

CRUDE ASSEMBLAGES: HARM FROM OIL OPERATIONS IN THE ECUADORIAN  
AMAZON

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## ABSTRACT

Amelia Morel Fiske: Crude Assemblages: Harm from Oil Operations  
in the Ecuadorian Amazon  
(Under the direction of Margaret Wiener)

The Ecuadorian Amazon has been the site of intensive oil operations for the past 40 years, resulting in widespread contamination of the environment and health problems for the local population. Concerns about harm from oil have gathered a multiplicity of actors in this region invested in documenting oil's effects. Scientists and other researchers have sought to establish the relationship between oil contamination, chronic and acute disease, and environmental damage in this area. Despite decades of investigations, however, what counts as evidence of harm remains disputed and consensus has not been reached on the consequences of oil operations for those living in their vicinity. This dissertation demonstrates that what we call 'harm' from oil emerges and is given form in a highly contested terrain, and tracks how the experiences of those closest to pollution are written out of legal evidence and scientific studies.

Drawing on 24 months of ethnographic field research in the Sucumbíos and Orellana provinces of Ecuador, I examine the ways that a lawsuit and scientific studies – in conjunction with regulatory practices, artistic representations, environmental activism, political campaigns, industry archives, and my own ethnographic research and writing – constitute moments of intervention in which different actors work to establish, account for, or discount harm (*daño*) from oil. I show how harm is made to matter through such interventions, and demonstrate how

these practices are embedded in histories of inequality and hierarchies of knowledge production. Defining what counts as harm in light of contemporary oil extraction involves high stakes for all concerned; my dissertation argues for prevention and remediation in despite uncertain knowledge.

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## LIST OF ABBREVIATIONS

CEPE	Corporación Estatal Petrolera Ecuatoriana (predecessor to PetroEcuador)
EIA	Environmental Impact Assessment
FDA	Frente de Defensa de la Amazonía; Amazon Defense Front
PRAS	Programa de Remediación Ambiental y Social; Program for Environmental and Social Remediation
SOTE	Sistema Oleoducto Trans-Ecuatoriano; Trans Ecuador Oil Pipeline System

## INTRODUCTION

***Memo: Suppose I told you to go into a forest and find something...***

In 2004, Dave Russell, civil and chemical engineer at Global Environmental Operations, Inc. of Atlanta, Georgia, sent a memorandum to Steven Donziger, an attorney for the plaintiffs in *Aguinda vs. Texaco*, a lawsuit underway in Lago Agrio, Ecuador. The purpose of the memo was to explain the numerous difficulties of measuring petroleum hydrocarbons in a contaminated environment. Russell outlined the challenges facing the team of scientists:

27 December 2004

From: Dave Russell  
To: Steven Donziger

Memo: "Mid Course Corrections and the Scope of the Global Inspection"

... Suppose that I told you to go into a forest and find something, but I did not tell you what, but it will damage humans and the forest, but some of the damage may not be evident. Impossible, right? Well that's not quite right, but close. That's our task.

But, depending upon what we decide as evidence of the damage, our task may be even larger. Determine the damage. But what is the damage? Is it groundwater contamination, is it vegetation? Is it humans? In order to ask the right questions we must know part of the answers, and the cost and labor required for each approach with respect to obtaining that required proof. (pg. 2)

Russell's comment crystallizes the central problem of this study: What constitutes harm from oil operations? How is manifest? As Russell's note suggests, harm is not simply 'out there', waiting

to be found, measured, and documented. Rather, *what harm is* remains an open question at the heart of disputes over the effects of oil operations on life.

Ecuador began commercial oil production in 1972 under a joint venture with the Texaco and Gulf Companies of the United States. Following the conclusion of a 20 year contract, a team of lawyers representing a class of 30,000 Ecuadorian people who had lived within the concession area during the consortium's operations brought a lawsuit against the Texaco Company for damages to the environment and human health.

At the writing of the memo, some 12 years has passed since Texaco had stopped operating and left the country. During that time, the Chevron Corporation had acquired Texaco in a \$45 billion merger, making it the 4<sup>th</sup> largest oil company in the world at the time.<sup>1</sup> In 1993, the Ecuadorian state oil company had taken over all former Texaco operations, in an area roughly the size of Rhode Island. Donziger had hired Russell to manage the Ecuadorian Evaluation Team, a group of scientists and technical experts who were in charge of conducting inspections of soil and water on behalf of the plaintiffs during the fact-collecting portion of the lawsuit. Russell had been working for about 6 months in preparation for inspections of the sites, and he was concerned that the inspections required a more precise definition of what the team was looking for: what counts as evidence of damage?

Harm has been and continues to be the subject of great dispute in the Amazon; it is difficult to find any account of how oil operations have proceeded in this region that is not hotly disputed by residents, scientists, lawyers, oil company workers, state officials, and environmental activists alike. There is neither expert nor public consensus about the nature or extent of damage that results when hydrocarbons and the chemicals used in oil production enter a particular

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<sup>1</sup> The merger occurred in 2001.



environment, nor about the ways that oil operations change political and social dynamics in the places they operate. Further, while particular chemicals have been established as toxic to human health and to life forms in surrounding ecosystems, oil operations bring a complex of political, economic, social and environmental changes that in turn affect how populations are exposed to toxins, and how polluted sites are addressed. As a result, in a case such as operations in the Ecuadorian Amazon, it is difficult to parse which changes are reverberations from oil operations, and which are a result of other processes, such as land settlement or lack of adequate health infrastructure.

At stake in the controversies surrounding oil contamination in Ecuador are not only the scientific facts of how pollution affects people and places, but also an 18-year legal dispute, the continued oil operations led by the Ecuadorian State and other companies, and the experiences of those farmers, indigenous nationalities, and residents who lived through the early decades of oil and continue to live alongside oil operations today. By delving into the controversies surrounding the nature of harm, this study follows the work that is required to make harm real by different actors. As I will show throughout this text, harm is given form through specific practices, which have important consequences for public and expert evaluations of how harm comes to ‘matter’ in different political, economic, or social forums.

I begin from the premise that the controversies surrounding oil operations in the Ecuadorian Amazon are not due to the difficulty of scientific detection, or a result of economic, political, and corporate investments in oil operations, but remain matters of public and expert dispute precisely because what constitutes harm is not settled. Contrary to what one might expect, as Russell writes in his memo, harm is not obvious or given. Harm emerges through associations that bring chemicals and bodies into relation, that link industrial operations to the

rhythms of daily life, within the particularities of how this place in the Amazon came to be. Harm from oil operations is about the sticky materiality of crude and the vulnerability of bodies as much as it is about the political-economic relations that make and sustain our lives. My intention in this text is not to settle the question of “what is harm?” but rather to use these controversies as productive points of departure (Latour 2004) into the ways that the consequences of oil operations are made real, understood, and redressed.

What counts as harm has important consequences for everyday life in this part of the Amazon. Throughout this text, I follow the ways that different actors went about making harm real, material, or visible. These range from expert practices involved in environmental regulation to the rhetorical means lawyers used to argue that pollution was evident, as well as techniques such as digging up buried crude for visitors on “toxic tours.” I understand these various practices – some which speak to the past operations under the Consortium, and others that deal with ongoing oil operations by the state and other companies – to be interventions into the matter. These practices give harm weight. They turn samples of soil into objects that can speak for contamination across an area the size of Rhode Island, or delimit what does *not* count as damage – including contentious issues such as deforestation or cultural change. Such interventions are consequential because they are used not only to determine past accountability, as in the *Aguinda* case, but also to make decisions about how oil will be exploited in the future as debates continue about extraction in Ecuador. Thus, what I term the ‘making of harm’ and will explore throughout this text is a critical and open concern that bears on how life will be lived in the Amazon in coming decades.

