units had long waiting lists. This shows us how, even in the successive revaluations of landscapes and bodies in this period, the military upheld a possessive investment in whiteness, even at the cost of wasted resources and capital. This shows how certain forms of waste, like that of resources, is acceptable to the state as long as it maintains ideological and dispossessive projects like the displacement of Black communities. The Housing Authority also pushed to have an all-white police force, most of whom were recruited from the South, govern the neighborhood.[46] By the end of the war, due to systems like restrictive covenants and redlining policies, over a third of Black San Franciscans were residing in segregated public housing projects in either The Fillmore or in temporary barracks in Hunters Point; these "temporary" barracks housed Black residents for 25 years after the war ended.[47]

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[43] Albert S. Broussard, *Black San Francisco: The Struggle for Racial Equality in the West, 1900-1954*, *Google Books* (University Press of Kansas, 1993), https://books.google.com/books/about/Black_San_Francisco.html?id=jgwVAAAAYAAJ, 4
[44] Albert S. Broussard, *Black San Francisco: The Struggle for Racial Equality in the West, 1900-1954*, *Google Books* (University Press of Kansas, 1993), https://books.google.com/books/about/Black_San_Francisco.html?id=jgwVAAAAYAAJ, 135.
[45] Richard Rothstein, "Public Housing, Black Ghettos," *The Color of Law: A Forgotten History of How Our Government Segregated America* (New York; London: Liveright Publishing Corporation, 2017).
[46] Richard Rothstein, "Public Housing, Black Ghettos," *The Color of Law: A Forgotten History of How Our Government Segregated America* (New York; London: Liveright Publishing Corporation, 2017).
[47] Richard Rothstein, "Public Housing, Black Ghettos," *The Color of Law: A Forgotten History of How Our Government Segregated America* (New York; London: Liveright Publishing Corporation, 2017).

Analyzing the Logics of Re/Development: A Case Study of The Fillmore

A case study of the state interests, private interests, and justifications used for the urban renewal of The Fillmore District gives us an understanding of how the dynamics of development work in and through the figure of waste. The Fillmore District is located in northeast San Francisco, and became a predominantly Black neighborhood in the Second Great Migration when Black populations moved to the West Coast to fill jobs related to World War 2 industries.

It was conventional wisdom at the time that razing slums would lead to a revival of urban centers, with President Harry Truman endorsing "slum clearance" to combat the post-war housing shortage in the 1949 State of the Union,[48] and a 1945 San Francisco Chronicle op-ed stating, "bluntly, nothing can be done to improve housing conditions here until a lot of people clear out."[49] The California Community Redevelopment Act of 1945 created municipal-level systems to fund and implement urban renewal through the creation of redevelopment agencies (RDAs). RDAs, which were public, for-profit corporations, could "issue bonds against expected earnings and property tax increases and sell mortgages to finance massive undertakings that literally leveled entire neighborhoods."[50] With local planning commissions tasked with identifying blighted areas for redevelopment, this RDA system brought together the state's necropolitical[51] regime with private capital, with both feeding off one another, allowing the city

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[48] Harry Truman, "State of the Union," 1949.
[49] Walter Thompson, "How Urban Renewal Destroyed the Fillmore in Order to Save It," hoodline, January 3, 2016, https://hoodline.com/2016/01/how-urban-renewal-destroyed-the-fillmore-in-order-to-save-it/.
[50] Walter Thompson, "How Urban Renewal Destroyed the Fillmore in Order to Save It," hoodline, January 3, 2016, https://hoodline.com/2016/01/how-urban-renewal-destroyed-the-fillmore-in-order-to-save-it/.
[51] J.-A Mbembé and Libby Meintjes, "Necropolitics," *Public Culture* 15, no. 1 (2003): 11–40, https://warwick.ac.uk/fac/arts/english/currentstudents/postgraduate/masters/modules/theoryfromthemargins/mbembe_22necropolitics22.pdf, 39.

to improve its aesthetic image and raise taxes, giving investors an almost-guaranteed return on investment, and generating work for construction and developer companies. These plans entailed a total re-creation of the neighborhood's spatial fabric, as RDAs had plans for every facet of a community's needs, including, housing, density, traffic management, zoning, and commerce; if approved, RDAs would purchase or claim by eminent domain entire swathes of a neighborhood's land parcels.[52]

The justifications used show how, as Gidwani and Reddy argue, "waste is the specter that haunts the modern notion of value," both through the logics of capital accumulation and in a template for moral conduct.[53] Planners cited the large amounts of trash accumulating in backyards and hallways in The Fillmore, poorly maintained fire escapes and electrical wiring, and the disproportionately high cases of tuberculosis as some of the material indicators that marked the neighborhood for redevelopment.[54] Here, waste as trash functions as a material index of degeneration that makes possible gentrification and redevelopment, ignoring the uneven geography of racial capitalism that disinvested in these places through the lack of infrastructural improvement and poor public health planning, both of which are due to the intentional negligence by the state.

Waste also serves as a discursive index of degeneration through its deep associations with Black bodies and activities. A white resident of Fillmore named Charles Collins said in an interview that "the Fillmore did not feel blighted to me as a child. The only way that you can get to the issue of blight is to determine that the people who were living there, largely African American, had low incomes. You have to read into the idea that these absolutely beautiful

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[52] Walter Thompson, "How Urban Renewal Destroyed the Fillmore in Order to Save It," hoodline, January 3, 2016, https://hoodline.com/2016/01/how-urban-renewal-destroyed-the-fillmore-in-order-to-save-it/.
[53] Gidwani and Reddy, "The Afterlives of 'Waste,'" 23
[54] City and County of San Francisco, "New City: San Francisco Redeveloped," December 29, 1947.

Victorian buildings were also blighted because they were populated by black people."[55] Poverty and Blackness were thus used as direct indicators of blight. An RDA report uses a moralizing discourse to strengthen this association, claiming that residents were being succumbed by moral decay due to the location of "71 bars, 45 liquor stores, numerous smoke shops and magazine stands suspected of gambling joints and bookies in disguise… and 'hotels' that accommodate members of the 'world's oldest profession,'"[56] in the neighborhood. Crime statistics were also used as a justification, with the city claiming that the per-capita outlay for police services was $23.28 compared to 26 cents in the Marina district.[57] These statistics, however, say nothing about the actual number of "criminal" activities on the ground and instead only give information about the geographies that the city heavily surveilled and criminalized. Finally, the informal subdivision of single-family homes into boarding houses was used as another justification as it associated the neighborhood with illegality. A simple political-economic analysis of the critique of informal residences shows that there is nothing innately or morally wrong with subdividing homes to meet a crucial human rights need. The justification here instead lies in the city and landowners' loss of capital due to avoided rent and property taxes. Waste is not just mapped onto Black life, but discourses of waste and wasted landscapes are specifically produced to enclose Black life, which has been incessantly attacked by racial capitalism's uneven geographies, for the purposes of justifying gentrification and displacement.

The city's management of the population displaced from The Fillmore gives insight into the logic of redevelopment that the city was operating under from the 1940s to the 1970s, which

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[55] "The Fillmore: Charles Collins," Fillmore Stories (PBS, 1999), https://www.pbs.org/kqed/fillmore/learning/people/collinsc.html.

[56] City and County of San Francisco, "New City: San Francisco Redeveloped," December 29, 1947.

[57] City and County of San Francisco, "New City: San Francisco Redeveloped," December 29, 1947.

naturalizes gentrification and displacement as "improvements"[58] to the urban structure. The vast majority of Fillmore residents were renters, as redlining had prevented people from being able to secure home loans. City planners had estimated that the new rent would rise to approximately $25 to $30 per room per month, at a time when San Francisco's median gross rent was $32 per month.[59] This was far more than Fillmore's residents could afford, as explicitly stated by T. J Kent, Jr., the city's planning director at the time, who said that "the rents will be too high for a large group of residents."[60] With no housing equity, the vast majority of residents would be displaced, cementing the redevelopment project as a process of displacement of what the city had deemed a surplus population. According to the logics of redevelopment, displacement is naturalized as progress.[61]

In *Toward a Theory of Gentrification*, Neil Smith talks about how in the face of redevelopment proposals that seek to reproduce capital through property investments and speculation, poor people are denied the autonomy and agency to "improve" their urban structure.[62] As seen from this case, the devaluation of Black life and community is a necessity to the redevelopment project, as discourses of moral decay invalidate the right of Black residents to the city. Instead, interests that seek to produce capital and preserve structural and cultural

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[58] Neil Smith, "Toward a Theory of Gentrification a Back to the City Movement by Capital, Not People," *Journal of the American Planning Association* 45, no. 4 (October 1979): 538–48, https://doi.org/10.1080/01944367908977002.
[59] Walter Thompson, "How Urban Renewal Destroyed the Fillmore in Order to Save It," hoodline, January 3, 2016, https://hoodline.com/2016/01/how-urban-renewal-destroyed-the-fillmore-in-order-to-save-it/.
[60] Walter Thompson, "How Urban Renewal Destroyed the Fillmore in Order to Save It," hoodline, January 3, 2016, https://hoodline.com/2016/01/how-urban-renewal-destroyed-the-fillmore-in-order-to-save-it/.
[61] Marisa Solomon, "'The Ghetto Is a Gold Mine': The Racialized Temporality of Betterment," *International Labor and Working-Class History* 95 (2019), https://doi.org/10.1017/s0147547919000024, 77.
[62] Neil Smith, "Toward a Theory of Gentrification a Back to the City Movement by Capital, Not People," *Journal of the American Planning Association* 45, no. 4 (October 1979): 538–48, https://doi.org/10.1080/01944367908977002.

investments in whiteness take control. Without this devaluation, calls for the "improvement" of the urban structure driven from below would have to be legitimated and heard, as Fillmore's Black residents are the stakeholders who acutely understand the degradation of their social and material conditions by the state, and thus, know how to fix it. Temporally, as Marisa Solomon puts it, Black landscapes are thus understood to be "always behind, and thus always susceptible to violent wrenching into a cleaner, whiter future."[63] This ties directly back to Locke's arguments regarding the necessity of making "proper" improvements to the land (meaning by the white, properties class), in contrast to the stewardship of indigenous communities, who were also constructed as temporally backwards. Ultimately, the moralizing discourse around Black life in San Francisco invalidated Black claims of belonging, and allowed Black bodies and communities to be discarded, not unlike the city's approach to waste products. The logic of development and gentrification effectively naturalizes this displacement as "improvements" to the urban structure.

Life with/as Waste

As this history shows, the city cared little about the outcomes of Fillmore's displaced population, with city planner Kent saying that he had "no pat answer" for where the city could help relocate the district's residents. San Francisco's Black population in the core of the city dwindled after The Fillmore District, which housed a third of the city's Black population, was razed and gentrified in the 1960s and 1970s. This left approximately 12,000 to 20,000 Black residents displaced.[64] Right as construction was about to begin, the city chose to resettle residents

[63] Marisa Solomon, "'The Ghetto Is a Gold Mine': The Racialized Temporality of Betterment," *International Labor and Working-Class History* 95 (2019), https://doi.org/10.1017/s0147547919000024, 77.
[64] Kelley VerPlanck, "Bayview-Hunters Point Area B Survey: Historic Context Statement," San Francisco History, February 11, 2010, https://www.sanfranciscohistory.com/BVHP_Context.pdf, 140

in the temporary post-war housing of Bayview-Hunters Point. The Black bodies that the city displaced to BHP were constructed to be so strongly associated with poverty and moral decay that the city viewed them beyond help. The self-evident solution was thus to treat Black life like any other waste product, and cast it far beyond the gaze of San Francisco's capital's interests.

After San Francisco's Black population was consolidated into one enclave, social and economic constructions of blight, and associations between Black life and waste, intensified. In a 1968 grant application made by the City and County government of San Francisco for the Model Cities Program for the BHP, which provides federal aid to "blighted areas," the city called BHP San Francisco's "dumping ground," in reference to the neighborhoods (Black) public housing residents.[65] An article published by the *San Francisco Chronicle* in 1972 titled "Inside Hunters Point," begins its front page profile of the neighborhood by detailing the "ratty public housing… scruffy bars, and gloomy storefronts," along with the noisy warehouses and construction yards.[66] In 1965, *The Spokesman* reported that "the street cleaning crews are so seldom seen in our neighborhood that one gets the impression that they clean our streets in their spare time."[67]

Bayview-Hunters Point itself was also substantially impacted by white flight: the districts' white population decreased by 59% in the 1960s, and the Black population increased to 69%.[68] Along with the tax base moving away from older, urban areas, the shipyards also began to close down, meaning that there were few jobs and the neighborhood had become a "post-industrial" landscape; it had lost all traces of wartime fortune and prosperity. In 1974, the

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[65] City and County of San Francisco, *Application to the Department of Housing and Urban Development for a Grant to Plan a Comprehensive Model Cities Program: Bayview-Hunters Point Model Neighborhood,* 1968.
[66] Tim Findley, "Inside Hunters Point," *San Francisco Chronicle*, February 14, 1972.
[67] "Rats Run Rampant in Project," *The Spokesman*, October 15, 1965.
[68] Lindsey Dillon, "Race, Waste, and Space: Brownfield Redevelopment and Environmental Justice at the Hunters Point Shipyard," *Antipode* 46, no. 5 (October 23, 2014): 1205–21, https://doi.org/10.1111/anti.12009, 8.

closure of the Naval base, which was the area's biggest employer, coincided with the relegation of San Francisco's Black population to Bayview-Hunters Point. This was in part due to the demolition of the Fillmore District, San Francisco's other historically Black neighborhood, which got targeted for urban renewal in the mid-20th century. James Baldwin termed this act of racial dispossession as "N***o removal,"[69] after a campaign by the San Francisco Chronicle to paint the neighborhood as blighted, diseased, and a slum. Due to the legacies of exclusionary housing policies in the rest of the city, most people displaced from the Western Addition moved into Bayview-Hunters Point, cementing its status as a Black neighborhood.

These "blighted" areas are considered to be discursively separate entities than the city of San Francisco, which strengthens associations of these areas as landfills of bodies, activities, and infrastructure. This separation, however, does not mean that BHP's residents are given autonomy over their social organization. In an 1972 San Francisco Chronicle article titled "Outside's Impact on Hunters Point,"[70] the author details the ways in which all political decisions concerning the neighborhood seem to be enacted by an invisible hand of San Francisco private and public interests, in ways that are totally abstracted from the democratic system of local governance. The specific case discussed in the article is over the construction of a community health clinic, which would be affiliated with the John Hale Medical Society, an all-Black National Medical Association. In talking about these political positions as constructed not by community interests but by outside influence, the article says "it is all merely a trap. An old trap the community has seen before, one that grows out of umbilical allegiances with the outside and captures the 'outside' itself as firmly as it does the poverty-stricken people of the community."[71]

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[69] Rachel Brahinsky, "Fillmore Revisited-How Redevelopment Tore through the Western Addition," San Francisco Public Press, September 23, 2019, https://www.sfpublicpress.org/fillmore-revisited-how-redevelopment-tore-through-the-western-addition/.
[70] "Outside's Impact on Hunters Point," *San Francisco Chronicle* , February 18, 1972.
[71] "Outside's Impact on Hunters Point," *San Francisco Chronicle* , February 18, 1972.

This parental metaphor of the invisible power relations continues, with Hunters Point being referred to as "that stepchild community," with "downtown"[72] making all of the local decisions. In contrast to dominant understandings of waste as "matter out of place,"[73] this shows how the spatial formations of waste are constantly under political management. As Solomon says, "Whiteness not only restricts how people are allowed to move, find, and make value, it also effaces and delimits possibilities for present and futures otherwise."[74] Here, we see more contemporary iterations of the logic of enclosure that dispossessed indigenous peoples from their lands, and how the state has continued its necropolitical regime over racialized others.

In the absence of political power that is wielded for the benefit of the community, and in direct response to the spatial constructions of waste, blight, and abjection, community members and organizations have come together again and again to organize and protest for better conditions. One group in particular, a group of BHP mothers who came together and collaborated with local environmental justice organizations in 1994, kicked off contemporary environmental justice activism on the site by surveying all hazardous waste sites located in Bayview-Hunters Point.

Fighting the Cultural and Political Effects of Waste

Activism currently happening against the toxic remediation and redevelopment of Bayview-Hunters Point can trace its roots to grassroots movements in the 1960s. In response to the discriminatory planning practices in Bayview-Hunters Point, a group of Black women

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[72] "Outside's Impact on Hunters Point," *San Francisco Chronicle* , February 18, 1972.
[73] Mary Douglas, *Purity and Danger: An Analysis of Concept of Pollution and Taboo* (London: Routledge, 1966), 36.
[74] Marisa Solomon, "'The Ghetto Is a Gold Mine': The Racialized Temporality of Betterment," *International Labor and Working-Class History* 95 (2019), https://doi.org/10.1017/s014754791900002, 91.

dubbed the "Big Five" spearheaded grassroots calls for civil rights, affordable housing, environmental justice, healthcare, and more in the area.[75] This activism intensified in the 1970s amidst the broader movement of deindustrialization and resulting job loss in the city; in 1974, the Naval shipyard, which was the city's largest industrial employer, closed, resulting in massive job loss in the area.

Community activists changed their organizing approach to support the broader ecological health of the community, linking campaigns for affordable housing and employment opportunities to health care issues through the creation of the Hunters Point-Bayview Community Health Service, founded in 1967. While the organization focused on health care, it defined "health" in social terms. In the organization's first publication, called the *Hunters Point-Bayview Community Health Service News*, an article asks "What as a matter of fact, constitutes health services? Do we arbitrarily limit ourselves to fixing teeth, healing sick bodies and the like? Or do we perhaps try to get at the root causes of sickness and try to eradicate these causes."[76] The article later uses the case of a young man's depression to pose the question: "what kind of education did he receive?"; "how did his life differ from that of his white contemporary in the Richmond?."[77]

This critical analysis of the domain of what constitutes a "health" issue shows a proto-environmental justice approach to community health and wellbeing. It locates the source of bodily damage not in random or genetically inherited illness, but in the social organization of the

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[75] Dan Brekke, Alex Cherian, and Adam Grossberg, "From the Archive: Bayview-Hunters Point Backs S.F. State Strike, December 1968," KQED, February 10, 2015, https://www.kqed.org/news/10428494/from-the-archive-bayview-hunters-point-backs-s-f-states-student-strike-december-1968.

[76] Arthur Coleman, "The Hunters Point-Bayview Community Health Service," In the Forefront, 1969, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1503440/pdf/califmed00021-0062.pdf.

[77] Arthur Coleman, "The Hunters Point-Bayview Community Health Service," In the Forefront, 1969, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1503440/pdf/califmed00021-0062.pdf.

Hunters Point-Bayview neighborhood, located in the middle of disinvested and wasted landscapes, which produces bodily damage in its Black residents. It expands on this point by comparing a young Black man's mental health to that of a white resident in an adjacent wealthier community, pointing to the uneven development of these two communities that produces harm that can't be captured by physical health assessments, much in the same way technoscientific approaches to contamination can't properly detect toxicity. Moreover, the organization states its mission of getting at "the root causes of sickness and try[ing] to eradicate these causes."[78] This expands approaches to healing the body through medical interventions to improving material conditions like housing, employment opportunities, and other uneven products of racial capitalism.

Grassroots activism shifted to explicitly addressing the industrial built environment and its hazardous products later in the 1970s. Community members came together to protest the expansion of the Southeast Sewage Treatment plant, the city's largest wastewater treatment plant. Continuing into the 1990s and 2000s, grassroots campaigns successfully prevented the creation of a new power plant in the neighborhood and shut down the existing Hunters Point power plant.[79]

In 2006, Lennar, Inc., the developer leading the redevelopment projects of Bayview-Hunters Point, began construction activities, excavating hundreds of thousands of cubic yards of contaminated soil. This will build on the discussion in Chapter 2 of Proposition P and the Navy's remediation timelines This soil passed through the neighborhood's public housing projects on its way to other landscapes designated as landfill on large diesel trucks, and the same

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[78] Arthur Coleman, "The Hunters Point-Bayview Community Health Service," In the Forefront, 1969, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1503440/pdf/califmed00021-0062.pdf.
[79] Joshua Arce, "It Takes a Village... To Close a Power Plant," San Francisco Bay Area Planning and Urban Research Association, January 25, 2011, https://www.spur.org/news/2011-01-25/it-takes-village-close-power-plant.

diesel trucks brought in uncontaminated soils. The airborne particles were a concern for residents, who reported a myriad of health concerns and medical effects such as adult onset asthma, and nausea.[80] There were also concerns around the mobilization of asbestos by construction activities that was otherwise fixed in the serpentinite rock of the site's bedrock.[81] During the early phases of Lennar's construction activities, the company's asbestos monitors repeatedly malfunctioned. However, state agencies like the California Department of Public Health concluded that the dust exposure was not harmful to residents despite community protests.[82] They ignored the cumulative and synergistic impacts of the intrusion of particulate matter into residents' bodies.

This shows how the state legitimized the intentional malpractice of Lennar and neutralized any grounds for lawsuits and medical claims. As a result, "residents had a feeling of disposability and the sense that their lives were put at risk for a development project that was 'not for them,'"[83] showing the experience of redevelopment alienated residents from the beginning. The exposure to construction debris was viewed as a "form of racial violence" by residents, and was viewed as a "second round of deaths,"[84] with the first referring to the intense chemical exposure that NRDL workers suffered. The harmful effects of development were

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[80] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/, 231.
[81] "Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard," City and County of San Francisco, April 2010, https://www.sfdph.org/dph/hc/HCAgen/HCAgen2010/files406012010/Attach3CleanupExecSum.pdf.
[82] "Draft Executive Summary Regarding the Environmental Remediation of the Hunters Point Shipyard," City and County of San Francisco, April 2010, https://www.sfdph.org/dph/hc/HCAgen/HCAgen2010/files406012010/Attach3CleanupExecSum.pdf.
[83] Erin McCormick, "Bayview Revitalization Comes with Huge Price to Black Residents" (SF Gate, January 14, 2008), https://www.sfgate.com/bayarea/article/Bayview-revitalization-comes-with-huge-price-to-3298240.php.
[84] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/, 232.

viewed on par with the radioactive contamination from the NRDL, situating the violence resulting from development in the neighborhood's history of rendering bodies and landscapes disposable.

However, in another case that year, after over a decade of community protests, the Pacific Gas and Electric (PG&E) plant was finally shut down. The PG&E Hunters Point Power Plant had been in operation since 1929 and was one of the United States' largest natural gas and electric utilities. The report found the plant to be the "largest stationary source of air pollution in Bayview Hunters Point, putting out almost 600 tons of pollutants annually into the air over Southeast San Francisco" (8)[85]. Residents had known about the plant's adverse environmental effects for decades, and had been organizing to shut it down since at least the early 1990s. PG&E stated that it would close the plant in 1998 following community protests, however it kept delaying the shutdown. Greenaction and other coalition groups consistently organized protests at Heron's Head Park to shut down the plant in the early 2000s. Marie Harrison, one of Greenaction's primary organizers, stated that "it'll either be champagne [celebrating the closure of the plant] or rocks and chains"[86] Under pressure from the protest and from the extensive damage that the Toxic Inventory mapped, PG&E announced that it would close the plant on May 15, 2006.[87]

In 2011, Greenaction for Health and Environmental Justice held a protest on airborne construction debris at the Bay Area Air Quality Management District's offices. It was led by Tessie Ester, a community leader from Hunters View public housing, who had organized

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[85] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf.
[86] Scarth Locke, "Hunters Point Power Plant Controversy," Bay Nature, April 1, 2006, https://baynature.org/article/hunters-point-power-plant-controversy/.
[87] Leslie Fulbright, "Big Victory for Hunters Point Activists" (SF Gate, May 15, 2006), https://www.sfgate.com/news/article/Big-victory-for-Hunters-Point-activists-As-PG-E-2534998.php.

campaigns against the power plant in the 1990s and 2000s.[88] She brought a group of teenagers from Hunters Point, who were protesting with surgical masks covering their noses and mouths and holding signs that read "Let us live."[89] The protest rejected the technoscientific claims that construction particles were not causing harm to the residents of Bayview-Hunters Point. By covering the nose and mouth, passageways that allow invisible particles to enter the body, the surgical masks mapped and rendered visible the circulation of airborne debris. The call of "let us live" highlighted the embodied experience of living with and through the experiences of disposability and waste.

The masked "let us live" protests show how the terrain of struggle with hazardous but invisible matter is mapped to the body. This is because the body is where the racial and environmental injustices through particle contamination are rendered visible to an actor's Merkwelt, as will be discussed in Chapter 2. This is where the visible dust clouds, when diffused and thus no longer considered a hazard, leave their material impacts. The body elucidates the imperceptible passages that these dissipated, fine dust particles take as they make their way through atmosphere, waterways, trophic levels, and bodies, human and non-human. As seen from calls to "let us breathe," the body is also the site where these struggles are challenged and protested. This discussion of grassroots actions against conditions of toxicity will be picked back up in Chapter 3.

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[88] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/, 233.
[89] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/, 233.

Chapter 2: A Critique of Technoscience's Remediation Logics and Methods

Introduction

This chapter critiques the various technoscientific strategies employed to address the problem of toxic waste on the Hunters Point Naval Shipyard (HPNS) site, so that it can be redeveloped. The plan for remediation and redevelopment was negotiated by the City of San Francisco, the Redevelopment Agency, and the Navy, in 2004. The Conveyance Agreement, between these three organizations, "obligates the Navy to remediate hazardous materials on the Shipyard to levels consistent with the land uses designated in the original redevelopment plans for the Shipyard Redevelopment Plan as adopted in 1997 and to convey parcels to the Agency at no cost on a phased basis as the Navy successfully completes the remediation."[90] The hazardous materials referenced are nuclear and toxic waste from military and industrial use, including radionuclides, PCBs, petroleum fuels, pesticides, and heavy metals, which are found in soil, dust, sediments, surface water, and groundwater.[91]

The actors involved in the remediation process have autonomy to shape knowledge production about the site and toxic contamination, forming a narrow regime of perceptibility. The regime of perceptibility is defined as "the way a discipline or epistemological tradition

[90] "Hunters Point Shipyard Area Plan," San Francisco Planning Commission, August 3, 2010, https://generalplan.sfplanning.org/Hunters_Point_Shipyard.htm.
[91] "Superfund Site: Hunters Point Naval Shipyard," United States Environmental Protection Agency, n.d., https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0902722#:~:text=NRDL%20activities%20contaminated%20soil%2C%20dust,compounds%20(VOCs)%20and%20radionuclides.

perceives and does not perceive the world."[92] This shapes what facets of the condition of toxicity are addressed, and through what tools. For example, the strategies discussed below focus primarily on mitigating the damage of individual harmful molecules, rather than addressing the power structures that located noxious industries in BVHP, or ensuring that remediation jobs went to community residents.

Over the course of the chapter, I argue for reconceptualizing our understanding of the environment as being indeterminate. At a fundamental level, remediation strategies are bound to fail because their goal—which is to return the site to its pre-industrial condition—ignores the ways in which chemicals have already been integrated in a multitude of ways into the environment. This is not a wholesale rejection of remediation, but an argument to shift the way we view the temporality of remediation and its goals. This understanding is important as it shapes human relations with and responses to toxicants in our environments. This argument undergirds my critique of the issues of fraud and corruption related to the remediation process, which I understand as a political and historical material problem, and my critique of the conceptual and tangible tools employed in the remediation process, which I frame as an ontological-epistemological problem. Finally, I use Jakob von Uexkull's theory of *Umwelt*, which describes the epistemological disjuncture between an actor's perceptual and effector worlds, to theorize and advocate for an understanding of our environment as being indeterminant.

Hunters Point Naval Shipyard Site Overview and History

[92] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.

The Shipyard sits on a peninsula comprised of 490 acres of land and 5 miles of shoreline, in the southeast corner of San Francisco. Most of its land is fill, which early construction moved from the area's early elevated topography to create the peninsula. The site itself has over 135 buildings, mostly from the World War 2 era.[93] The only currently-occupied areas are a 7-building complex which is home to 300 artist studios, and an industrial kitchen where various food trucks and small businesses make and prepare their foods. The peninsula is bordered by the Hunters Point neighborhood, which has a primarily Black, Latinx, and more recently, Asian American and Pacific Islander, demographic.