### ***What is harm?***

When oil makes the news, it is often in relation to a violent explosion or burst pipeline. While there have been and continue to be oil spills, explosions, and other dramatic moments of rupture in this region, images of disaster obscure the face of daily life for those living in the vicinity of extractive activities. While news and popular media often present disasters as exceptional moments of crisis, anthropological scholarship has shown that disasters are both processes and routine (Ott 2008; Jones and Bushell 2009; Auyero and Swistun 2009). Disasters are part of a “cascade” of prior and subsequent events (Hoffman and Oliver-Smith 2002; Button 2010), rather than bounded moments of calamity (Redfield 2005; 2006; Hoffman 2010; Oliver-Smith and Hoffman 1999; Lakoff 2010; Lovell 2011; Fortun 2001). This text makes an ethnographic contribution to public and anthropological scholarship of disaster by examining how harm is made and experienced in everyday life; harm involving the quiet onslaught of industrial pollution rather than the explosive moment so common favored by disaster narratives. To focus only on catastrophic events is to ignore the ways that global demand for fossil fuels has fundamentally changed the lives of those living alongside the sites where they are obtained.

To understand the transformations of life wrought by extractive industries today, we must be attentive to what Nixon terms slow violence, a “violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all... [it] is neither spectacular nor instantaneous, but rather incremental and accretive, its calamitous repercussions playing out across a range of temporal scales” (2011, 2). A slow spill has its own power, one which is not necessarily weaker than an eruption. Following Nixon, this text is calibrated to the mundane rather than the spectacular, with the aim of complicating assumptions about harm as bound by

event, time, or body.<sup>2</sup> Consider these three vignettes taken from my fieldwork to illustrate what I mean by the range of ordinary moments that comprise life in the northeastern Amazon:

A roaring gas flare towers overhead, the ground beneath a blackened shadow of charred detritus. A black dust beneath my feet. Leaning over for closer inspection, I find it is made of the crumpled bodies of hundreds, thousands, of insects that had been unable to avoid the call of the flare in the darkness. I walk to the edge of the clearing. Here, in the flare's immediate vicinity, the leaves of the trees are speckled with fine droplets of shiny black. I am reminded of Lidia who, when describing to me what it is like to live next to a gas flare, described the impossibility of drying laundry outside her house: *Imagine*, she said, speaking of the clothes ruined when mistakenly left on the line, *this is the air we are breathing*.

Another day. Today I am on a trip with technicians from the local branch office of the Ministry of the Environment to follow up on a spill that resulted from a tank that separates crude oil from gas and water one day prior. Upon arrival, we find the swamp beneath the platform saturated with ooze, the tree trunks glazed from a receding tide of crude. Making our way through the brush, the company engineer indicates with a pointed finger the absorbent plastic booms that oil workers have placed across the stream

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<sup>2</sup> The full quote is as follows: "By slow violence I mean a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all. Violence is customarily conceived as an event or action that is immediate in time, explosive and spectacular in space, and as erupting into instant sensational visibility. We need, I believe, to engage a different kind of violence, a violence that is neither spectacular nor instantaneous, but rather incremental and accretive, its calamitous repercussions playing out across a range of temporal scales" (2011:2)

draining from the swamp to contain the spill. We stand, watching as iridescent trails of oil swirl, floating onward nonetheless. The farmer accompanying us, whose land the stream runs through, and who has seen many spills since moving here in the 1980s, points to the water travelling downstream beneath the boom: *And now, what will I give my cows to drink?*

Or, the next province: a decades-old old spill site, now under remediation. A team of community members, employed by the oil company for this job, are waist-deep in murky water. Two men hoist power hoses over their shoulders, scouring the mud. The old crude lodged in the mud releases under the blast. Watching from the bank, my nostrils sting from the smell. Only the two workers operating the hoses wear masks. Further downstream, another team of workers armed with shovels and improvised sieves scrape the accumulating fat of crude off the surface of the water and dump it into a waiting barrel. This remediation work has been going on for more than a year now, and these jobs are coveted. Yet, the more they hose the mud, the more oil comes out. *How clean is clean enough?*

At times harm from oil in the Amazon is visible, palpable, and apparent. At other moments it is uncertain, shifting, or hard to track: Is a child's asthma a result of the gas flare nearby? Are the declining yields of cacao trees reported by farmers due to contaminated soils? Is intestinal distress merely a consequence of poorly treated water or an effect of exposure to industrial toxins? As in these examples, throughout this text I intentionally focus on the ordinary rather than spectacular aspects of oil extraction. I argue that in order to understand the

consequences of a reliance on fossil fuels, we must be as closely attuned to leaching and dispersion as to gushes and eruptions. Places, industries, and lives are entangled. By following the seepage of oil beyond bounded events, bodies, and environments, the entanglements within which harm emerges become more evident. In doing so, this project contributes to the thinking about extractive industries whose consequences are insidious, habitual, and perhaps, more difficult to redress.

While diverse bodies of literature have investigated harm as a product of some other phenomenon, little attention has been paid to practices that involve the making of harm itself. A central feature of the controversies in the Amazon is the uncertainty surrounding the relationships among oil, harm, and life forms. Scientific evidence about the effects of contamination – such as how hydrocarbons are absorbed into bodies through food, correlations between specific toxins and diseases, or “safe” levels of toxin exposure – are matters of ongoing expert and public dispute. While uncertainty is a feature of all scientific practice (Latour 1988; Shapin 2010; Cranor 2008; Button 2010), industrial pollution is often compounded by corporate representatives’ denials of danger and presentation of contested scientific information intended to “bewilder” the public (Nixon 2011). Medical ethnographers have shown that this uncertainty over where and how harms originate, particularly those involving human health, is itself damaging (Auyero and Swistun 2009; Auyero and Swistun 2007), yet harm itself is rarely the object of inquiry.

The matter of how to redress harm is also not self-evident. Following oil spills or pipeline ruptures, state and company representatives may legitimate certain harms. Anthropologists have examined how processes intended to compensate those who have been injured can result in a reiteration of harm as a result of misalignments between victim classification and lived

experience (Fortun 2001; James 2010; Fassin and Rechtman 2009), particularly when scientific uncertainty is mobilized to delegitimize particular victim claims. In the Amazon, various investigations have sought to certify the relationship between environmental contamination from oil and harm to human health (San Sebastián and Córdoba 1999; 2001; 2004; Hurtig and San Sebastián 2004; Kimerling 1991; Kimerling 1995); however such studies remain controversial and inconclusive. While scholars, journalists, and activists often seek to eliminate uncertainty from their accounts of harm and oil, in this study, I approach uncertainty as a constitutive feature of harm.

I aim to raise questions about how the products of different interventions – numbers, facts, and images – participate in making harm real. Scholars have demonstrated that practices of quantifying and documenting shape fundamental understandings of self and society (Urla 1993; Alonso 1987). Drawing on scholarship in science studies, in this text I build from the premise that the facts of harm do not simply exist in “nature,” awaiting measurement or discovery. Rather, as Latour argues (1999), facts become real precisely *because* they are constructed. One particularly relevant form of construction involves imaging technologies such as aerial photography (Daston and Galison 2010; Haraway 1997). Imaging techniques historically have entailed a “view from nowhere” (Haraway 1988), which made invisible the contingencies involved in making the image or the kinds of viewers and scientists that images produce (Daston and Galison 2010). Others, such as Lynch and Woolgar (1990) have argued that the production, presentation, and use of visual representations in science do not involve ‘natural objects’ separate from cultural processes or literary forms; instead, such representations are repositories of social actions. To take this point further, images are not only generated by and reflective of human concerns, but are products of the entangled relations of humans and nonhumans – in this text not

only aerial technologies but also things such as lenses, chemicals, and more (Latour 1999; 2004; Mol 2002). I draw on this work in making harm the subject of this ethnographic investigation, paying close attention to the tools and technologies used to intervene in harm from oil, as well as the objects (reports, maps, images, numbers) that result from these projects. In particular, I take methodological inspiration from Mol (2002), who shows that by attending to practices of intervention what we think of as a single object (such as harm), may in fact be multiple.