Beyond the contaminants from adjacent industrial activities in BHP covered in Chapter 1, the shipyard itself has been a tremendous source of toxic contamination, which is tied to its importance as a site of developing U.S. military and nuclear power. Contamination is in part due to shipbuilding activities on the site, where the Navy-owned shipyard serviced over 200 vessels to be used in the Pacific Theater, and nuclear testing activities like, for example, its role in the assemblage and shipment of the "Little Boy" atomic bomb which was detonated over Hiroshima.[94] The three main sources of nuclear contamination on the site were the use of radioluminescent materials in ship repair, experimentation involving Operation Crossroads, and activities from the Naval Radiological Defense Laboratory (NRDL). Radioluminescent materials that were used in HPSN contained harmful substances such as radium, strontium, and promethium, however, because these materials were regarded as industrial instead of radioactive

[93] "Hunters Point Shipyard Area Plan," San Francisco Planning Commission, August 3, 2010, https://generalplan.sfplanning.org/Hunters_Point_Shipyard.htm.
[94] United States Department of the Navy, "Hunters Point Shipyard Final Historical Radiological Assessment: History of the Use of General Radioactive Materials 1939–2003" (2004), https://www.bracpmo.navy.mil/content/dam/bracpmo/california/former_naval_shipyard_hunters_point/pdfs/all_documents/environmental_documents/radiological/hps_200408_hra.pdf.

sources, they did not requires special licensing and thus were disposed of in landfills and drainage systems, often on site.[95]

The shipyard also served as the domestic base for Operation Crossroads, which refers to the nuclear tests conducted by the United States military at Bikini Atoll in 1946. This operation involved detonating two atomic bombs near almost one hundred ships to test radiological effects on military equipment. These ships were then often towed back by support vessels. Decontamination methods were tested at the shipyard on both target vessels and support vessels in Operation Crossroads; target vessels underwent a more thorough waste management process (which typically meant packaging nuclear waste into steel drums and dumping it in the Pacific ocean), while the waste management process of support vessels was typically unregulated, meaning that it could have been disposed of on site.[96]

Finally, the NRDL tested the effects of radiation, and developed decontamination methods, radiological protection equipment, and radiation detection instruments.[97] The lab handled and disposed of nuclear waste from the Lawrence Livermore Laboratory at University of California, Berkeley, and its own "low-level radioactive waste," by packaging it into steel drums and dumping it in the Farallon Islands off of the coast of San Francisco.[98] It is estimated that by 1959, 47,500 barrels of waste containing 13,500 curies of radioactivity were dumped.[99] While the NRDL's Health Physics Division oversaw nuclear disposal activities in accordance with

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[95] U.S. Navy, "Hunters Point Shipyard Final Historical Radiological Assessment," 6-26—6-29.
[96] James Delgado, "After Crossroads: The Fate of the Atomic Bomb Target Fleet," *Journal of Maritime Archaeology* 11, no. 1 (April 2016): 25-31, https://doi.org/10.1007/s11457-016-9154-7.
[97] Lindsey Dillon, "Crossroads in San Francisco: The Naval Radiological Defense Laboratory and Its Afterlives," in *Inevitably Toxic: Historical Perspectives on Contamination, Exposure, and Expertise*, eds. Brinda Sarathy, Vivien Hamilton, and Janet Farrell Brodie, (Pittsburgh, PA: University of Pittsburgh Press, 2018), 86–89.
[98] Lisa Davis, "Fallout" *SF Weekly*, May 2, 2001, https://archives.sfweekly.com/sanfrancisco/fallout/Content?oid=2141567.
[99] Lisa Davis, "Fallout" *SF Weekly*, May 2, 2001, https://archives.sfweekly.com/sanfrancisco/fallout/Content?oid=2141567.

Atomic Energy Commission (AEC) guidelines, records show that waste may have been dumped in the shipyard landfill or burned in the shipyard incinerator.[100] Moreover, changing regulations around radiological standards meant that decontamination of older buildings were not done to standards we have today—in 1955, buildings were decontaminated to a gamma contact dose rate of less than 1.8 millirem per house, and when the NRDL closed in 1969, this standard was at less than .2 millirem per hour.[101]

The site was shut down in 1974. In 1980, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) forced the Navy to conduct an assessment of hazardous pollutants on the site—their initial survey found 6,000 pounds of materials containing radium paint in the shipyard landfill, which made the Environmental Protection Agency (EPA) designate the site as a Superfund site in 1989.[102]

The remediation strategies employed are carried out by various actors: the Navy, as the property owner, is in charge of overseeing the remediation process; contractors such as Tetra Tech Inc. are responsible for the actual remediation work; Lennar and Five Points, the primary developers of the site, are responsible for most construction activities; the City of San Francisco is overseeing the remediation and redevelopment work on the government side; and state and federal regulatory agencies, such as the EPA, California Department of Toxic Substances Control

[100] Kevin Chen, "Radiological and Redevelopment History of Hunters Point and Treasure Island Briefing Book," Racial Justice in the Nuclear Age, n.d., https://nuclearbayarea.home.blog/radiological-history-of-hunters-point-and-treasure-island-briefing-book/#_ftn7.

[101] Kevin Chen, "Radiological and Redevelopment History of Hunters Point and Treasure Island Briefing Book," Racial Justice in the Nuclear Age, n.d., https://nuclearbayarea.home.blog/radiological-history-of-hunters-point-and-treasure-island-briefing-book/#_ftn7.

[102] United States Department of the Navy, "Initial Assessment Study of Hunters Point Naval Shipyard (Disestablished) – San Francisco, California," (October 1984), https://www.bracpmo.navy.mil/content/dam/bracpmo/california/former_naval_shipyard_hunters_point/pdfs/all_documents/environmental_documents/radiological/1984_HPNS_Initial_Assessment_Study_Disestablished)_Report.pdf.

(DTSC), California Department of Public Health (CDPH), and the Regional Water Quality Control Board (RWQCB), are in charge of regulating the remediation work.[103] What is noticeably missing from this list are community groups, whose voices have been ignored and silenced since the passing of Proposition P in 2000. These actors all have separate responsibilities in the remediation and redevelopment process, however, their degree of allegiance to their respective constituencies is often shaped by forces of capital accumulation.

Technoscience and Capital Accumulation

The Navy and their remediation contractors take a one-dimensional technoscientific view towards sensing, measuring, and remediating toxic chemicals. I use the term technoscience in this chapter as a "distortion of pure science resulting from its contamination by ideology,"[104] often in reference to its perversion by power and capital. Michelle Murphy, in "Alterlife and Decolonial Chemical Relations," posits that one of the primary technoscientific epistemic habits related to studies of chemical exposures is the portrayal of chemicals as discrete objects, which is enforced by naming techniques and abstract structural diagrams.[105] The ontological definition of chemicals as discrete objects is often used by state and private actors to avoid addressing the extensive chemical relations that have been embedded in broader ecological systems (implicating humans, animals, and plants). The consequences of contamination and incomplete remediation are thus often structurally externalized, as I will discuss in examples throughout this chapter.

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[103] Kevin Chen, "Radiological and Redevelopment History of Hunters Point and Treasure Island Briefing Book," Racial Justice in the Nuclear Age, n.d., https://nuclearbayarea.home.blog/radiological-history-of-hunters-point-and-treasure-island-briefing-book/#_ftn7.

[104] Bernadette Bensaude-Vincent and Sacha Loeve, "Toward a Philosophy of Technosciences," *French Philosophy of Technology: Classical Readings and Contemporary Approaches*, May 2018, 169.

[105] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02, 495.

More broadly, this understanding fundamentally restricts remediation to the realm of the chemical and doesn't attempt to address the disinvestment and legacies of segregation in the communities around the shipyard, which will discuss in Chapter 2

This technoscientific understanding of chemicals allows the Navy to claim that it can comprehensively detect and measure the extent of the damage of industrial chemicals, however, there have been many fraud allegations related to measuring chemicals on the site. Remediation progress on the site is driven by real estate speculation and developers. The contradictions between chemical remediation and profit-driven development are illustrated in the case of the Navy's environmental remediation partner, Tetra Tech Inc. This company was renowned for heading environmental remediation on brownfield and Superfund sites all over the country, and was paid $1 billion dollars for its work on Hunters Point. However, whistleblowers leaked information that the contractor ordered workers to destroy post-cleanup soil samples with some of the highest radioactivity levels and replace them with soil readings from other areas, and even ordered its workers to avoid some radioactive hotspots altogether.[106] Currently, two Tetra Tech Inc. supervisors have pleaded guilty to charges of falsifying samples,[107] and a $6.3 million settlement has been approved between the developers and 350 homes specifically impacted by the case.[108] However, this latter lawsuit did not implicate Tetra Tech specifically, and multiple

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[106] Matthew Renda, "Cleanup Firm Can't Duck Whistleblower Case Involving Irradiated Shipyard," Courthouse News Service, October 22, 2020, https://www.courthousenews.com/cleanup-firm-cant-duck-whistleblower-case-involving-irradiated-shipyard/.

[107] Nicholas Iovino, "Judge Likely to Approve Settlement over Shipyard Cleanup Fraud," Courthouse News Service, October 14, 2021, Matthew Renda, "Cleanup Firm Can't Duck Whistleblower Case Involving Irradiated Shipyard," Courthouse News Service, October 22, 2020, https://www.courthousenews.com/cleanup-firm-cant-duck-whistleblower-case-involving-irradiated-shipyard/.

[108] Nik Wojcik, "Judge Approves $6.3 Million Settlement for Hunters Point Homeowners over Toxic Waste Claims," SF Bay, April 1, 2022, https://sfbayca.com/2022/04/01/judge-approves-6-3-million-settlement-for-hunters-point-homeowners-over-toxic-waste-claims/.

lawsuits and legal and federal cases are still ongoing. The values driving the cleanup were not to guarantee the health of the area's residents and land–which would have required decades of testing and cleanup and had a strong community engagement component–but to clean up the area as fast as possible so it could be redeveloped.

This fraud is not an exception but a direct result of a history of corporate lobbyists demanding corporate-produced data to be used in chemical exposure research,[109] which gives room to private companies like Tetra Tech to take advantage of federal contracts (and their technoscientific understanding of exposure limits and contamination) to not meet the qualification of a cleanup (which are unknown when it comes to chemicals like radionuclides). This story is similar to a nuclear site cleanup that happened at the Rocky Flats Plant in Colorado, where the environmental remediation contract was incentives-based and had fixed prices, cleanup completion dates, and legally-compliant risk levels (Krupar 307). In this case, the fixed characteristics incentivized the contractor to finish the cleanup decades before the deadline to reap millions in benefits, severely sacrificing the extent of cleanup on the site. It is important to note that the Tetra Tech fraud was exposed a decade after community organizations had their calls for retesting ignored, and indicates the poor quality of regulatory oversight by government agencies. This fraud case ultimately shows the fallibility of chemical exposure testing when driven by/in the realm of capitalist-market relations. As I will discuss in Chapter 3, market relations are as integral to understanding toxic assemblages and the mobilities to toxic molecules.

Ontology, Epistemology, and Remediation

[109] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02, 495.

Technoscience actors take their measurements for a truth in order to meet certain development deadlines and to cut costs, which allows the Navy to make claims of being able to "clean up" the chemicals, whether that be in the form of removal or burial. This claim is problematic, as the Navy is unable to police boundaries between chemical remains and people. Any attempt to capture and "solve" the fullness of the industrial chemical networks from the site would have to draw a line at some scale, being, or ecological process.

In addition to environmental remediation contractors and the Navy, state entities like the San Francisco city government also have a history of sacrificing remediation for accelerated redevelopment. In 2000, BHP residents pushed back on the Navy's environmental remediation plans over concerns about the degree of cleanup. Federal law states that owners of Superfund sites, in addition to the EPA, must take into account community viewpoints related to their land management. City supervisors thus crafted Proposition P, which "specifically rejected physical barriers like durable covers, calling for the Navy to 'clean the Shipyard to a level that will enable unrestricted use,' in accordance with residents' wishes."[110] Proposition P passed in November, 2000, with 86% of the vote in favor, and has been San Francisco law since.

In 2006, however, Gavin Newsom, then-mayor of San Francisco, had conflicting interests to the no-compromise remediation plan. The San Francisco 49ers at the time were considering leaving the city, so Newsom's administration proposed building a new football stadium in the Superfund site of BHP to keep them in San Francisco, which required the demolition of the Candlestick Stadium in BHP. This would require an acceleration of the remediation process, so that land could be transferred to the city faster in order to meet the team's deadlines. In February

[110] Jason Fagone and Cynthia Dizikes, "Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," San Francisco Chronicle, August 14, 2019, https://www.sfchronicle.com/bayarea/article/Report-Navy-altered-Hunters-Point-cleanup-to-14302320.php#photo-18070666.

2007, the mayor's head redevelopment staff, Michael Cohen, sent a memo to the Navy, EPA, and state regulators claiming that the existing cleanup policies were "unreasonable burdens on development," and argued that a "cover remedy"[111] would make sense for the parcels that the city was interested in developing into a stadium. During this time, a leaked memo from the city's Department of Public Health argued to "stall some cleanup efforts in order to kick start the redevelopment in a few small areas."[112] The memo acknowledged that this stance was "seemingly contrary to the traditional public health and environmental" mission of the department, but attempted to frame this policy as an enhancement of public health due to the "generation of jobs, housing, and other opportunities that allow for improvement in quality of life."[113]

Candlestick Stadium was slated for demolition as a part of the redevelopment plans for Bayview-Hunters Point. Lennar's original plan, approved by the San Francisco City Planning Commission in 2010, was to do a manual tear down of the stadium for public and environmental health reasons. However, just prior to the demolition date, Lennar changed its plans to instead explode the stadium, which would be far cheaper and quicker; the San Francisco City Planning Commission added an addendum to the original Environmental Impact Report (EIR) that

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[111] Jason Fagone and Cynthia Dizikes, "Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," San Francisco Chronicle, August 14, 2019, https://www.sfchronicle.com/bayarea/article/Report-Navy-altered-Hunters-Point-cleanup-to-14302320.php#photo-18070666.

[112] Jason Fagone and Cynthia Dizikes, "Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," San Francisco Chronicle, August 14, 2019, https://www.sfchronicle.com/bayarea/article/Report-Navy-altered-Hunters-Point-cleanup-to-14302320.php#photo-18070666.