### *The field*

The field research for this text took place over 27 months between 2011 and 2013. Throughout this time, I lived in the city of Nueva Loja – most commonly known as Lago Agrio – located some 15 miles from the Colombian border in the northeastern corner of the Amazon. The city marks the site of the first exploratory wells drilled by the Texaco Company, from which they first struck ‘black gold’ in 1964. Lago Agrio, which translates as “sour lake” in English, was reportedly baptized as such by Texaco workers who named it after Texaco’s hometown in Sour Lake, Texas.<sup>3</sup> I conducted research throughout the provinces of Sucumbíos and Orellana. These two provinces comprise the original oil concession operated by the Consortium, and are the most heavily exploited area of the Ecuadorian Amazon in the past 50 years.

There are several reasons why I chose to situate my study in these two provinces, and in the area surrounding Lago Agrio in particular. First, contrary to popular imaginaries of the Amazon as a pristine rainforest, this is a region that is as industrialized as it is natural. Writing against the idea that the Amazon was previously a space of ahistorical nature, working in this place has allowed me to examine how harm has emerged within historic entanglements of nature,

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<sup>3</sup> The official name of the city, Nueva Loja, was chosen by the group of settlers who came to the city from Loja in the southern highlands. Today it is most commonly referred to as Lago Agrio.



industry, and politics. These led to forms of life that proved especially vulnerable to the impact of oil contamination. Second, the city of Lago Agrio not only has become emblematic of the oil industry in Ecuador, but was the judicial seat of the *Aguinda v. Texaco* lawsuit throughout the 2000s, and has featured in many subsequent news reports, documentaries, and environmental activism on oil, making it a productive point of departure.

Over the course of fieldwork, I participated in a range of activities that brought me from Lago Agrio down the length of the Napo River to the border with Perú, as well as to the cities of Shushufindi, Sacha, El Coca, Tarapoa, and communities in between. I sought out individuals living outside the cities, most of whom were *campesinos*, to understand their experiences living alongside oil operations. I spent time with them and their families, and asked them to tell me about their farms, their memories of early decades in the Amazon, their experiences working for oil companies or participating in meetings of the plaintiff organization for the *Aguinda* case. I interviewed participants and observed the work of environmental organizations, in particular the Frente de Defensa de la Amazonía (Amazon Defense Front; FDA), and Selva Viva, both of which are affiliated with the plaintiffs and located in Lago Agrio and El Coca, and participated monthly in the Escuela de Líderes (Leadership School) run by the FDA. Through time spent with these organizations, I made connections with individuals who were active in environmental organizing or who had travelled to the US to speak on behalf of the plaintiffs, with whom I conducted a series of interviews. With one of these individuals, a man who features repeatedly in the following chapters, I spent considerable time observing as he lead “Toxic Tours” for groups of students, journalists, lawyers, and visitors.

From the intimacy of homes and time spent in spaces of learning and advocacy, participant observation also took me to technical and expert spheres. In order to understand how

environmental regulation of the industry operates, I sought out local government officials, technicians from the Ministry of the Environment, and officials based out of Quito, and observed on site visits to oil spills, inspections of routine operations, and community meetings where Environmental Impact Assessments were presented to communities. I spent time interviewing chemists, biologists, and environmental engineers employed by environmental consulting companies, many of whom had previously worked in the industry. I spoke with former oil engineers in order to understand how oil operations have changed over time, how the regulatory apparatus operates on a day-to-day basis, and the investigations that they and others have undertaken to document or measure changes in forest cover, bird populations, or human health. I accompanied these individuals as they did their work – such as on trips to measure heavy metals in the fatty tissue of fish or inspections to collect soil samples – in order to track how contamination was made palpable. I also spent time in laboratories to understand the technical processes of testing for hydrocarbons in soil or water samples, and interviewed technicians on issues such as the processes of remediating an oil spill.

Due to personal interest in the visual aspects of contamination, I spent time with artists and photographers as well as with scientists working with aerial images. Although many of these accounts have not made it into this text, they informed my understanding of the range of efforts to make harm visible. This included spending time with a Cuencan artist who documented the return of a vial of contaminated water from a well in the Amazon to Sour Lake, Texas. Or, on another occasion, I spent a month with a photographer making a photo essay on the effects of oil on daily life in an indigenous community. I sought out art and photography exhibits on oil contamination in Quito, paying close attention to the ways that harm was represented visually.

Many of these artistic endeavors were closely tied to environmental activism; it is my intent that they will make it into a later iteration of this work.

Living in Lago Agrio allowed me to observe dynamics of the city, from the daily rhythms of oil workers and government officials, to the many NGOs that operate in the region working on issues of health, security, violence and more. While the majority of time was spent in the Amazon, I also made many trips to Quito where I pursued historic sources ranging from newspaper articles from the 1960s and 1970s covering the initiation of drilling and the opening of the oil pipeline, to the official records from PetroEcuador and the Ministry of the Environment. Many of the interviews I conducted with government officials took place in Quito.

Over the course of this research, I sought to understand these various activities as interventions in the matter of harm. A lot of work is required for something like a waste pit or polluted soil to become an object that can be mobilized as ‘harm:’ historical documents, photographs of crude, laboratory tests for hydrocarbons, lawyers, farm animals that have become ill after drinking water draining from its banks are some of the many actors that must be assembled in order for something like a waste pit to become a robust form of harm. All practices of intervention, including the writing of this text, are as partial as they are situated. What I hope to illustrate throughout this text is that all of our mechanisms for apprehending harm – from the scientific to the legal to the informal or social – are highly contingent. No singular means can capture what oil does to people and places.

Other work on oil in Ecuador has focused on the *Aguinda v. Texaco* lawsuit. The lawsuit is certainly relevant to the ongoing impact of oil in the area, and to practices that aim to demonstrate or refute the reality of harm. The *Aguinda* case has largely been painted in popular media as concerns of polarity: truth versus fiction; objective versus subjective accounts; David

versus Goliath. My approach differs. By treating harm as undetermined, I open up the question of what constitutes it and illustrate why answering this question has proved so difficult. But I also go beyond the lawsuit, through an ethnography of life with oil over the 50 years since the initiation of the industry.

While I was in the field,, the *Aguinda* trial concluded and a lengthy appeals process began. At the same time, state oil operations expanded via PetroEcuador (now PetroAmazonas), and President Correa made the contentious decision to end the Yasuní-ITT initiative – a notable environmental proposal to keep oil in the ground in one of the most remote portions of Amazonian jungle. These events feature throughout the text. It is because of the continued vigorous debate on the costs of oil operations in relation to its benefits (in terms of revenue) that I argue that harm demands an approach that is not limited to one company's operations in the past, but rather encompasses the complexity of political and economic interests that continue to shape its extraction today. As oil operations expand into increasingly remote sectors of the Amazon, closer attention to what constitutes harm is necessary. The means by which we – as citizens, scientists, activists, academics, authors – intervene in harm affects how we subsequently evaluate and work to alleviate the industry's effects and their many reverberations.

Throughout the chapters, I aim to demonstrate what ethnography offers as a way to address these issues. One way in which I have done this is to use long excerpts of interviews in order to convey the concerns, humor, and particularity of the speakers. This is to retain the voices of the people who shared their time with me, and to try and evoke a sense of life in the Amazon, a place that may be geographically and personally distant for many readers. But this attention to the everyday is also an intentional effort to provide a different sort of account than the ones that are found in popular media of this place. By emphasizing everyday life alongside

oil, I bring the reader's attention to the insidious, even boring, features of life in places where our fossil fuels come from. Beyond spills and explosions, it is these quotidian moments in places of extraction that fuel our lives.

The majority of names used in this account are pseudonyms, with the exception of public figures whose identity would have been impossible to conceal. In cases of quoted interviews with such individuals, I received their permission to use their names. In most examples I have changed locations or omitted details, so as to protect the identity of the people with whom I worked. Most of fieldwork does not make it into ethnographic writing; I recognize the political nature of the process of selecting the examples that I used in this text and the role of the author in crafting the story that is told. On more than one occasion, I have felt the responsibility that this implies. Once, while talking with an interlocutor with whom I worked regularly, I expressed my intent to return with drafts of chapters to receive her feedback. *Don't worry, she replied, I don't need to read it, I already know this story.* Yet, this account will never be her story. I want to be clear that while this text would not have been possible without the collaboration and generosity of Ecuadorian interlocutors, that I recognize the partiality of this text as well as its likely failings in their eyes. The concerns I raise are not the same concerns raised by my interlocutors; most notably, for many of the farmers living in the Amazon, harm was not questioned but real. In writing this text I continue to grapple with the political stakes that come with declaring what harm is, or is not.

### ***Extractive histories***

The Amazon is often presented as the epitome of nature, the "lungs of the world," a wild frontier where indigenous people live in timeless harmony with the forest. A place of wonder,

Amazonía has been imagined over the centuries to hold answers to questions about the origins of humanity, the secrets of life, or the salvation of the future in its natural abundance.

The northeastern corner of the Ecuadorian Amazon does not match these fantasies. Oil pipelines run alongside roads that were built for oil exploration. Gas flares light up the immense industrial complexes of the processing stations at night. Wells and wastepits are scattered throughout the jungle. After more than 50 years of oil production here, oil activities and infrastructure have become a part of life, yet another feature of the landscape. The idea of industry in the Amazon has been a public flashpoint since the rise of the environmental movement in the 1960s. Describing responses to the destruction of Amazonian forests in Brazil some 3 decades ago, Hecht and Cockburn wrote, “What imbues the case of the Amazon with such passion is the symbolic content of the dream it ignites” (1). Oil in the Amazon arouses horror in part because of the perceived unnaturalness of oil operations in a place that is synonymous with Nature.

It is tempting to see the arrival of oil as marking a break between a pre-industrial paradise and a capitalist nightmare. Indeed, the oil industry has brought a dramatic change in both the scale and speed of transitions in Ecuador. However the current formations of extractive industry in the Amazon – principally oil, but also African Palm plantations to produce palm oil, and illegal timber cutting – continue a pattern of short-term profit and foreign interests that date from the 17<sup>th</sup> century (Fontaine 2007, 251).

The past half-century has marked a dramatic transformation of the northeastern region of the Ecuadorian Amazon. The interwoven processes of land settlement and oil development are critical to understanding how these changes unfolded. Responding to land crowding in the Sierra and a drought in the southern highlands in the 1960s, government officials mistakenly equated

abundant jungle flora for rich agricultural soils, and thus saw in the vast territory east of the Andes the nation's next breadbasket. At the same time, Ecuador was on the brink of becoming an oil-producing nation. Politicians imagined that oil – through the infrastructure and revenue it would bring – would be a means of facilitating colonization of unconquered border territory. 'Black gold' was to herald an era of prosperity.

At the government's request, the Texaco-Gulf Company built roadways in the Amazon to facilitate colonization, which was more of a priority for the government than oil at the time. Through a state program called Agrarian Reform and Colonization, settlers set out en masse to claim 50 hectares of land each, half of which they were required to make "productive" through planting crops or cattle ranching in order to receive land title. Many of them were mestizo farmers from the southern highlands.

On 21 February 1964, the Ecuadorian state granted a Concession of more than 1 million hectares to the Texas Petroleum Company, which was later reduced twice to the 497,301 hectares which formed the Napo Concession (Zambrano Lozada 2011, 92). The concession was to be operated by a consortium formed between Texaco, Gulf, and the nascent Corporación Estatal de Petroleos de Ecuador (Ecuadorian State Petroleum Company; CEPE). In October 1965, Texaco and Gulf delegated their work to a subsidiary company, Texpet, which executed operations under Ecuador's supervision.

In March 1967, one of Texaco's exploratory wells near what is today the city of Lago Agrio hit the legendary black gold: "*Oil gushed in the East!*" declared national headlines. Oil exploration continued with fervor. By 1972, the 313-mile Sistema de Oleoducto de Transporte Ecuatoriano (Trans-Ecuadorian Oil Pipeline System; hereafter, SOTE) pipeline was completed, connecting fields in the Amazon to the recently completed oil refinery in Esmeraldas on the

Western coast. Over the next 28 years, Texaco drilled 339 wells and built 18 production stations, to extract an estimated 1.5 billion barrels of crude (Kimerling 2006a, 449).

The construction of the SOTE and the roadway accompanying the pipeline completed the route between Quito and Lago Agrio, greatly facilitating the movement of those seeking land into the Amazon's northern regions. All told, the processes of oil development and state-sponsored colonization resulted in the arrival of more than 200,000 colonists to the Amazon, who claimed more than 4,500,000 hectares of land (Sawyer 2004; Lucero 2008). In less than 4 decades, satellite imagery from the year 2000 showed that more than half of the *Oriente* region had been deforested, covering 240,888 hectares of forest (Southgate, Wasserstrom, and Reider 2009, 2).

The 20-year contract designated Texaco as the consortium's operator in the Napo Concession, the name of the oil block the company operated.<sup>4</sup> Texaco, as the technical manager and executor of the operations, was in charge of the design, construction, installation, and operation of the infrastructure and equipment necessary for the exploration and exploitation of petroleum until June 1990. Designating one actor in a consortium as operator was, and continues to be, standard industry practice in OPEC countries. During most of this period, Texaco owned 37.5% of the consortium and PetroEcuador 62.5%. OPEC designed agreements such as these to promote national development of oil reserves: ideally, foreign companies would develop oil

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<sup>4</sup> The Napo Concession is the parcel of land granted to the Consortium by the Ecuadorian State at the beginning of operations. The exact dimensions of the Concession were adjusted several times throughout the 20 years of Texaco operations.



fields with existing technology and then turn them over to the budding state company after twenty years.<sup>5</sup>

In the years following the consortium's formation, Ecuador raised royalty and tax rates on Texaco earnings from 44.4 to 87.3% by the mid-1970s. In 1977, Gulf Oil left Ecuador and PetroEcuador bought Gulf's shares, giving the state a majority stake of 62.5% which they retained for the rest of the consortium's contract (Barrett 2014b, 25). Texaco's share remained 37.5%. Luis Alberto Aráuz, the former general council for CEPE and author of a 900-plus page text entitled *Ecuadorian Oil Law*, estimates that the Ecuadorian government made \$23.5 billion and Texaco \$1.6 billion during operations (Aráuz 2009, 428). Chevron maintains that the company made only \$490 million after taxes from a \$25 billion venture (Patel 2012, 10). Although those involved dispute the exact figures, these numbers indicate the tremendous wealth generated. Most of it was captured by political and economic elites in Ecuador and Texaco (Aráuz 2009; Barrett 2014b).

In June 1992, the Texaco Concession had expired and all of the fields were turned over to PetroEcuador. Following Texaco's departure, Fugro-McLellan and Woodward Clyde Consultants performed environmental audits in order to document the state of the Concession.

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<sup>5</sup> The OPEC model sought to promote national sovereignty through extraction of natural resources. "Risk-Service Contracts" stipulated that the foreign company be paid back for all expenses associated with development and exploratory drilling during the first five years. Over a period of 10 years, expenses associated with constructing infrastructure (generally much greater than the costs of exploration) would also be paid back. Throughout this time the state company would receive a percentage of the revenues, which would grow until reaching a pre-determined revenue split. In most cases this meant a 65/35 split, with the state company receiving 65% and the foreign company 35%. The oil company would then be responsible for paying taxes and royalties, however, so that ultimately in the case of Ecuador the split was closer to 85/15. The contract that Texaco had with the Ecuadorian state was standard for OPEC countries at the time, with the company receiving a 12-15% rate of return on investment. Stipulations in the contract required hiring and training national professionals, with the idea that operations would switch to the state after 18 years, and the minority partner would leave completely after 20 years.

Texaco then entered into negotiations with Ecuador to reach a remediation agreement. Based on these audits, the government drew up a list of sites in a settlement agreement that included a \$40 million plan for environmental remediation for 37.5% of the sites identified as contaminated, corresponding to Texaco's percent of ownership.

In 1995, Giovanni Rosanía, then Deputy Minister of Energy and Mines and a former employee of the Texaco-PetroEcuador consortium,<sup>6</sup> signed a "Remedial Action Plan" with Texaco, making the company responsible for remediating 133 well sites and 7 spill areas. The remaining 200-plus contaminated sites would be PetroEcuador's responsibility. Texaco negotiated the terms of the remediation, setting 5,000 Total Petroleum Hydrocarbons (TPH) for soils as the limit, some 50 times more toxic than US standards at the time, and five times more toxic than Ecuador's. The agreement did not specify any action to be taken on contaminated waterways, or provide for costs of treatment for people affected by contamination (Barrett 2014b, 56).