[113] Jason Fagone and Cynthia Dizikes, "Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," San Francisco Chronicle, August 14, 2019, https://www.sfchronicle.com/bayarea/article/Report-Navy-altered-Hunters-Point-cleanup-to-14302320.php#photo-18070666.

approved this new method.[114] Asbestos and lead paint were known issues in the EIR report, in addition to silica dust from concrete which is linked to respiratory issues. Lennar had abatement plans to remove these materials, however, there was still the risk of traces of the material remaining on the site before the explosion.[115] In public meetings and the EIR report, Lennar advertised this method as a "controlled implosion," and presented diagrams that showed the dust from the explosion being neatly contained within the stadium and its parking lot under still conditions.[116] In the diagram of dust distribution under windy conditions, the heavier particles are still depicted as remaining within the stadium, being supposedly contained by Lennar's invisible property lines. The diagram also states that the "fine dust impact area will vary with wind speed and conditions." The projected pattern of wind in the windy conditions model shows the wind coming from the west, distributing the fine dust into the bay. [117]

However, residents countered this claim, saying that winds move "erratically and in circles" around the stadium, earning the stadium nicknames such as "Windlestick."[118] This meant there was no possible way for Lennar to fully control the debris from the explosion. Moreover, the diagram, which presents a birds-eye image of the stadium, totally erases any evidence of human activity from the site and its surroundings, and fails to meaningfully capture the circulation of dust as it interacts with the environment around the site. The EIR report also heavily focuses its air quality impact discussions around decreasing the volume of visible dust,

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[114] Lindsey Dillon, "The Breathers of Bayview Hill: Redevelopment and Environmental Justice in Southeast San Francisco," *Hastings Environmental Law Journal* 24, no. 2 (2018), https://repository.uclawsf.edu/hastings_environmental_law_journal/vol24/iss2/2/, 228.
[115] Stephanie Chuang and Jean Elle, "'Developers Don't Live Here:' SF Resident on Demolition of Candlestick Park," NBC Bay Area, January 6, 2015, https://www.nbcbayarea.com/news/local/developers-ddont-live-here-sf-resident-on-demolition-of-candlestick-park/115727/.
[116] Lindsey Dillon, "The Breathers of Bayview Hill," 235.
[117] Lindsey Dillon, "The Breathers of Bayview Hill," 235.
[118] Lindsey Dillon, "The Breathers of Bayview Hill," 235.

which has no impact on the dust's health or environmental effects. This indicates that Lennar was primarily focused on the visual aesthetics of the explosion rather than mitigating its material effects.

The new 49er's stadium plan was never initiated. However, the city kept on advocating for an accelerated cleanup timeline, in order to enable development to start earlier. The Navy thus reversed its original policy of attaining the highest level of cleanup on the site in favor of placing a cap on top of contaminated soil areas in some parcels. The case of the construction of the stadium and the decision to allow barriers on the site illustrates how the technoscientific methods of remediation are strongly dictated by state actors, who are as prone to prioritizing economic development over lives and ecosystems as private actors. Proposition P, which disallowed the use of barriers to contain pollutants in the soil, is currently still active legislature. However, the mayor's office completely bypassed the legislature to prioritize its own private interests of building a stadium. Moreover, the system of voting that instituted the Proposition was directly the result that grassroots activists and residents wanted as it was passed through a referendum, and not through an abstraction of representation and governance.[119] It is thus dangerous to put faith in the Navy's claims that the site would be "scrubbed to the highest standards, essentially returned to its state before Cold War nuclear waste and industrial shops tainted the land."[120] In place of a long-term comprehensive remediation program, the construction of the stadium would generate jobs, income, and tax revenue for the city, on land

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[119] "Proposition P - Hunter's Point Shipyard Remediation," San Francisco Bay Area Planning and Urban Research Association, November 2000, https://www.spur.org/publications/voter-guide/2000-11-01/proposition-p-hunters-point-shipyard-remediation.

[120] "Report: Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," Committee To Bridge The Gap, August 19, 2019, https://www.committeetobridgethegap.org/2019/08/14/report-navy-altered-hunters-point-cleanup-to-cover-not-remove-toxic-soil/.

that is currently viewed as a wasted landscape. This provides many incentives for the city to accelerate cleanup. In addition, stadiums are shown to have a positive impact on surrounding land prices,[121] which would increase the tax revenue of the area while also increasing home/rent burdens.

The example of the football stadium can be viewed as a small-scale analogue to the city and developers' approach to the entire shipyard site, and affirmed my claim that it is important to approach remediation on the site oriented towards its indeterminacy. This is especially important to consider in the light of the EPA's announcement that HPNS cleanup will not be comprehensive enough to allow unrestricted residential use, which is a violation of Proposition P.[122] Instead, they will use caps and land use restrictions to accelerate the cleanup process. This raises the question of how, when state actors, regulatory agencies, and developers all prioritize neoliberal principles of economic development, we can ensure that environmental remediation efforts truly attempt to increase the health of ecosystems and lives, both human and nonhuman? At the same time, it points us toward related questions of strategy and ontological definition.

For example, the failure of the primary strategy of burial lies in the technology itself. In the case of Parcel E-2, which existed as a landfill when the site was productive, contains the highest levels of radiation among the parcels being remediated. The Navy settled on Remedial Alternative R-2, which entailed an excavation of debris and sediments exceeding regulatory contamination levels within one foot of the surface. In its place, they constructed a two feet deep soil layer, which would theoretically fix the radiation in place and prevent human exposure, and

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[121] Amber Wyatt, "Do Sports Stadiums Raise Residential Values: The Case of Banc of California Stadium," California State Polytechnic University, Pomona, 2020, https://scholarworks.calstate.edu/downloads/hq37vq792?locale=en.

[122] Jeff Ruch, "EPA Says Hunters Point Will Never Be Fully Cleaned," Public Employees for Environmental Responsibility , October 5, 2022, https://peer.org/epa-says-hunters-point-will-never-be-fully-cleaned/.

used Institutional Controls in the form of land use regulations to restrict human activities on the parcel (The Navy, Parcel E ROD). In other parcels, a contamination barrier could be four inches of asphalt or infrastructure that is already present on the site. However, reports detail that the soil beneath many structures had not been tested for contamination.[123]

Yet the strategy to bury is rendered legible as cleanup because it relies on the ontological separation between the surface, and the subsurface, which is a landscape beyond the visual sphere of human relations and is therefore considered wholly an externality, as seen in the diagram discussed in the Candlestick Stadium case study. Contrary to this surface-subsurface ontological separation, burrowing animals and plant roots still reach this depth and are heavily contaminated. Studies by the University of California show that many common garden plants have roots that can extend to depths more than 2 feet, which could concentrate contaminants in the plant body, and eventually be ingested by humans and other animals.[124] Some plants are so effective at concentrating and pulling contamination from the ground that they are used for a remediation process called "phytoextraction" on polluted sites. Others, called "hyperaccumulators," show a preference for specific chemicals, like radium-226 for Oak trees.[125] which is found on the site.[126] Many such plants are being planted in Parcel E and E-2, which will become public parks. Parcel A, where vegetation has already been planted, has a number of deep-rooted plants, which are also slated to be used as vegetation for the rest of the parcels.[127]

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[123] CP Development Co., "Risk Management Plan," n.d.
[124] "Tips on Irrigating Vegetables," University of California Agriculture and Natural Resources, n.d., https://sfp.ucanr.edu/pubs/Family_Farm_Series/Veg/Irrigating/.
[125] Daniel Hirsch et al., "From Cleanup to Coverup," Committee To Bridge The Gap, August 2019, https://www.committeetobridgethegap.org/hunters-point-reports/FromCleanupToCoverup.pdf, 14.
[126] Dennis J. Paustenbach and Robert D. Gibbons, "Radiological Risk Assessment of the Hunters Point Naval Shipyard (HPNS)," *Critical Reviews in Toxicology* 52, no. 7 (August 9, 2022): 499–545, https://doi.org/10.1080/10408444.2022.2118107.
[127] San Francisco Redevelopment Agency and Lennar/BVHP, "Hunters Point Shipyard Parcel A Phase 1 Open Space, Schematic Design," n.d.

Even plants that do not fall under these categories are able to concentrate contaminants in their bodies through upward gradients. As plants deplete a section of the soil of materials, a pressure and concentration gradient is created, which forces soluble materials from adjacent soil sections towards the roots. This could bring contaminants that are buried deep beneath root zones into the plant body. Once these contaminants are in the plant body, they will eventually die and decompose, forming the soil's surface layer; this negates the entire utility of the soil cover, by exposing contaminated soil to wind and rain, which could disperse it into water systems. Plant stomata are also shown to potentially release gasses during transpiration, including H-3 and Rn-222, which is radium-226's breakdown product and is extremely harmful to human health, both of which are radionuclides found at the HPNS.[128][129]

The anthropocentric and epistemological separation between surface and subsurface ignores fundamental ecological processes which allows this contamination to continue occuring. For example, burrowing animals are also shown to transport soil from beneath soil cap covers to the surface, with studies showing that "bioturbation is the most likely explanation for the frequent and widespread discovery of radiological contamination on surface soils."[130] In addition, some animals feed on decaying organic matter, which may be contaminated due to the processes outlined above. These factors could bring contamination into the terrestrial food web.

Moreover, ecological shifts driven by climate change and techno-natural processes are always shifting site conditions, destabilizing the controlled conditions that the "clean up" is

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[128] B. G. Lewis and M.M. MacDonell, "Release of Radon‐222 by Vascular Plants: Effect of Transpiration and Leaf Area," *Journal of Environmental Quality* 19, no. 1 (January 1990): 93–97, https://doi.org/10.2134/jeq1990.00472425001900010012x.

[129] "Methods for Estimating Fugitive Air Emissions of Radionuclides from Diffuse Sources at DOE Facilities," Eastern Research Group, Inc., September 3, 2004, https://www.epa.gov/sites/default/files/2015-05/documents/final_report_9_04.pdf.

[130] K. Shawn Smallwood, Michael L. Morrison, and Jan Beyea, "Animal Burrowing Attributes Affecting Hazardous Waste Management," *Environmental Management* 22, no. 6 (November 1, 1998): 831–47, https://doi.org/10.1007/s002679900151.

oriented around. The shipyard is located directly between active fault lines, with the United States Geological Survey finding that the site was extremely vulnerable to liquefaction.[131] Erosion through wind and rain could also eventually penetrate the soil cover. The designers of these remediation methods work within the frame of Newtonian time, which refers to technologies that are premised on the Newtonian principles of "decontextualization, isolation, fragmentation, reversible motion, abstract time and space, predictability, and objectivity."[132] The application of technologies under Newtonian time allows the site to be rendered as static and totally fragmented from the surrounding landscape and landscape processes. However, these contextual processes, such as atmospheric and subterranean processes for example, do not abide by human boundaries such as the wired fences installed along the site.

These factors have led the California Department of Fish and Wildlife to disagree with the Navy's claim that the soil cover and Institutional Controls used on the site could prevent the spread of contamination in, filing disagreements in 2013 and again in 2018. They called for the Navy to provide evidence supporting the claim that covers and ICs could contain pollutants, which the Navy refused to provide.[133]

The Navy believes that the contamination covers will be long lasting due to the mechanism of the Institutional Control (IC), however, ICs have to be violated in order for redevelopment activities to begin on HPNS. The primary IC which protects the covers prevents: "excavation of soil; construction of roads, utilities, facilities, structures, and appurtenances of any kind; demolition or removal of 'hardscape' (for example, concrete roadways, parking lots,

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[131] "Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database," *Geology, Minerals, Energy, and Geophysics Science Center*, 2000, https://doi.org/10.3133/ofr00444.
[132] Brett Milligan, "Accelerated and Decelerated Landscapes," Places Journal, February 2022, https://placesjournal.org/article/accelerated-and-decelerated-landscapes/?cn-reloaded=1.
[133] U.S. Navy, "ROD for Parcel E," Attachment 5, 39-40.

foundations, and sidewalks); any activity that involves movement of soil to the surface from below the surface of the land."[134] This IC is ultimately a prohibition on any activities that could disturb the land, which is both essential to preserving the land covers, as well as to the redevelopment of the site. Lennar, the site's developer, acknowledges this prohibition, as they have created the Risk Management Plan (RMP) that allows them to bypass these ICs.[135] Breaking the soil and other covers during development construction will undo virtually all remediation efforts by the Navy, and put both Bayview-Hunters Point residents and construction workers at severe risk of exposure to industrial and nuclear chemicals. The level of cleanup that will have taken place on the site will be marginal by the time redevelopment has been completed. The Navy has violated Proposition P by instead switching its remediation strategy to a combination of ICs and contamination covers. Once the Navy passess off HPNS parcels to the city for development, these ICs will be violated and land disturbing activities will be permitted, destroying the already-porous covers. This illustrates the negligence of the wide spectrum of actors involved in BHP's remediation, as the ICs are already ineffective due to the reasons discussed earlier in Chapter 1, however, even these low standards for remediation are allowed to be systematically violated.

Once the Navy completes its remediation process, it will pass the land off to the City of San Francisco to be developed. This approach fundamentally discretizes the remediation process, splitting the temporality of the landscape into pre- and post-remediation. The RMP will allow developers to also perceive and treat the land as if it were fully-already remediated, rather than approaching remediation of the chemical assemblages on the site as an ongoing process. Developers are allowed to break down and move structures that were otherwise being used as a

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[134] John Ernest Weaver, *Root Development in the Grassland Formation* (McGraw-Hill, 1927).
[135] CP Development Company L.P., "Risk Management Plan Hunters Point Naval Shipyard Revision," 1.

contamination cover, despite the soil underneath many buildings and infrastructure being untested for contamination levels. Soil underneath these structures will only be required to be screened if it is visibly "unnaturally" colored, or exhibited a "chemical" odor.[136] In a regulatory review of the RMP, the USEPA commented that "visual and olfactory indications, while useful, will not indicate the potential presence of all COCs, notably metals and polychlorinated biphenyls (PCBs)... In addition, in the beginning stages of foundation removal, it would be difficult to see staining and detect chemicals by smell until after enough foundation was removed to expose soil, at which point, contaminated dust may have already been dispersed."[137] In response, the RMP addressed the comment with "comment noted," taking no further action.[138] After a second comment from the EPA, the developer (CP) responded that OCII and Fivepoint will "assume that once a parcel has transferred, all investigation and remediation necessary to be protective of human health and the environment, including conditions beneath building foundations, has been conducted to the satisfaction of FFA Signatories."[139] The Navy has switched its remediation strategy from a comprehensive cleanup to the installation of covers and ICs, which assumes that these measures will remain for as long as there is industrial and radioactive contamination in the ground. Not only will the cover and ICs get disrupted for the reasons listed above, but this remediation approach allows developers to make the base assumption that the site is remediated upon transfer to the city, allowing them to bypass further screenings of sites that have never been screened before. The new temporality that the site enters post-Navy ownership will have disastrous consequences for BHP's current residents, as understanding the site as having been returned to its pre-contaminated state will further erase the

[136] CP Development Co., "Risk Management Plan," p. 4-1 - 4-2.
[137] CP Development Co., "Risk Management Plan," Appendix J: p. 26.
[138] CP Development Co., "Risk Management Plan," Appendix J: p. 26.
[139] CP Development Co., "Risk Management Plan," Appendix J: p. 26.

ongoing assemblages of chemical infrastructures and their impact on bodies and landscape systems.