The remediation proceeded over the course of the next three years. The final act of the agreement, signed on 30 September 1998 by the Ministry of Energy and Mines, PetroEcuador, and the Texas Petroleum Company, stated that the Ecuadorian government agreed to "free, absolve, and discharge the Exonerated of any suit or claim ... for obligations taken on by Texpet in said contract" (Zambrano Lozada 2011, 32). This agreement would later prove to be a major point of contention in the *Aguinda* lawsuit, in which Chevron would maintain that the entire lawsuit was invalid. Ultimately in his 2011 judgment, Judge Zambrano ruled that the release did

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<sup>6</sup> It was common for officials to hold positions in both state and foreign companies, as well as to have ties in the industry and in remediation companies. These arrangements have raised many concerns about the independence of regulatory, remediation, and operating bodies as well as about collusion between state and foreign company officials.

not exclude the possibility of Texaco's liability to third parties, such as the plaintiffs (Zambrano Lozada 2011, 31).

Although approved by the state, many did not accept the remediation work as sufficient. Lawyers, scientists, and activist groups insist that the cleanup was both inadequate and fraudulent. On many sites within the Concession, no action had been taken at all because they belonged to PetroEcuador. Throughout the remediation period, PetroEcuador administered funds from Texaco, subcontracting the remediation to other companies, many of which had PetroEcuador officials as silent owners. Upon reviewing the report of the remediation process, William Subra, a US based chemist knowledgeable about remediation of oil fields, commented to Judith Kimerling, a prominent attorney and academic who has written extensively on the case, that "they really did not do much" (Kimerling 2006a, 502).

The persistence of contamination from the Texaco era is a subject of a frequent dispute the Amazon today. Administration of the \$40 million for remediation was so badly mismanaged that a large portion of the funds was diverted into the pockets of sham companies unqualified to do the work, many of which had personnel in collusion with the state company. During my fieldwork people often showed me the crude oil and chemical by-products remaining in the soils and streams at former Texaco sites in order to demonstrate that the remediation was a sham.

For two decades, the consortium had operated with minimal oversight under a "gentlemen's agreement" that informally governed the industry in Ecuador. Reports by workers and residents of routine operations include the open burning of waste pits and direct dumping of production waters into streams. Those who lived in the Amazon in this time note that the rivers ran black with oil. In the 1990s, environmental concern was growing with the initiation of the *Aguinda* lawsuit and increasing efforts to improve regulation of the oil industry. After a series of

regulatory initiatives over the course of the decades, in 2001 the *Regulation to Replace the Environmental Regulation for Hydrocarbon Operations, Decree No. 1215* was put into law.

1215 is the same regulation that is currently employed today.

The government owns all subterranean oil reserves in the country. As a result, as both operator and regulator, the state has a pre-determined investment in oil. Although Ecuador is a small oil producer both regionally and globally (ranking 5<sup>th</sup> in Latin America and 27<sup>th</sup> worldwide (CIA 2014), oil's importance to the national economy is significant. Petroleum constitutes 59.2% of Ecuador's total exports (CEPAL) and funds a quarter of the national budget (Herrera, López and Arias 2012). At present, 65% of the Amazon has been zoned for drilling (Finer et al. 2008). Increasingly, oil and mining projects are run through lending deals from the Chinese government that are to be repaid with oil and minerals (N. Gill 2015). Concerns over the future of oil in the Amazon are linked to a broader set of political divisions over the role of extraction in relation to the Ecuadorian state.

The oil industry and processes of colonization and settlement worked in tandem to transform what was once rainforest. The state and the oil industry directly and indirectly enabled the current configuration of roads, settlement, and fields of cacao, yuca, and plantain that have since transformed the region. It is within this fabric of place that oil and life have unfolded. I argue that it is not possible to understand exposure, toxicity, the *Aguinda* lawsuit, or environmental regulation without tracing how this place was made and the implications of that for harm.

### *Aguinda v. Texaco*

Returning to the case that opened this text, on the 14<sup>th</sup> of February 2011, at the Provincial Court of Justice in Sucumbíos, Judge Nicolas Zambrano Lozada offered his decision in *María Aguinda et al. v. Chevron Corporation*. The decision came after 8 years of litigation in Lago Agrio, and 18 years after the initiation of the suit (Kohn et al. 1993). Filling 189 pages of block text, without a single paragraph indentation to guide the eye, every odd page is meticulously initialed for legitimacy. The sprawling document summarizes more than 200,000 pages of court records. Judge Zambrano found Chevron liable for contamination for a total of \$8.6 billion in damages. The ruling marked the largest civil penalty awarded in history. In a twist unknown in US law but recognized by the Inter-American Court of Human Rights, Zambrano ordered that the amount be doubled if the defendant did not publically apologize to the plaintiffs as a gesture of moral redress within two weeks of the Sentence.<sup>7</sup> Chevron did not apologize.

The *Aguinda* case has made the *Oriente* region famous. The original complaint, signed by 76 indigenous and mestizo farmers on behalf of an estimated 30,000 “similarly situated” people living within the Texaco Concession between 1972 and 1992, was filed in New York by Cristóbal Bonifaz, an American lawyer of Ecuadorian heritage in 1993.<sup>8</sup> The lawsuit claimed common suffering across a group of individuals of distinct Indigenous nationalities and origins. Texaco was accused of “wanton, negligent, reckless, intentional” acts that produced “property damage, personal injuries, increased risks of cancer and other diseases, and . . . resulted in the

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<sup>7</sup> The case later proceeded to the highest level of review in the National Court of Justice in Quito. In this final appeal, the doubling of the Sentence was eliminated.

<sup>8</sup> The class of plaintiffs was defined as follows in the original 1993 complaint: “All individuals who at any time from 1972 to the present reside in the region of Ecuador comprised by the area bounded on the North by Colombia, on the South by the Parallel at 1.5 degrees south of the Equator, on the West by the Meridian located at 77.5 degrees West of Greenwich England and on the East by the 76<sup>th</sup> Meridian west of Greenwich England.”

degradation and destruction of the environment in which the plaintiffs and their families live.”

The plaintiffs charged that these effects resulted from decisions taken for “economic gain to dump unprocessed oil into the environment, and thereby to expose plaintiffs and the class to toxic crude oil, and to benzene, toluene, arsenic, lead, mercury, hydrocarbons and other toxins, knowing that such substances were toxic to humans,” (Kohn et al. 1993).

The damages fell into three broad categories: environmental harm, harm to human health, and cultural harm. Cultural harm (*daño cultural*) was later eliminated. Specifically, the plaintiffs sought “[t]he elimination and removal of contaminating elements that continue to threaten the environment and the health of inhabitants ... The reparation of the resulting environmental damages, in accordance with article 43 of the Environmental Management Law” (Zambrano Lozada 2011, 2).

In initial proceedings in New York, the court focused on a jurisdictional dispute: was the United States the appropriate site for the suit? Texaco argued that the case should be tried in Ecuador because operations had taken place there, while the plaintiffs asserted that because operational decisions had been made in the United States, New York was the proper location. Chevron denied “all grounds of fact and law of the lawsuit,” rejecting claims that the company had caused any damage, committed civil crime, or could be held guilty of malice or negligence. Once litigation began in Ecuador, the company deferred responsibility to TexPet,<sup>9</sup> denied that Chevron had any obligations as Texaco’s successor, contested efforts to apply environmental legislation retroactively, and rejected the legal claim that the plaintiffs formed a common class.

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<sup>9</sup> Texaco denied parent company control over Texaco Petroleum Company (Texpet) operations, arguing that Texpet was a fourth-tier subsidiary and therefore constituted an “indirect investment” on the part of Texaco in Ecuador despite being wholly owned by the company (Kimerling 2006a, 485).

The following year, US federal court Judge Rakoff pronounced Ecuador the appropriate forum for the lawsuit under *forum non conveniens*, on the grounds that the case had “everything to do with Ecuador and nothing to do with the United States” (Kimerling 2013, 246). In May 2003, *Aguinda v. Texaco* was filed in the Superior Court of Nueva Loja.

In this lawsuit, the passage of time has played a crucial role. By the time litigation began in Lago Agrio, more than 10 years had passed since Texaco had stopped operating in Ecuador. In part due to the lawsuit’s transfer from New York to Lago Agrio and subsequent delays, when the fact-finding portion of the lawsuit began in Ecuador, the task was to ascertain responsibility for harm that had occurred in the past. The continued oil operations on former Texaco sites by PetroEcuador further complicated matters since it was now necessary to demonstrate not only the presence of contamination, but that it had resulted from operations under Texaco and not subsequent operations.

By the time the trial began, not only had Ecuador passed new environmental and industrial regulations but international standards had changed significantly as well. The court declared that norms specified by current regulations (including parameters for acceptable levels of contamination on industrial sites) could not be applied retroactively. Yet, because Ecuador did have some regulations in the 1970s and 80s, however insufficient they were, Judge Zambrano declared that it was generally considered “prohibited to discharge solid or liquid gas residues into the air, soil, and water without prior treatment to make them harmless for health” (Zambrano Lozada 2011, 96).

The Judge’s 2011 decision has not brought the case to a close. Because Chevron no longer has any holdings in Ecuador, the *Aguinda* sentence could not be executed there. As a result, the plaintiffs have taken the case to countries where Chevron has operations (such as

Argentina and Canada) seeking a ruling by a third-party court to claim the financial settlement. Whether or not the plaintiffs will ultimately be able to collect the settlement remains to be seen. In the years since the 2011 ruling, there has been a lengthy appeals process, including several additional lawsuits in which Chevron sued the Ecuadorian state for interference in the *Aguinda* legal process in the Hague International court, as well as a successful RICO (Racketeer Influenced and Corrupt Organizations Act) lawsuit brought by Chevron against plaintiff attorney Steven Donziger for fraud in 2014. The RICO case is presently under appeal by Donziger.

Given the lawsuit's duration and international notoriety, it is impossible to write about oil in the Ecuadorian Amazon without taking the *Aguinda* case into account. Indeed, many of those whom I met who were invested in documenting oil's effects are associated, or formerly were associated, with the lawsuit. Many current employees of oil companies, state regulatory agencies, or private laboratories also were also previously involved in, or affected by, the suit. Moreover, despite its conclusion, the lawsuit continues to make international news and to serve as a reference in national politics. Activists struggling to preserve reserves in the Amazon cite Texaco's legacy as a cautionary tale, while President Correa blames Texaco for criminal acts in order to argue that contemporary oil operations by the state are fundamentally better than those of the past. Thus, though the *Aguinda* case is not my focus, the lawsuit and its legacy shapes investigations of harm, contamination, oil, and the environment.<sup>10</sup>

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<sup>10</sup> This discussion serves as background for what follows. Others have written extensively on *Aguinda* (Kimerling 2013; 2006b; 2006a; 2002; 2001; 1995; 1994; 1991; Sawyer 2008; Valdivia 2007; Barrett 2014b; 2014a; 2013; Acosta 2011; Langewiesche 2007; Alexander 2014; Patel 2012) as well as on oil extraction in Ecuador more broadly (Sawyer 2004; Bass et al. 2010; Beristain, Páez Rovira, and Fernández 2009; Bustamante 2007; Jochnick et al. 1994; Hurtig and San Sebastián 2005; San Sebastián and Hurtig 2004; Hurtig and San Sebastián 2002; San Sebastián et al. 2001; Fontaine 2007; Perreault and Valdivia 2010; Valdivia 2008; Finer et al. 2008; Finer et al. 2009; Larrea 2009; Canaday and Rivadeneyra 2001; McCracken and Forstner 2014; Southgate, Wasserstrom, and Reider 2009; Wasserstrom, Reider, and Lara 2011; Steyn



### *Un par de chozas: Sucumbíos and Orellana*

Today, what was once just *un par de chozas* – just a few shacks, as early settlers of Lago Agrio described it to me – is now a scrambling city populated by more than 100,000 people. The research for this study took place across a range of sites in the provinces of Sucumbíos and Orellana. In order to situate this account in the place where commercial oil extraction began in Ecuador, and to suggest the many ways that life has grown around and beyond oil, I begin with a description of Lago Agrio.

Most of the small cities and towns spread throughout Sucumbíos and Orellana are connected by roads originally built for oil operations. Lago Agrio, Francisco de Orellana (or “El Coca”), and Shushufindi mark urban hubs that buses link to surrounding areas. Outside of the towns and cities, the principal sources of income are farming, especially of cash crops such as cacao, corn, coffee, plantain, and commercial fish farming. Permanent positions working in the oil industry are hard to come by, but an extensive network of secondary or supporting industries exists in the form of restaurants, parts suppliers, hotels, and transport services that serve the oil complex.

At five in the afternoon, the second of two daily flights from Quito heads east to Lago Agrio. In contrast to higher altitudes where the land below is cavernous and dry, as one drops through the clouds over the Andes, the Amazonian basin forest spreads below. An immense green, through which fibrous brown rivers with sandy banks wind their way. As the plane descends, palms become visible, along with the red earth of roads cutting through the forest and

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2003; Aráuz 2009). Much information also has been published by NGOs such as Acción Ecológica and Amazon Watch, as well as by Chevron (Kelsh, Morimoto, and Lau 2009) [www.chevron.com/ecuador](http://www.chevron.com/ecuador); [www.chevrontoxico.com](http://www.chevrontoxico.com); [www.accionecologica.org](http://www.accionecologica.org); [www.amazonwatch.com](http://www.amazonwatch.com)).

cleared lots with felled trees like matchsticks. The stewardess announces the approach to Lago Agrio. Small clusters of zinc-roofed houses dot the main road, and soccer courts and speed bumps come into view, growing in density until the plane is cruising over the town. Lago Agrio emerges so suddenly out of the trees that it takes one by surprise.

Making a descent over the town center, one flies over the Via Quito, the taxis, street vendors, and usual commotion visible below. Because of the airport's proximity to town, with the end of the tarmack bordering downtown and the oil production station built by Texaco, no building downtown may be taller than four stories. No one imagined in the 1960s the size of the city that would grow in the decades following construction of an airstrip. As the plane nears the ground, huge oil storage tanks constructed by Texaco become visible, stacked like giant metal coins across the lawn. The gas flares behind them burns orange, becoming more visible as the light fades. A long fence, behind which sit rows and rows of pipelines, rusted and stacked like lumber. The sky is a soft blue gray and the air smells warm. Steam still rises from the afternoon rain; a deflated windsock sits in stillness. Through the trees one can glimpse the rig of a nearby oil well. Outside the airport, taxis idle as they wait for passengers. Drivers for oil companies pick up their passengers in oversized silver trucks. The road out of the airport curves, as nearly all roads here do, passing oil wells to the right and left before entering town.

Lago Agrio is a noisy place. Before six in the morning the heavy metal rolling doors of shops are thrown up, and water sloshes against the sidewalks as the floors are cleaned and readied. *Bolón con huevo frito* or the *Petrolero* combo, an oversized combination of steak, egg, yucca or plantain, over a mound of rice, are set out for breakfast along with jars of instant coffee on the plastic tabletops of restaurants. Oil workers, readily identifiable by their work boots and matching jumpsuits or full denim uniforms emblazoned with company logos and reflective tape,

fill the tables, the morning news running at full volume on the TV overhead. The flowered plastic tablecloths are sticky in the humidity. Outside, company pickup trucks line the sidewalk. Uniformed kids, hair neat and slicked into place, make their way to school. Adults hurry to work – in security companies, in workshops cutting glass, washing and repairing clothes. Vendors roam the streets selling wobbly towers of brooms, announcing a sale on ripe mangos from the back of their circling pickup truck through a loudspeaker, while others push carts stacked with freshly boiled quail eggs.