In addition, a civil grand jury came together to investigate whether rising sea levels would increase the level of shallow groundwater underneath the site, which would mobilize pollutants that the Navy says are "stabilized" and contained in the ground. Not only did the research and experts they consulted back this assertion, they also learned that climate change was not taken into account by the Navy, City, or regulatory agencies.[140] This has prompted community environmental organizations, cultural organizations, and community scientists to sign a letter to the city calling them to heed the Civil Jury's recommendations. The two recommendations singled out in the letter itself are to "conduct a total, comprehensive cleanup and removal of all, not some, radioactive and toxic contamination - no capping of contamination," and to "require new, comprehensive, and independent retesting of the entire Shipyard and adjacent areas, with community oversight."[141]

These recommendations, directed from below, called for either the complete clean up or removal of toxic contaminants from the Shipyard. The call against capping indicates an understanding of the ways pollutants could potentially still circulate through our ecosystem despite being "fixed" in the subsurface. The call for total treatment is important, as it will make much stronger progress on getting chemicals out of the ecosystem than is being made. But it

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[140] "Buried Problems and a Buried Process: The Hunters Point Naval Shipyard in a Time of Climate Change," City and County of San Francisco Civil Grand Jury, June 14, 2022, https://civilgrandjury.sfgov.org/2021_2022/2022%20CGJ%20Report_Buried%20Problems%20and%20a%20Buried%20Process%20-%20The%20Hunters%20Point%20Naval%20Shipyard%20in%20a%20Time%20of%20Climate%20Change.pdf.

[141] Adams Rivera, "Letter from Bayview Hunters Point Community and Environmental Justice Groups to San Francisco Board of Supervisors Calling for Full Cleanup of All Radioactive and Toxic Waste," Greenaction, September 16, 2022, https://greenaction.org/2022/09/16/letter-from-bayview-hunters-point-community-and-environmental-justice-groups-to-san-francisco-board-of-supervisors-calling-for-full-cleanup-of-all-radioactive-and-toxic-waste-at-hunters/.

ultimately echoes the epistemic failing of technoscientific methods of waste management, and diverts attention away from the root causes of toxic life, as I will discuss in Chapter 3. The second call, to remove, further externalizes the costs of toxic waste to distant, invisible, offsite landfills, primarily located on the land of the Nation of the Skull Valley Goshute.[142] These recommendations are guided by a commitment to racial and ecological justice and anti-capitalism, just as the intervention I seek to pose is. The technoscientific scope of these stances are thus more indicative of the regimes of perceptibility shaping our understanding of and responses to chemical contamination, in addition to there there being a lack of language and social understanding of the fullness of the chemical relations that we are enmeshed in. As I will discuss in Chapter 3, while new grassroots campaigns still call for complete remediation and removal, current campaigns are extending the scope of the causes of toxic violence to the forces of racial capitalism, and are developing strategies to navigate the already-toxic landscape, providing the blueprint for a new conceptualization of a toxic politics.

Going back to the Tetra Tech Inc. fraud case, after the whistleblowers leaked the accusation of falsifying post-cleanup radiation results, the Navy recommended retesting for 15% of Parcel B. The EPA, DTSC, and CDPH in a subsequent audit, however, found signs of falsification, data manipulation, and quality concerns that implicated an additional 76% of units, which meant that 90% of the survey units in Parcel B were suspect.[143] A similar trend happened in Parcel G, with the Navy recommending 49% of survey units to be retested, but state and federal regulatory agencies found that another 49% needed to be retested, bringing the total to

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[142] Lindsey Dillon, "Race, Waste, and Space: Brownfield Redevelopment and Environmental Justice at the Hunters Point Shipyard," *Antipode* 46, no. 5 (October 23, 2014): 1205–21, https://doi.org/10.1111/anti.12009, 14.

[143] Daniel Hirsch et al., "From Cleanup to Coverup," Committee To Bridge The Gap, August 2019, https://www.committeetobridgethegap.org/hunters-point-reports/FromCleanupToCoverup.pdf, 30.

97%.[144] Recent retesting plans have also shown serious flaws, as seen in the case of the California Department of Public Health using scanning devices that were unable to detect contamination at levels that required remediation.

However, even the more rigorous federal audit doesn't account for new research that counters that there exists a lower threshold of the deterministic effect of certain industrial chemicals, suggesting that even extremely low doses of radiation can have negative effects.[145] These measurements also don't account for the larger web of chemical relations that extend into groundwater supplies and people's bodies. Constraints around radiation remediations are also relaxed in the case of Parcel E-2, which is to become a wildlife refuge, where there is greater allowable contamination due to the limited human contact, which also calls into question who (what beings) chemical remediation is for (question can also be understood as: in what beings is radiation rendered legible). This question reinforces the current ontological separation between the surface and substrate seen in the remediation strategies.

Umwelt, Acceleration, and Duration

An analytic for thinking through the pitfalls of nuclear sensing and remediation strategies can be drawn from the work of Jakob von Uexkull[146] on the Umwelt, which is made up of the Merkwelt and the Wirkwelt. von Uexkull conceived of the environment as being conceived from the "contextual capacity of a being's consciousness and senses."[147] This effectively means that a

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[144] Daniel Hirsch et al., "From Cleanup to Coverup," Committee To Bridge The Gap, August 2019, https://www.committeetobridgethegap.org/hunters-point-reports/FromCleanupToCoverup.pdf, 30.
[145] "What Are the Health Effects of Exposure to Ionizing Radiation?," SCENIHR, 2012, https://ec.europa.eu/health/scientific_committees/opinions_layman/security-scanners/en/l-3/5-health-effect-radiation.htm#:~:text=Deterministic%20effects%20.
[146] Jakob von Uexkull "A Stroll through the Worlds of Animals and Men: A Picture Book of Invisible Worlds," 1934.
[147] Barbara Adam, *Timescapes of Modernity* (Routledge, 2005), 33.

set geographical space will be conceived of as radically different environments by different beings based on their existing relationships with that environment. Von Uexküll describes the concept of the Umwelt as "All that a subject perceives becomes his perceptual world [Merkwelt] and all that he does, his effector world [Wirkwelt]. Perceptual and effector worlds together form a closed unit, the Umwelt."[148] The Merkwelt, or the perceptual world, is thus composed of an organism's various methods and capacity of perceiving the world, manipulating that information, and synthesizing it to make some sense of the world. For example, since jellyfish do not have brains, their Merkwelt is confined to electricity, or the automatic reflexive stimula which forms the basis of how they interact with the world. The Wirkwelt is the reality-generating activity of an organism. Continuing the jellyfish example, their Wirkwelt would compose of the way they interact with their environment, like the food they eat, whey they drop their excretion, and the waves they generate as they move through the ocean. These interactions are informed, whether the jellyfish is tuned to this or not, by the reality-generating activity, or Wirkwelt, of virtually every environmental factor.[149] Tim Elmo Feiten writes that "in its full sense, the *Umwelt*" – the combination of the Merkwelt and Wirkfelt – "refers to the phenomenal world which an individual organism constructs for itself by turning physical stimuli into patterns of neuronal excitation which constitute signs."[150] The sum total of an individual's experience is therefore presented to the subject as its objective reality. In regards to the Hunters Point Naval Shipyard, the environment is shaped and houses the perceptual and effector worlds, or Umwelt, of various actors, including the Hunters Point resident, gopher, former NRDL worker, city councilmember, ant, oak tree, and so on. The Merkwelt of any individual actor, which informs their actions,

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[148] Jakob von Uexküll, "A Stroll through the Worlds of Animals and Men," 6.
[149] Note on how big these theories are getting in certain fields- animal cognitive
[150] Tim Elmo Feiten, "Mind after Uexküll: A Foray into the Worlds of Ecological Psychologists and Enactivists," *Frontiers in Psychology* 11 (March 24, 2020), https://doi.org/10.3389/fpsyg.2020.00480.

cannot possibly take into account the Merkwelt and thus Wirkwelt of every other actor that shapes the environment, meaning that it is virtually impossible to make objective claims about the effect of remediation strategies.

Barbara Adam describes these two concepts as having an enormous spatial and epistemological disjuncture. The Merkwelt, or perception, is tied to an actor and is "always and necessarily contextual and locally constituted."[151] The Merkwelt effectively constitutes embodied knowledge, as it is shaped by an actor's perceptual capacities and constitutes their knowledge of an environment that they interact with. In contrast, the Wirkwelt is "spatially and temporally open and tends to extend across the globe on the one hand and to the stratosphere and the universe on the other."[152] This describes the objective reality of the world, which is comprised of the actions of the innumerable actors that shape their environment. The Wirkwelt becomes perceivable as Merkwelt "only after it materializes into a visible phenomenon at some time and some place,"[153] with "visible" referring to the perceptual capacity of an organism to understand an action.

In contrast to the *scala naturae*, which represents humans having the most advanced cognitive capacities of any living being, the knowledge of actors is confined to their fundamental perspectivity, making it virtually impossible to know every node and relation within an environmental assemblage. The human's interaction with the world includes many temporal and spatial indeterminacies in relation to the Merkwelt and Wirkwelt of various species, whose actions and causes of those actions are fundamentally unknown. This can be seen with humans' poor management of environmental hazards. For example, in the case of contamination with certain industrial chemicals, there is an unknowable gap between the penetration of these

[151] Barbara Adams, "Timescapes," 32.
[152] Barbara Adams, "Timescapes," 33.
[153] Barbara Adams, "Timescapes," 33.

chemicals into the body and the expression of symptoms, which may not even be externalized until generations after penetration. In other situations, it takes a critical mass of invisible processes to externalize as a symptom, as can be seen in the example of climate change. While technology can help broaden the human Merkwelt to different modes of perception, the complexity of the total constitution of the Wirkwelt, or the material reality of an environment, renders an objective understanding of the world impossible. We must therefore approach a study of the environment with a perspective that acknowledges its fundamental indeterminability.

The gap between the two dimensions of Merkwelt and Wirkwelt shows the fallibility of scientific knowledge of the environment. This lets us analyze the inaccurate sensing technologies used on the site as both a product of cost-cutting and deliberate negligence and the fundamental failure of devices, constructed by humans, to capture the fullness of our chemical relations, whose processes cannot be fully accounted for due to the limits of our environmental knowledge. This provides an explanation for why the Navy bypassed testing areas that had no historic radiation activities, marking them instead as having no contamination; this assumption can only be made from a standpoint that can't understand the chemical networks that are permanently a feature of our ecological relations, or through deliberate negligence. Alternatively, as I cover in Chapters 1 and 3, we can approach the study of toxic chemicals by broadening our scope of the constitutive elements of chemical infrastructures to include racial formations and the siting of toxic industries and how they interact with capitalist relations. This more directly gets to the root causes of toxic harm, and can give the power to fight conditions of contamination to affected communities instead of massive corporations.

The gap between the Merkwelt and Wirkwelt call for an understanding of the landscape that foregrounds process. A landscape is typically understood as "all the visible features of an

area of countryside or land, often considered in terms of their aesthetic appeal."[154] This understanding privileges the visual consumption of a body of land, and even attaches a moral value to its "aesthetic" qualities. This reinforces the employment of Newtonian time towards the land, or the lack of understanding of flux and process in the landscape, which renders the landscape as an atemporal entity. Barbara Adam, in contrast, understands the landscape as a "record of reality-generating activity… it is a chronicle of life and dwelling. That is to say, the visible phenomena making up the landscapes have the invisible constitutive activities inescapably embedded within them."[155] The understanding of a landscape as a record of activity opens us to the multiple temporalities of the site, defined as the "physical, embodied experiences of duration, as expressed in rhythms and cadences and actualized through specific, place-based actions."[156] This forces our analysis to stretch to encompass the rhythmicities of the site, extending deep into historical record, through the present, and into the future. This definition also includes the plurality of actors and actions that are not necessarily immediately visible in a landscape's composition, including the "invisible" activities that might otherwise escape the human Merkwelt, in addition to story-based knowledge of the site. It marks the landscape as a space of complexity and indeterminability. It also does not take the landscape itself as a point of departure, where analysis begins by studying events that occur within a given spatial area. Instead, it reframes the interactions between the environment and other actors as themselves creating the landscape. This can include meta forces, such as climate change, whose atmospheric conditions can shape the "reality" of the site despite being seemingly spatially divorced from the material reality of the site.

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[154] Oxford English Dictionary, "Landscape," Oxford University Press, 2020.
[155] Brett Milligan, "Accelerated and Decelerated Landscapes," Places Journal, February 2022, https://placesjournal.org/article/accelerated-and-decelerated-landscapes/?cn-reloaded=1.
[156] Brett Milligan, "Accelerated and Decelerated Landscapes," Places Journal, February 2022, https://placesjournal.org/article/accelerated-and-decelerated-landscapes/?cn-reloaded=1.

When humans have attempted to design the site in some way, and assert their principles of Newtonian time, they accelerate and decelerate fundamental aspects of the landscape's temporalities. We have seen how the historical and present actions of humans on the site have fundamentally altered specific site conditions, and the way this impacts the management of racialized human bodies and social structures. This can be seen as a form of acceleration, which refers to the phenomenon when "terrains morph from one condition to another, colonizing space through a particular material and spatial scheme, influenced (but not determined) by the select actions of human designers."[157] This spatial transformation occurs through the actions of all human and more-than-human beings, with varying degrees of spatial "colonization." Beavers build dams in streams, a spatial transformation which deaccelerates processes such as the flow of water, which ultimately reduces stream erosion and can mitigate flooding from storms. However, humans eliminated nearly 40 to 60 million beavers during the 19th century fur trade,[158] accelerating the processes of flooding and erosion. Both practices resulted in significant spatial and temporal transformations. The Ramaytush Ohlone people inhabited the land for thousands of years prior to the arrival of Spanish missionaries in the 18th century. Their natural resource practices, like setting fires to old growth forests, ensured that they would get a better yield of seeds for subsistence.[159] The acceleration of the temporality of old growth forests, where fires are started periodically due to intrinsic features of the ecosystem, was done with intention to maintain and improve the land which people used for subsistence, and thus, was situated in a careful relation to the site's temporalities. In contrast, the siting of San Francisco's noxious

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[157] Brett Milligan, "Accelerated and Decelerated Landscapes," Places Journal, February 2022, https://placesjournal.org/article/accelerated-and-decelerated-landscapes/?cn-reloaded=1.
[158] Meagan Campbell, "Canada's Beaver Problem," Maclean's, July 5, 2017, https://macleans.ca/news/canada/canadas-beaver-problem/#:~:text=Two%20hundred%20plus%20years%20of,the%20continent%20(including%20Mexico)..
[159] Damian Bacich, "Native Americans of the San Francisco Bay Area: The Ohlone Tribe, Part 1," The California Frontier Project, 2018, https://www.californiafrontier.net/ohlone-tribe-language-food-clothing/.

industries in a dense concentration in Hunters Point, rapidly sped up processes of water and air quality deterioration in relation to San Francisco's other landscapes.