Afternoons are hot and slow, the parks full of young *novios* sitting in the shade. Families of four zoom by on overloaded motorcycles. Taxi drivers carry their soccer uniforms and cleats in the trunks of their cars, to be ready to play at 4pm when the game starts. As you walk down the street, shouts come from the *ecuavolley* courts – an Ecuadorian version of volleyball – squeezed between houses, surrounded by crowds of spectators, kids, food vendors, stray dogs. As dusk falls, the roasted plantain vendors roll out their carts. The yucca bread seller returns for his afternoon route, zigzagging around potential buyers while shouting ‘*Pan de yuca, pan de yuca, pan de yuca y café!*’ punctuated by his metal whistle. Women set rolling carts outside of karaokes and bars, and grill various chicken parts.

The sounds of praise echo from evangelical churches and bible studies; as one neighbor commented to me, *For every chongo here, you’ll find two evangelical churches on the same block*. On weekend afternoons the parks and central plaza fill with families and kids sticky with ice cream; others pack up for a day on the banks of the Aguarico, spending hours in and out of the cold, fast water. The banks of the river are piled with crates of beer, roasted chicken, and salsa *a todo volumen*. Frequent downpours make a good excuse to wait at home. The streets fill with inches of standing water in minutes, the thunderous noise on zinc roofs drowning out

conversation. Roosters crow at all hours, day and night. In the relative calm of evening, the strains of men drinking too much beer in the local karaoke travel down the street; the melancholy sound of old boleros and the chintzy twine of bachata fills each corner.

Oil and its formations – pipelines, wells, drills, equipment, refineries, noise, lights, money, work rhythms– are so ubiquitous that they pass unnoticed. The pipeline along the road, rusted, covered with matted weeds, is part of the landscape. It is something people drive by, walk over, and repurpose every day, to secure their cow as it munches grass, to use the heat radiating from it to dry laundry. The roads are full of industrial traffic: trucks carrying oversized loads of pipeline, separation tanks, company pickups. The metal signs that mark the entrance to roads leading to wells, the rumble of a gas flare behind a home – all are part of the place.

Today, Sucumbíos is a site of state and non-profit intervention in response to violence, food insecurity, domestic violence, drugs and arms trafficking, and a growing refugee population.<sup>11</sup> Many of the people who I came to know while living in Lago Agrio worked for

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<sup>11</sup> Life in northeastern Ecuador and southern Colombia has been shaped by conflict: the rubber boom at the turn of the twentieth century, oil beginning in the 1960s, and coca cultivation. In the early 2000s, the Putumayo department, just over the border with Sucumbíos, had become the center for the Colombian cocaine trade. The principal victims of the war on drugs were campesino coca farmers. Fumigations lead to widespread ecological destruction (Sánchez-Garzoli 2008), a technique that some experts argue was meant to displace people (L. Gill 2004, 186); it also led to social fragmentation, violence and insecurity, exclusion, and the public display of tortured bodies. One result was the forced movement of tens of thousands of Colombian displaced persons and refugees south across the border into Ecuador. The implementation of Plan Colombia in 2000 resulted in the first major displacement of Colombian refugees to Ecuador, many of whom now live in Sucumbíos province. The numbers of refugees entering the country are tightly linked to the Colombian internal conflict and war on drugs with an estimated 95% of refugees presently in Ecuador arrived between the years 2000-2007 as a direct result of drug violence in Colombia. Sucumbíos, along with the coastal border province of Esmeraldas, has the highest rates of homicide in Ecuador (Espín 2009). In relation to the Colombian conflict, the population of Lago Agrio has lived through periods of intense violence. Once while walking home at night with friends who grew up in Lago Agrio, they began to describe a topography previously invisible to me. Pointing to buildings that carried debts from drug money, they told stories of neighbors who came into money too fast; a sure sign of illicit

non-profit aid organizations, the majority of them were university educated Ecuadorians originally from Quito, Guayaquil, or Cuenca, or foreigners from European countries such as Italy, Switzerland, and Germany. While the birth of the city and the advent of commercial oil production in Ecuador were tightly linked, today the relations of the city are far more complicated.

### ***Chapter Overview***

Most commonplace understandings of harm resulting from oil operations in the Amazon follow a fact-versus-bias narrative that obscures the complexity of how oil has become a way of life in the Amazon. Ethnography is well suited to eliciting the density of harm, for telling a story that doesn't rely on a single set of facts or a single truth but rather examines how those facts are made. Doing so can encompass a multiplicity of harms. It allows one to trace how various actors delimit where harm begins and ends, what it consists of, and how different kinds of harm may or may not align.

I begin Chapter 1, *Memoir of an oil well*, in the 1960s, in order to follow the interwoven processes of settlement and oil development from the drilling of the Aguarico 4 well to the present. Through conversations with farmers, oil workers, and indigenous residents, I recount the making of today's northeastern Amazon ("*El Oriente*") through the drilling of the Aguarico 4 and the parallel arrival of settlers and their stories about building lives in tandem with the

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activity. In some cases, the neighbor was subsequently killed and the building remained unfinished, carrying the debt of the previous owner as part of its price. Growing up in the early 2000s, as children they were accustomed to seeing hired hit men, who arrived on "agile," imported motorbikes, stopped at the curb and pulled out a semiautomatic weapon. The Via Colombia, the principal road north to the border some 15 miles away, remains infamous for the dumping of bodies. By common lore, dozens of bodies appeared each morning along the road leading from the San Miguel bridge during particularly violent years in the 2000s.

establishment of the oil industry. These accounts contextualize the *Aguinda* lawsuit as well as continuing tensions over oil extraction. I came to know the Aguarico 4 well through my fieldwork, returning to it repeatedly on Toxic Tours with both local activists and Chevron representatives, for the inauguration of a presidential campaign to condemn Chevron, and to conduct interviews with residents who live nearby. I use this well as a compass to guide this story from opening to close, and as a specific site from which to illustrate the entanglements within which harm emerges in the Amazon.

The stories told by settlers reveal how the oil industry and farms, schools, and lives grew together in the region, routinely taking over large sections of indigenous territory. As extraction accelerated, waste pits overflowed into rivers and leftover crude was routinely lit on fire as an operating procedure to manage waste. In Chapter 2, *Desnuda frente a la contaminación: Toxic Exposure in the Amazon*, I address the toxic relations that ensued. I examine epidemiological and toxicological techniques for tracking the effects of chemicals on both human bodies and the environment. I argue that toxicity is not a bounded moment but rather a process that unfolds in the interstices of the history of this place. Like the hundreds of pits of toxic waste hidden in the Amazon, the problem of determining exposures calls us to consider the limits of techniques that make harm legible.

The *Aguinda* lawsuit was expected to provide a definitive answer to whether or not Texaco operations had caused harm to the surrounding environment and the people who lived there. Was the company responsible for contaminating the Amazon? As with problems in determining toxic exposures, the facts of contamination do not, however, speak for themselves. In Chapter 3, *Evidence/Evident in the Aguinda v. Texaco Lawsuit*, I take up the matter of legal evidence of harm in *Aguinda* through the example of the representative sample in the Judicial

Inspections. I explore how the sample-as-fact was made, how representation of the presence of contamination was achieved, and how the Judge drew these distinct objects together in his decision.

One of the major differences between the way the oil industry operated initially and the way it operates in now is the state regulatory apparatus that emerged in the late 1990s and early 2000s to manage the impact of fossil fuels on the environment. Technologies of quantification, however, predispose the representation of reality toward certain kinds of knowledge. In Chapter 4, *Bounded Impacts, Boundless Promise*, I take up one of these technologies and its product, the Environmental Impact Assessment. I show here how the material, historical, social, and aesthetic aspects of places in the Amazon are rendered visible in calculable forms in order to predict, contain, and prevent negative effects from the continued production of oil. I raise concerns about how Impacts – as a calculated form of potential harm – in an EIA travel beyond the document to inform discourse over the national benefits of oil, thereby justifying the continuation of extractive development based on the presumption of future benefit.