The Navy's remediation process can be seen as a technique of deacceleration, as it attempts to minimize the effects of the industrial and waste-transformation of the site. When the Navy began its remediation process in BHP in the 1990s, Navy officials promised that the site would be "scrubbed to the highest standards, essentially returned to its state before Cold War nuclear waste and industrial shops tainted the land."[160] The Navy effectively wants this "return" to transform the site to its state before industrial development, bringing the site out of its perceived value as a wasteland. This return to a "natural" landscape is premised on the ability of technologies to go against the site's temporalities and effectively reverse time. The fallibility of this logic can be seen through the concept of "duration," theorized by Elizabeth Grosz, a feminist philosopher. Grosz writes that,

> Duration is difference, the inevitable force of differentiation and elaboration, which is also another name for becoming. Becoming is the operation of self-differentiation, the elaboration of a difference within a thing, a quality, or a system that emerges or actualizes only in duration. Duration is the field in which difference lives and plays itself out, the domain of becoming; duration is that which undoes as well as makes. To the extent that duration entails an open future, it involves the fracturing and opening up of the past and present to what is virtual in them, to what in them differs from the actual, to what in them

[160] Jason Fagone and Cynthia Dizikes, "Navy Altered Hunters Point Cleanup to Cover, Not Remove, Toxic Soil," San Francisco Chronicle, August 14, 2019, https://www.sfchronicle.com/bayarea/article/Report-Navy-altered-Hunters-Point-cleanup-to-14302320.php#photo-18070666.

> can bring forth the new. This unbecoming is the very motor of becoming, thus making the past and present not given but fundamentally ever-altering.[161]

Conceptualizing duration, or the transformations that occur over the course of time, as an act of differentiation, allows us to understand the landscape system of HPNS as an infinitude of actors, including more-than-human beings, chemical bodies, and the landscape's physical properties, undergoing a process of becoming. This process involves "fracturing and opening up the past," investigating the material histories of the actors present on the site and their historical transformations, both cumulative and atemporal, to elucidate the self-differentiated subjects that compose the site as we know it today. With regards to contamination, through time, chemicals have become a permanent feature of life in the site of HPNS. Thus, their impact, or fact as a feature of life, is irreversible to a degree. While we can attempt to mitigate their impacts on the health of bodies and environments, duration has caused bodies to evolve, or self-differentiate, in conjunction with this fact about chemicals, whether humans were aware of it or not. This temporal dimension points to yet another reason we need a new way of thinking about ecological and chemical relations. Just as the so-called spatial boundaries covered in this chapter are shown to be porous, time is not partitioned, but has duration. This calls for new forms of relations to chemicals, both political and quotidian, which will be the topic of Chapter 3.

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[161] Elizabeth Grosz, "Bergson, Deleuze and the Becoming of Unbecoming," *Parallax* 11, no. 2 (April 2005): 4–13, https://doi.org/10.1080/13534640500058434, 4.

Chapter 3: Toxic Politics and Chemical Relations in Bayview-Hunters Point

Introduction

In this chapter, I explore the novel forms of toxic politics and chemical relations that emerge in and through grassroots actions. I rely on theories of toxicity and its oppositional political formations offered by Max Liborion, Noémi Tousignant, Manual Tironi, Nerea Calvillo, and Michelle Murphy. To arrive at my analysis, I studied the Bayview Hunters Point Mothers Environmental Health & Justice Committee's "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco"[162] report, over 300 reports from a community-led toxic mapping and environmental violation reporting project, and an community-led air quality monitoring project, with an analytic eye towards how these actions conceptualize and respond to conditions of toxicity.

Theoretical Foundations of Toxic Politics

The Oxford Advanced Learner's Dictionary defines the term toxicity as "the fact of being poisonous," or the "effect that a poisonous substance has." This definition relies on a fetishization of individual harm-causing molecules,[163] which creates an ontological disjuncture between molecules and the socio-historical contexts of their origins. The following contemporary

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[162] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf.

[163] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087,

articles on chemical infrastructures and their alterlives depart from this dominant view, and instead understand toxicity as a "disruption of particular existing orders, collectives, materials and relations."[164] Toxicity simultaneously perpetuates the existence of specific extractive relations, or at least allows for them, through the expropriation (Fraser 2016) of racialized and classed subjects.

The common relation upheld between the three articles discussed in this chapter, as well as the history of Bayview-Hunters Point and The Fillmore District, is that of capital accumulation. Whether that be the financial extraction and racial dispossession resulting from land speculation in Hunters Point, or the environmental degradation occurring from Puchuncaví's state-run petrochemical and copper smelting industries.[165] It doesn't matter how much harm is done to bodies or ecologies, capitalist production relies on these landscapes designated as value-less or wasted to continue through these slow disasters. Toxicity thus can be classified as a "specific genre of harm that is about ordering living systems, broadly defined to include scales from cells to ways of life,"[166] allowing some systems to die in order to reproduce others. This logic is in part enabled by the capitalist logics to broadly label environmental systems and expropriated bodies as externalities.

Within the context of Bayview-Hunters Point, the various actors and ecologies accountable for this harm can be charted through the neighborhood's chemical built ecologies, or chemical infrastructures. Murphy defines chemical infrastructures as the "spatial and temporal

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[164] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.
[165] Manuel Tironi, "Hypo-Interventions: Intimate Activism in Toxic Environments," *Social Studies of Science* 48, no. 3 (July 2, 2018): 438–55, https://doi.org/10.1177/0306312718784779.
[166] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.

distributions of industrially produced chemicals as they are produced, consumed, become mobile in the atmosphere, settle into landscapes, travel in waterways, leach from commodities, are regulated (or not) by states, monitored by experts, engineered by industries, absorbed by bodies, metabolized physiologically, bio-accumulate in food changes, break down over time or persist" (Toxicants, health and regulation, 2013). Chemical infrastructures are often obscured from communities impacted by toxic violence, hidden by the folds of bureaucracy and bylaws. Their apolitical construction allows them to stay hidden, often diverting environmental political action to the harm caused by particular molecules instead of the systems that produce them.

As Tironi writes, "toxicity is lived in the rhythm of ordinary corrosion and decay, in the nondescript temporality of chronicity and continuity,"[167] which means that political conflict and events are substituted for violence that is more latent. As seen from the discussion of von Uexhall's *Umwelt* in Chapter 2, the violence arising from chemical infrastructures is temporally indeterminate, arising from the indeterminate character of our human and more-than-human ecological systems. Its effects too are felt on temporally and spatially indeterminate scales, and by bodies, communities, and ecosystems marked as national sacrifice zones, or areas of "waste," referring to its definition as the "political other of 'value'" (Gidwani and Reddy, 2011). These areas are reproduced by systems of power such as colonialism, racial capitalism, and patriarchy.

The unevenly distributed "slow violence"[168] of nuclear and industrial toxicants in Bayview-Hunters Point requires a reconceptualization of the forms of action, or politics, in opposition to toxicity's disruption of social reproduction. As I will discuss in the next section, this politics often takes the form of exposing contamination's chemical infrastructures. This

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[167] Manuel Tironi, "Hypo-Interventions: Intimate Activism in Toxic Environments," *Social Studies of Science* 48, no. 3 (July 2, 2018): 438–55, https://doi.org/10.1177/0306312718784779.
[168] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Massachusetts: Harvard University Press, 2011).

provides the conditions of possibility for the alterlife, which Michelle Murphy defines as a "figuration of chemical exposures that attempts to be as much about figuring life and responsibilities beyond the individualized body as it is about acknowledging extensive chemical relations."[169] Reorienting oneself to one's chemical relations, which are rendered visible through a study and exposition of chemical infrastructures, allows for community members to act on the multitude of ways in which toxicity is produced and enacted.

Toxicity then moves from the legal and scientific realms of knowledge production to something that can be engaged with more comprehensively by residents, and also allows residents to strategize novel ways of surviving toxic life. This often requires a move away from demands to the state, which continue to be systematically denied. A toxic politics then "rehearses an analytic for understanding and intervening into toxicity both as an affection/affliction and as an infrastructure and infrastructuring process with power relations and what counts as good and proper relations at its core."[170]

Conceptualizing Toxic Politics and Relations through BHP's Grassroots Programs

In Bayview-Hunters Point, community movements are building on a long lineage of political action to expose and figure new ways to live with the chemical infrastructures governing life in their neighborhoods. In 2004, the Bayview Hunters Point Mothers Environmental Health & Justice Committee, Huntersview Tenant Association, and Greenaction for Health & Environmental Justice, published the report, "Pollution, Health, Environmental

[169] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02.
[170] Noémi Tousignant, *Edges of Exposure Toxicology and the Problem of Capacity in Postcolonial Senegal* (Durham London Duke University Press, 2018).

Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco."[171] The report inventories Bayview-Hunters Point's numerous toxicant-producing industries, as well as the web of chemical infractures that the toxicants travel through. Before undertaking the project, the grassroots organizations led multiple skill trainings in computer skills, computer research, community organizing, environmental health, public speaking, and social media, in order to train the community's mothers to be effective activists.[172] The Mothers Group subversively used data and research from the various governmental agencies that were complacent and enabled BVHP's continued contamination.[173]

The toxic inventory consists of profiles of various toxicant-producing industries. It lists every building or company, and talks about its contemporary use, its historical development, the politics surrounding its creation if there are any, and the harmful chemicals that it "mismanages." I write "mismanages" because the ways these companies dealt with contamination frequently passed regulatory standards. In the report's section on toxic discharge to water systems, the group states the specific governmental agencies that gave permits for these companies to discharge water into a water body whose health is directly tied to the health of human and more-than-human natures.[174] This is able to extend the map of chemical infrastructures that started in the toxic inventory in multiple ways. It maps out toxicant's physical representations by

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[171] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf.
[172] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf, 2.
[173] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf, 2.
[174]"Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf, 13.

showing the ways in which toxicants disperse from toxicant-producing plants to the environment, and the political structures that enable BVHP's contamination.

The toxic inventory report has multiple uses for the grassroots organizations involved in its creation. The report lists that its primary goals were to "examine the environment in their own neighborhood and prioritize the issues they felt most urgently needed to be addressed," and to "present the results of their research to the community in order to generate additional involvement from the community in environmental health and justice issues" (Mothers Group 2). This shows how its primary goal was to build political and ecological consciousness around contamination in the neighborhood. The report also compiles environmental violence in a way that might make it clearer to regulatory agencies the extent of damage they are doing through the chemical infrastructures that it illustrates. However, this does not seem to be the group's primary goal, as the report includes a lengthy list of the ways USEPA, Department of Toxic Substances Control, San Francisco Regional Water Board, Bay Area Air Quality Management District (BAAQMD), and the City has repeatedly failed to properly survey and remediate BVHP, and has ignored resident's demands and appeals.[175] This shows how expropriated populations facing slow violence sometimes "do not attempt to further penetrate the recesses of state bureaucracies to dispute their social exclusion, but rather have begun to enact justice in their everyday material and affective relations on and beyond" their community.[176] Rather than make appeals to organizations external to the community, who have systematically enabled damage to be located in the community and have not developed the same sort of subjectivity to toxicity that many

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[175] "Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco," Bayview Hunters Point Mothers Environmental Health & Justice Committee, July 2004, https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf, 28.
[176] Kristina Lyons, "Chemical Warfare in Colombia, Evidentiary Ecologies and Senti-Actuando Practices of Justice," *Social Studies of Science* 48, no. 3 (March 23, 2018): 414–37, https://doi.org/10.1177/0306312718765375, 18.

residents have, the report's largest impact seems to have been aiding in the monumental shutdown of the PG&E plant, discussed in Chapter 1.

We can more broadly conceptualize this practice of toxic inventorying as a practice of "attuned sensing," following Nerea Calvillo's work in "Political airs: From monitoring to attuned sensing air pollution." Attuned sensing refers to resident practices of engaging with sensing that did "not focus on quantities of pollutants, but specified, spatialized and differentiated what the toxic air was and to which other materials, infrastructures and institutions it was connected" to, making toxicity a "qualitative condition distributed in space and time" (Calvillo 2018). Like in Calvillo's case study of a air pollution scandal in Madrid, the work of the Mothers Group made toxicity itself accountable, not as evidence of pollution levels but by making visible the political, social, and environmental entanglements involving air pollution, or its chemical infrastructure, and exposed them as potential sites of action and intervention. In this way, inventorying BHP's toxic histories is a form of knowledge production. While the inventory, as a form of an alternative regime of perceptibility, did not change the toxicant levels in the environment, it made BHP's chemical infrastructure more visible. Exposing the chemical infrastructures that one is intermeshed in expands the realm of one's chemical relations, and produces new conditions of possibility for political engagement with and against contamination.

The demographic of the organizers leading this project, who were predominantly Black mothers-turned-activists, points to how the conditions of racialized and gendered toxic life transform people's subjectivity into one oriented around environmental justice. Black women have consistently been at the forefront of environmental justice collectives and organizations in BHP, the first of which was the "Big Five" mentioned in Chapter 1, indicating the role that Black mothers have played in "sustaining"[177] life in BHP. Attuning their children and the state towards

[177] Joshua Chambers-Letson, *After the Party* (NYU Press, 2018), 81.

the death-dealing chemical infrastructures of BHP is an action that emerges out of the mothers'[178] orientation to sustain social reproduction in their community. This subjectivity and political positionality has been integrated into more contemporary iterations of environmental justice actions, including those of Greenaction.

Greenaction for Health and Environmental Justice organization is building off of the work of historical and adjacent community organizations to fight for environmental justice. The grassroots environmental justice organization is composed of urban, rural, and indigenous communities from California and Arizona; however, its staff and key programs are primarily based in Bayview-Hunters Point.[179] Many community organizers from Bayview-Hunters Point, including those affiliated with the former Mother's Group, work in coalition and within Greenaction to organize actions around the contamination and redevelopment happening in the neighborhood.

Greenaction and the coalitions it works are grassroots groups, meaning they are led by community members and foreground the community's issues in their work. In order to bridge the gap between community activists and community members, their group, the Bayview Hunters Point Environmental Justice Task Force, is composed predominantly of residents. In order to make their meetings more accessible, they alternate from afternoon and evening meetings so that people can attend around their work schedules, and have virtual calls so that they have better accessibility for people who are at higher risk for Covid or who may have transportation difficulties. A separate program, called the Youth Environmental and Climate Justice Leadership Academy, focuses on training youth how to become environmental advocates. In toxic landscapes, Greenaction shows how it is crucial that all community members, who may have

[178] Joshua Chambers-Letson, *After the Party* (NYU Press, 2018), 83.
[179] "Our Story," Greenaction for Health & Environmental Justice, n.d., http://greenaction.org/our-story/.

different capacities for political action, are equipped with the skills needed to translate their experiences with toxicity to environmental justice actions, strengthening community responses to slow violence. The result of training community members to become advocates and to integrate non-organizers into organizing spaces can be seen in the sharp analysis and campaigns carried out by the group. For example, Greenaction has been conducting educational campaigns around the way rising sea levels would displace the contamination put under earth "caps" and flood homes with radioactive and industrial waste, combining place-based knowledge with political action. In addition to educating residents, they are making appeals to the city in order to get them to reevaluate remediation strategies.[180]

The Greenaction organization leads a series of campaigns and programs against toxic contamination in Bayview-Hunters Point. The group has filed administrative petitions with the US Nuclear Regulatory Commission and California Department of Public Health against Tetra Tech's malpractices discussed in Chapter 2, collecting testimonies and whistleblowers. They have also appealed to stop the development of the India Basin Mixed-Use Development, on grounds that the site is still polluted at unhealthy levels, and are working with truckers and businesses in the neighborhood to stop the idling of commercial vehicles.[181]

Greenaction is also taking actions that extend the subject of toxic politics beyond the effects of specific chemicals, companies, or toxic hot spots, to chemical infrastructures and orders. One campaign focuses explicitly on organizing against the displacement and gentrification resulting from redevelopment in the neighborhood. This expands understandings of where environmental justice's commitments lie by defending racialized and classed

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[180] "Bayview-Hunters Point," Greenaction for Health & Environmental Justice, n.d., http://greenaction.org/our-story/.
[181] "Bayview-Hunters Point," Greenaction for Health & Environmental Justice, n.d., http://greenaction.org/our-story/.

individuals alongside environmental actions, broadening the sphere of what is considered the environment to include people and systems of power. Under our new conception of toxicity as disrupting particular existing orders and relations[182] and the expropriation that occurs in these fissures, we can too classify anti-displacement actions as a form of toxic politics.

Greenaction's understanding of chemical relations, and thus the subject of their toxic politics, extend to more-than-human natures. As an example, one campaign focuses on the contamination of waterways, and the way these contaminants make their way into the fish people eat. This involves educational campaigns with both fishers and communities that source their fish directly from the bay. This work builds on transcorporeal environmental politics, which refers to the "fluidity between material and theoretical bodies, challenging dualities and dichotomies."[183] This can refer to the material exchanges between human and more-than-human natures, an exchange which is reliant on re-formulating the human as an ecological subject. This inspires a politics that is attentive to the way chemical infrastructures unevenly affect humans, animals, and environments.

The Social Infrastructures of IVAN

In 2015, the Bayview Hunters Point Environmental Justice Response Task Force joined the Identifying Violations Affecting Neighborhoods (IVAN) network. IVAN was started after a series of toxic bus tours that visited sites within the Imperial Valley, a predominantly low-income Hispanic neighborhood, identified by community organizers as environmental toxicity hotspots.

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[182] Max Liboiron, Manuel Tironi, and Nerea Calvillo, "Toxic Politics: Acting in a Permanently Polluted World," *Social Studies of Science* 48, no. 3 (June 2018): 331–49, https://doi.org/10.1177/0306312718783087.

[183] Sanita Fejzic, "What Is Transcorporealtiy ," InfScipedia, 2020, https://www.igi-global.com/dictionary/transcorporeality/87370#:~:text=Transcorporeality%20pertains%20to%20fluidity%20between,other%2Dthan%2Dhuman%20bodies..

Workshops following these tours, co-organized by community members and Department of Toxic Substances Control employees, led to the creation of IVAN.[184]

IVAN runs two environmental mapping projects, toxic mapping and air quality monitoring, both of which are controlled by community members. It takes its launching point to be that "this community-based environmental monitoring system is built on the idea that residents are the most knowledgeable about their environment and therefore should have a place at the table with regulation agencies."[185] This philosophy shows how Greenaction is subverting toxic regimes of perceptibility, discussed in Chapter 2, by advocating for place-based knowledge production that is community-led, which builds on Calvillo's work on "attuned sensing."[186] While their toxic mapping and air monitoring data can be used to make appeals and lawsuits against remediating agencies and the state, the group is primarily focused on strengthening community resilience, with their mission page explicitly stating their goal of "improving communication and collaboration between stakeholders in order to overcome decades of lack of trust" between political groups in the BHP.[187] It also continues Greenaction's goal of building a broad organizer base, educating community members on ways to reorient themselves to chemical infrastructures.

Rather than make its primary goal to capture social power from the state (i.e. help provide evidence for certain appeals to the state or the courts), the IVAN model instead prioritizes "reshap[ing] how vulnerable communities protect, and in the process, reclaim their

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[184] "About IVAN," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.
[185] "About IVAN," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.
[186] Nerea Calvillo, "Political Airs: From Monitoring to Attuned Sensing Air Pollution," *Social Studies of Science* 48, no. 3 (June 2018): 372–88, https://doi.org/10.1177/0306312718784656.
[187] "About IVAN," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.

environment that has been systemically disregarded as a sacrifice zone."[188] As seen from Lyons' case study of fumigated farms in Putumayo, the timelines associated with pushing back against one's social exclusion from the state, and its resulting toxic effects, are timescales that simply cannot be taken for granted by bodies highly exposed to toxicants.[189]

IVAN's primary function is to compile residents' environmental complaints and violations. People can submit reports through the online website,[190] and are asked to include a title, address, date, category (air, diesel idling, other, pesticides, solid waste, toxic substances, and water), and description. There is also a confidential section where one can fill in their contact details so that they can follow up about the report, and places to add supplementary information, such as an image, video, or document, to the report. Once a report has been submitted, it is compiled in both a list form and a spatial form. The spatial layout uses an add-on to Google Maps, with violations indicated by markers, which change in color based on the density of violations in an area. There is also an option to filter violations by category. Another feature of the reporting system is that you can sign up for local alerts of violations, and can filter for one or more categories of violations.[191]

I analyzed 300 reports from 2019 to 2023 in order to better understand how people are using the tool in recent years. The vast majority of violation reports are about illegal solid waste dumping, primarily coming from outside the community.[192] To this day, the city's public services

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[188] "About IVAN," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.
[189] Kristina Lyons, "Chemical Warfare in Colombia, Evidentiary Ecologies and Senti-Actuando Practices of Justice," *Social Studies of Science* 48, no. 3 (March 23, 2018): 414–37, https://doi.org/10.1177/0306312718765375.
[190] "Reports," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.
[191] "Reports," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/about#menu.
[192] "Report 630," Bayview Hunters Point Environmental Justice Response Task Force, March 2, 2023, https://bvhp-ivan.org/reports/630.

are systematically letting people dump waste and not clean waste up off of public property. Following my analysis in Race, Space, and Waste, in Chapter 1, we can see how spatial and cultural associations of BVHP as a wasteland and dumping ground continue today. IVAN's mapping project, however, gives residents a way to respond to illegal dumping through mapping and reporting it on a platform that is highly visible to both the state and the media. In response to solid waste dumping, one resident said "this trash is nearby a water drain, which could present issues of contamination should it rain,"[193] connecting dumping practices with damage done to BVHP's ecosystems and water supply. Another resident took detailed pictures of a "discontinuous fence line exposing the community to the shipyards toxic Parcel F sediment,"[194] showing how residents use this mapping tool to demarcate areas which are unsafe for community members. Another community member uses the fact that their residence is on top of a hill in Hunters Point to locate the source of an industrial smell coming from nightly construction activity in a HPNS parcel being remediated,[195] so that the community Task Force could investigate the issue. This cartographic tool thus provides a way for the community to map their chemical relations and act on their chemical infrastructures

The mapping tool has also shown to be helpful in getting the BAAQMD to respond to particular environmental violations, like dust coming from a construction site. One report says "INNES Ave of Middlepoint Street - Bay VIEW San Francisco - the serpentine rock is being excavated for a past few days. What is happening there? The poisoning rock and gases are

[193] "Report 569," Bayview Hunters Point Environmental Justice Response Task Force, August 3, 2022, https://bvhp-ivan.org/reports/569.
[194] "Report 449," Bayview Hunters Point Environmental Justice Response Task Force, August 3, 2022, https://bvhp-ivan.org/reports/449.
[195] "Report 520," Bayview Hunters Point Environmental Justice Response Task Force, March 26, 2022, https://bvhp-ivan.org/reports/520.

relieved to the neighborhood,"[196] referencing excavation that was happening, without water to fix dust to the ground, in the neighboring India Basin community. The BAAQMD responded to the report immediately and sent out an Air Quality Inspector, presumably because the report entered a highly visible platform and because the source of pollution was so clear. In other cases, like a picture of an IVAN air quality monitor that had a CAL reading of 189 (indicating unhealthy air quality for all populations) next to a remediation site, the report said that "I contacted BAAQMD to notify them of the high levels, and they said that they could not do anything because I do not know what is causing this high level."[197] The response shows the limited scope of the BAAQMD: despite being an environmental regulatory agency, they refuse to follow up on environmental issues related to remediation activities. They also systemically neglect embodied contamination experiences, for example, by relying on air quality monitors or other data in cases where a large number of reports claim that they have been having respiratory issues due to a nearby work site.[198] This reinforces the need for community members to find alternative ways to safely navigate these toxic landscapes, where both toxicant molecules and developer interests have so deeply contaminated the community that it is impossible to rely on the state to regulate them.

The mapping of environmental hazards in BVHP is a way to further make visible the contours of BVHP's chemical infrastructure–specifically, the point at which residents are most directly interacting with chemical violence. This moves conditions of toxicity, whose chemical constituents are often not visible and knowable with the human eye, from being amorphous to

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[196] "Report 347," Bayview Hunters Point Environmental Justice Response Task Force, May 14, 2019, https://bvhp-ivan.org/reports/347.
[197] "Report 576," Bayview Hunters Point Environmental Justice Response Task Force, September 9, 2022, https://bvhp-ivan.org/reports/576.
[198] "Report 347," Bayview Hunters Point Environmental Justice Response Task Force, May 14, 2019, https://bvhp-ivan.org/reports/347.

something more tangible. Mapping thus allows residents to have a relation to chemical infrastructures in a way that allows them to traverse toxic landscapes in comparative safety. We can also apply Lyons' evidentiary ecologies concept to understand this practice as a way to memorialize waste. Evidentiary ecologies are ecologies that "retain the traces of violence enacted against them, and hence signal specific accountabilities in the face of ongoing impunity, even as contaminated life is re-composed."[199] Lyons profiles a farmer who leaves the "skeletons" of fumigated, leafless, trees on his farm, as both a memorial to toxic fumigation and as evidence of the damage of aerial aspersion on his farm,[200] which makes visible the plurality of violences occurring on the land, from chemical manufacturers, right-wing militias, state agencies, and neoliberal anti-drug policies. Memorialization in the form of IVAN's mapping project can thus be read as a political act against the Navy's technoscientific solutions to bury waste under earth material, giving the illusion that because there are no visible markers of waste on the land, that it is gone.

IVAN's second project is an air monitoring network called the Marie Harrison Bayview Air Monitoring Network, named after the late Marie Harrison who was a Bayview Mothers Group and Greenaction organizer. The network is co-run by Greenaction, the Bayview Hill Neighborhood Association, Bayview Hunters Point Mothers and Fathers, and Literacy for Environmental Justice, in addition to a four-person Community Steering Committee, formed entirely by residents, who do the physical work of canvassing sites and setting up air monitors in the community. There are currently eight particulate matter air quality monitors, with plans for

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[199] Kristina Lyons, "Chemical Warfare in Colombia, Evidentiary Ecologies and Senti-Actuando Practices of Justice," *Social Studies of Science* 48, no. 3 (March 23, 2018): 414–37, https://doi.org/10.1177/0306312718765375, 8.

[200] Kristina Lyons, "Chemical Warfare in Colombia, Evidentiary Ecologies and Senti-Actuando Practices of Justice," *Social Studies of Science* 48, no. 3 (March 23, 2018): 414–37, https://doi.org/10.1177/0306312718765375, 8.

two more, that are set up with community hosts. Real-time data can be found on the website, along with a map of the monitor network. There is also an option to get real time email alerts when the air quality of specific monitors that you select goes above a certain level.[201]

The air quality monitoring project shifts both how and why air monitors are used in relation to government regulatory air monitors. Its data cannot be used to infer violations to the law, as the monitors are not regulatory,[202] meaning that the network is set up solely for the community's use. IVAN applies attuned sensing by shifting the regime of perceptibility around the locations of the air quality monitors in addition to for whom the air quality is being monitored for. The monitors are located in areas that are densely populated and trafficked, while government regulatory monitors are not necessarily placed with attention to air quality's effects on certain communities. The philosophy governing IVAN's placements is to provide real-time data to allow residents to navigate their toxic landscapes with comparative safety.[203] Alerts tell you what populations with what conditions are able to safely leave their ventilated homes at what times, a necessary practice when calls for environmental cleanup and accountability have been ignored for decades. These stations thus represent a mode of survival that shows how residents are adapting their ways of life to and around loci of contamination.

Conclusion

In this chapter, I have reviewed forms of toxic politics that engage with multivalent forms of toxic contamination. The way I have framed toxicity itself is as harm that orders living

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[201] "IVAN Air Monitoring," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/air.
[202] "List of Air Monitors," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/air/list?sorts[communityAirQualityLevel-(Cal)]=1.
[203] "List of Air Monitors," Bayview Hunters Point Environmental Justice Response Task Force, n.d., https://bvhp-ivan.org/air/list?sorts[communityAirQualityLevel-(Cal)]=1.

systems at various scales, disrupting some to allow others to reproduce. Oppositional actions have historically been led by generations of Black women to restore social reproduction in BHP in piecemeal ways. These actions repair social life in the here and now, alongside broader advocacy of a more comprehensive and equitable removal of contaminants from the site. This contradicts the orientation of the Navy, City, and developers towards remediation, who fetishize a purity of the land and of a past which is now out of reach, as discussed in Chapter 2. This orientation also views remediation as a way to make the land more productive, rather than protect BHP's existing communities. Instead, the grassroots actions profiled create a multitude of ways of engaging with chemical relations, whether that be developing social, community-based infrastructures to help residents safely (as safe as is possible) traverse contaminated landscapes, or empowering residents to fight the ongoing displacement from their homes. The strategies used on the site disrupt the double death, or "the extension of death accompanied by the impossibility of life,"[204][205] through an orientation towards chemicals that resists the imposition of toxicity while still recognizing the realities of the alterlife, or "the persistent and integral chemical alteration of existence by contemporary industrial development.[206][207]

[204] Manuel Tironi, "Hypo-Interventions: Intimate Activism in Toxic Environments," *Social Studies of Science* 48, no. 3 (July 2, 2018): 438–55, https://doi.org/10.1177/0306312718784779.
[205] Deborah Bird Rose, "Multispecies Knots of Ethical Time," *Environmental Philosophy* 9, no. 1 (2012): 127-40, http://www.jstor.org/stable/26169399.
[206] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02.
[207] Manuel Tironi, "Hypo-Interventions: Intimate Activism in Toxic Environments," *Social Studies of Science* 48, no. 3 (July 2, 2018): 438–55, https://doi.org/10.1177/0306312718784779.

Conclusion

"Living in Prognosis"

The technocratic logics of environmental remediation at Bayview-Hunters Point raise a larger set of questions about able-bodiedness with which I end this thesis. Former HPNS workers' inability to receive recompensation for their contamination-induced disabilities,[208] and the threat of displacement resulting from remediation for BHP's existing communities, suggest that contamination and remediation are often tied to notions of restoring the body's or land's productivity. Within this logic, the problem of contamination is the problem of bodies that can't labor; thus, remediation is about getting back to work.

The logic of contamination and productivity can be illuminated through frameworks of crip theory. In this section, I discuss the way crip theory can help engender new relations to and within states of contamination. The social experiences of contamination can be understood under the framework of compulsory able-bodiedness, which orients dis/ability around a set of normative relations. The system of compulsory able-bodiedness outlined in Robert McRuer's *Crip Theory* is deeply intertwined with the system of compulsory heterosexuality. The meaning of this latter system can be excavated by its definition: in the 1971 Oxford English Dictionary (OED) Supplement, heterosexual was defined as "pertaining to or characterized by the normal relations of sexes; opp. to homosexual."[209] McRuer details that in subordinating homosexuality to heterosexuality, a normal relations of sexes is produced, and in institutionalizing the normal

[208] Lindsey Dillon, "Race, Waste, and Space: Brownfield Redevelopment and Environmental Justice at the Hunters Point Shipyard," *Antipode* 46, no. 5 (October 23, 2014): 1205–21, https://doi.org/10.1111/anti.12009, 14.
[209] Oxford English Dictionary, "Heterosexual," Oxford University Press, 1971.

relations of sexes, homosexuality is subordinated. A similar rhetorical exercise can help us understand how able-bodiedness becomes compulsory; it is defined by the OED as "having an able body, i.e. one free from physical disability, and capable of the physical exertions required of it; in bodily health; robust."[210] Able-bodiedness is similarly defined by its inverse, to not be disabled, and is set up to be the normative relation of social life by being understood as "capable of the physical exertions required of it," or the exertions required to participate in a capitalist system of labor. Importantly, the normal relations that are created introduces compulsion into the system, as to be other to the normal is to be deviant.[211]

The links between a system of compulsory able-bodiedness and affective understandings of contamination can be seen in the definition of 'contaminated' by the OED: "defiled, sullied, or infected by contact, esp. with noxious substances."[212] With regards to bodies, this can be understood in a system of compulsory able-bodiedness as it refers to the damage of the purity or integrity of the body. However, only contamination that pushes the body into some state of unproductivity, in the form of cancers or genetic hereditary effects, creates a body that can be read as disabled and contaminated, as seen in the definition of able-bodiedness. Linking of productivity to able-bodied status contextualizes able-bodiedness, and thus the experiences of being contaminated/not, to a history of industrial capitalism.

McRuer's concept of ability trouble builds on Judith Butler's concept of gender trouble to uncover the incomprehensibility and impossibility of an able-bodied existence. Its incomprehensibility, like that of the heterosexual existence, lies in the fact that the "able-bodied" identity "is performatively constituted through an imitation that sets itself up as the origin and

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[210] Oxford English Dictionary, "Able-bodied," Oxford University Press, 1971.
[211] Robert McRuer, "Compulsory Able-Bodiedness and Queer/Disabled Existence," in *The Disability Studies Reader*, ed. Lennard J. Davis (Taylor and Francis, 2013), 371.
[212] Oxford English Dictionary, "Contaminated," Oxford University Press, 2020.

the ground of all imitations…always in the process of imitating and approximating its own phantasmatic idealization of itself—and failing."[213] The compulsory system claims that it is the foundation upon which all other forms of identities are constructed, as seen in the discursive analysis of the meaning of able-bodiedness and contamination. Yet it is never able to achieve its full "able-bodied" or "heterosexual" status due to these identities being ideals. An example of the endless failure to achieve its status that McRuer gives is that age will ultimately penetrate and destroy the "health" of any body, in addition to other bodily "defects" like eyesight impediments or skin blemishes that affect virtually all bodies. The "persistent failure to identify fully and without incoherence with these positions reveals [able-bodiedness] itself not only as a compulsory law, but as an inevitable comedy."[214]

The incoherence and ongoing failure to achieve an identity status can be proven in the case of contamination, where only certain populations are popularly read as being contaminated when in reality, it affects virtually all bodies. In the case of PCBs today for example, an industrial chemical that is heavily present in HPNS, analyses of urine, blood, and breastmilk have shown that all people alive today are living with PCBs.[215] The selective application of the status of 'contaminated' and the contaminated's racialized and gendered biopolitical management signals its not-normative, queer[216] position.

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[213] Judith Butler, "Imitation and Gender Insubordination," in *Lesbian and Gay Studies Reader*, ed. Henry Abelove, Michele A. Barale, and David M. Halperin, 1993, 307–20.

[214] Robert McRuer, "Compulsory Able-Bodiedness and Queer/Disabled Existence," in *The Disability Studies Reader*, ed. Lennard J. Davis (Taylor and Francis, 2013), 373.

[215] Guomao Zheng et al., "Per- and Polyfluoroalkyl Substances (PFAS) in Breast Milk: Concerning Trends for Current-Use Pfas," *Environmental Science &Amp; Technology* 55, no. 11 (May 13, 2021): pp. 7510, https://doi.org/10.1021/acs.est.0c06978.

[216] Cathy J. Cohen, "Punks, Bulldaggers, and Welfare Queens: The Radical Potential of Queer Politics?," *GLQ: A Journal of Lesbian and Gay Studies* 3, no. 4 (January 1, 1997): 437–65, https://doi.org/10.1215/10642684-3-4-437.

The compulsory, normative nature of the system forces questions from the able-bodied perspective that in some form communicate the message: wouldn't you rather be like me (un-contaminated, un-disabled, un-queer)? This question has analogs to the technocratic logics behind environmental remediation seen in Hunter's Point, and Navy worker's recompensation constraints around specific medical parameters. The question comes from a place of insecurity, where the answer, "no," would deeply penetrate the compulsory endlessly-repeating and never-achieving system of compulsory able-bodiedness through exposing alternative ways of living that are not oriented around systems of racial capitalism. Exposing the self-parody of the compulsory system helps us reorient the study of contamination, from solving the problem of contamination itself, to exposing the impossibility of an able-bodied or uncontaminated existence, and its intrinsic comedy. Viewing this comedy as just a single, narrow, perspective on contamination opens us up to the plurality of forms of embodiment and desire in the midst of contamination. The perspective of these non-normative positions are key for imagining new, just ways of being and relationships to the environment.

As I have demonstrated in the previous chapter, BHP activists have a much more expansive vision of contamination and remediation. They broadly take the starting point of their political and subjective formations to be in and of contamination, rather than strictly against, which does not foreclose the possibility of still advocating for remediation and against conditions of toxicity. Such a position can be seen in community-run tools such as IVAN's toxic mapping and air quality project, which help residents navigate already-contaminated landscapes, as they show how community members are navigating life in the here and now of contamination.

We can connect crip theories' contributions to the study of the formations of subjectivity and politics in a toxic life through Murphy's conception of the alterlife, discussed in Chapter 3.[217] The condition of the alterlife exposes the seams of chemical infrastructures and the socio-historical injustices that form them, in order to open up spaces of possibility and action that are not premised on the fetishization of the molecule.

Building on the intersection of alterlife and crip theory, I introduce the term *toxic subjectivity* to refer to the orientation towards life one is forced to adopt as a result of "living in prognosis"[218] with toxicity. "Life" here refers to ways of living in relation to chemical infrastructures, of which we are already a part. For example, children in Bayview-Hunters Point have disproportionately high rates of asthma and senior populations have extremely high rates of cancer and heart disease,[219] which are illnesses that severely disrupt social reproduction[220] in the community. While appropriate steps are needed to remediate BHP to help ensure the health of subsequent generations, the prevalence of these chemical infrastructure-induced illnesses signal the urgency of finding solutions and alternative ways of being in the here and now, to ensure that social reproduction can continue even while biological reproduction is disrupted, in efforts to prevent the double death.[221] The term toxic subjectivity emerges out of my research of BHP. However, I broadly view it as a hermeneutic for our (broadly defined) collective lives, which can help us attune ourselves to multiple forms of embodiment under the conditions of toxicity, in a

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[217] Michelle Murphy, "Alterlife and Decolonial Chemical Relations," *Cultural Anthropology* 32, no. 4 (November 18, 2017): 494–503, https://doi.org/10.14506/ca32.4.02.
[218] Sarah Lochlann Jain, "Living in Prognosis: Toward an Elegiac Politics," *Representations* 98, no. 1 (2007): 77–92, https://doi.org/10.1525/rep.2007.98.1.77.
[219] Mitchell Katz, "Health Programs in Bayview Hunter's Point & Recommendations for Improving the Health of Bayview Hunter's Point Residents ," San Francisco Department of Public Health, September 19, 2006, https://www.sfdph.org/dph/files/reports/StudiesData/BayviewHlthRpt09192006.pdf, 8.
[220] Nathaniel Lewis, "Queer Social Reproduction: Co-Opted, Hollowed Out, and Resilient," Society and Space, October 31, 2017, https://www.societyandspace.org/articles/queer-social-reproduction-co-opted-hollowed-out-and-resilient.
[221] Deborah Bird Rose, "Multispecies Knots of Ethical Time," *Environmental Philosophy* 9, no. 1 (2012): 127-40, http://www.jstor.org/stable/26169399.

way that encourages broader engagement and more productive relations with our chemical infrastructures.

Building on feminist science studies, the conditions of possibility within toxic subjectivities exist in the ethical obligations and solidarities that individuals have with their broader community, both human and more-than-human, as a result of shared toxic subjectivities and as a mode of survival. Such a position does not foreclose the importance of remediating BHP, but extends the scope of remediation from the shipyard to the neighborhood as a whole, as residents have been advocating for. Moreover, this position is oriented around the sustenance of Black, and racialized and queer life. This stands in opposition to the ways of being dictated by our hegemonic regimes of perceptibility, which seek to remediate in order to restart primitive accumulation[222] and continue to impose conditions of toxicity on BHP's existing communities through the threat of displacement.

Future Directions

In future iterations of my research project, which I intend on continuing in graduate school, I plan on conducting a substantial number of interviews with residents, organizers, and state and private officials. I believe that interviews could have benefited my discussion on the subjective and affective experiences of toxicity. I attempted to gain some of this understanding through reviewing Greenaction's programs and actions, which provided useful insights into political formations as representations of the politics and values of BHP's communities (as seen in my analysis of IVAN's toxic mapping and environmental violation reporting program). However, by posing questions regarding, for example, how exactly people engage with Greenaction's programs, how toxicity disrupted their self or community's social reproduction, and what they

[222] Karl Marx, *Capital, Vol. 1,* (Penguin, 1976), 873-940.

believed to be in their sphere of ethical obligations in their environmental activism work, I could deepened my analysis of the more internalized ways that people were forming toxic subjectivities.

I also plan on flushing out my historical account of Bayview-Hunters Point. Currently, my history of the site predominantly focuses on the histories of Black communities in BHP from the mid-20th century onwards. However, I do not focus as heavily on accounts of the histories of the butcheries, shrimperies, and non-Black communities in BHP. A deeper analysis of this history would help me provide a more full picture of the site and its development, and elucidate some of the more contradictory ways in which racial capitalism extracts value from and dispossesses its racialized and gendered others.

My engagement with BHP to a degree was to analyze how the community's responses to conditions of toxicity could provide a model of living with toxicants in geographies that have not yet been so steeped in contaminants, like our very own community in the Berkshires. I attempt to capture some of the experiences and orientations of toxic subjectivity in my sound performance called *Breathing, 01/29/23*. My project includes a variety of found sounds from contamination sources in and around Williamstown , such as the PCB-containing Hoosic River, household products containing chemicals such as PFASs, fuel-burning vehicles, and other common sources of pollutants. I am also including sound bites from commercials and interviews with various environmental regulatory agencies, and industrial and commercial producers of these pollutants, to capture the fullness of our chemical infrastructures. My sound project attempts to engage more deeply with internalized formations of toxic subjectivity through channeling my own experiences. It is a product of insights from my research about ways of living with and

navigating around the toxic contamination already-permeating through our bodies to help tune us (residents of North County) to the chemical infrastructures of our geography.

With a more inclusive research methodology, deeper historical accounts, and a way to render the experiences of toxic subjectivity, I hope my research will be able to show how we can productively reorient ourselves to conditions of toxicity.