Due to Ecuadorian law, there were no witnesses brought to testify to the courtroom in the *Aguinda* case. Regardless, the act of bearing witness continually emerged in my fieldwork. Claiming suffering from oil operations through informal or public testimonies is a principal way through which residents demonstrate harm. Moving beyond legal evidence, in Chapter 5, *To Bear Witness: Bodily burdens in Toxic Tours*, I place several variations on the Toxic Tour of the Amazon in relation to explore what differently positioned practices of witnessing tell us about the politics of contamination and denunciation. I argue that while toxic tours make harm visible, they can also have the effect of naturalizing particular forms of harm depending on the relationship of witnesses to contamination.

In the final chapter, I return to the Aguarico 4 well, five decades after it was drilled. It was at this site that Ecuadorian President Rafael Correa began his *La Mano Sucia de Chevron* (The Dirty Hand of Chevron) campaign in 2013, which condemned Texaco's legacy in Ecuador. I juxtapose this campaign to Correa's decision, only one month prior, to end the Yasuní-ITT initiative, a novel environmental proposal to keep oil in the ground in the Amazon in exchange for international monetary support. Through the *Mano Sucia* campaign, Correa sought to mask Ecuador's expanding extraction in the Amazon through the reiteration of the contamination associated with the *Aguinda* case. By placing the campaign and the Yasuní-ITT in explicit relation, in Chapter 6, *The 'Dirty hand' of oil: Extraction and the future in Ecuadorian environmental politics* I draw together various themes about the making of harm that have emerged throughout the text: the mobilization of bodies to make harm evident, the use of calculative rationalities to justify extraction, the complicity of each of us in the production of oil – a substance that both sustains and endangers each of our lives.

While this text is framed by the question '*what is harm?*' I do not aim to settle this matter. Rather, I take the controversies surrounding oil in Ecuador as an opportunity to think about how we apprehend harm through various techniques, numbers, facts, images, and gestures which make it real. Such interventions have implications for decisions about whether or not to exploit oil, what safety measures to employ, how clean water needs to be for human health, or what value places like the Amazon have for different publics. Harm requires attention to time, process, and relations in a particular place in order to account for the contaminants that leach into soils over decades, disperse into the water and air, accumulate in the fibers of plants, and the fatty tissue of fish. While this ethnography is calibrated to the specifics of the Ecuadorian



Amazon, my hope is that the questions I raise may speak to debates around extraction and life in places far beyond.

## **AN INTRODUCTION TO OIL OPERATIONS**

Oil extraction begins with the construction of a well. The depth of the well depends on the regional geology. Petroleum, derived from the latin *petra* (rock) and *oleum* (oil), comes from decaying biomass, often from prehistoric oceans. It is comprised of hydrocarbons and other organic compounds, which have been trapped between sedimentary rock and subject to immense heat and pressure over millions of years.

Petroleum is refined after separating crude oil, gas, and water that exist as a slurry in underground pockets. The three components must be separated and refined in order to be turned into diesel, gas, jet fuel, asphalt, and thousands of other derivative products, such as plastics, pharmaceuticals, and medical supplies.

The water that is part of the underground solution is referred to as “production waters” or “formation waters.” Depending on the geological formation, there are different ratios of produced water to oil and gas in the slurry. On average, every one barrel of crude yields 10 barrels of production waters (US EPA 2001). According to Kimerling (1991) when PetroEcuador assumed Texaco operations in 1990, more than 3.2 million gallons of produced waters were being generated each day. Such water, like oil and gas, varies by location but is characterized by high salinity, the presence of hydrocarbons, and naturally occurring radioactive material. It also contains high levels of benzene, chromium-6, and mercury. Difficult to manage since they rapidly corrode pipelines and storage tanks, production waters are highly toxic to humans, animals, and plants.

Disposing of produced water poses a problem for companies and the environment. Generally too corrosive to transport via pipeline, produced water was previously disposed of through evaporation ponds or direct discharge into the environment. Today, such methods are considered unacceptable given their demonstrated negative environmental effects. In contemporary operations in Ecuador, produced water is generally injected deep underground via oil wells that have been converted into “reinjection” wells. However, environmentalists have raised concerns about the potentially harmful effects they may have, such as contaminating freshwater aquifers.

During the years of the Texaco-CEPE consortium, upon opening a new well and platform, approximately 3 waste pits were constructed. Waste pits were generally 60 by 40 by 2.4 meters in size, dug out of the soil like a large swimming pool. Pits were multi-purpose, used initially to measure the productivity of the well by pumping the contents into the pits over the course of 24 or 48-hour “production tests” after striking oil. Pits were also used to house the drilling muds in the making of the well, as well as other byproduct. Other pits were built to hold water that was used during operations. Over the course of a well’s life time, pits were closed when full and new pits were opened, resulting in some cases of 6-7 pits surrounding each well.



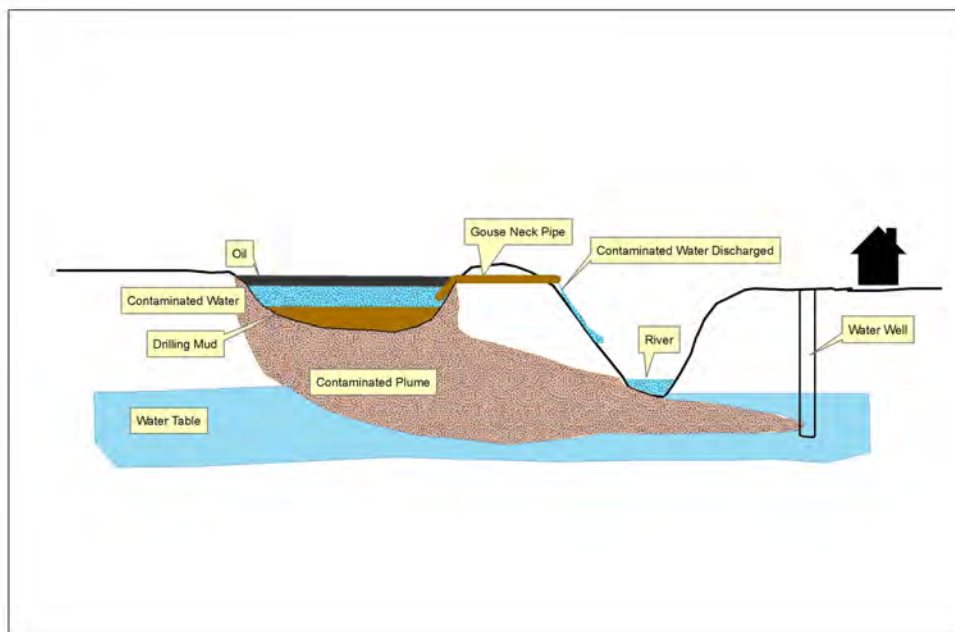
*Figure 1 An aerial image illustrating the relation of the waste pits to the well head. The lighter rectangular area around the well head is the well platform. Aerial images were used during the Aguinda lawsuit to locate pits that had been covered over during operations.*



*Figure 2 Well Platform and pits. To the right the platform is visible, with the access road leading off the right hand corner. The well is located in the center of the platform. One waste pit is visible to the left of the platform as well as a smaller pit off the upper right-hand corner of the platform. Source: Manuel Pallares.*

During Texaco operations, pits were not lined with any kind of impermeable membrane. Activists maintain that the pits were often positioned such that overflow from the pits would run downhill into a nearby stream or estuary. The company also discharged production waters into surrounding waterways.

Chevron representatives maintain that because of the high clay content of Amazonian soils, liners were not needed; the pits were effectively sealed due to the low filtration rates of the soil such that the density of the clay prevented water from seeping through. However, plaintiffs representatives argue that the waste materials leached through muds lining the pit and contaminated the water table below.



*Figure 3 A diagram of a generic waste pit in relation to surrounding water systems and a potential water well. Source: Manuel Pallares.*





*Figure 4 An open waste pit in the Amazon. Photo Credit: Mitch Anderson.*

As operations proceeded, many residents began to complain about the numerous open waste pits in the Amazon. At some point beginning in the mid 1990s, oil companies began to cover pits over with dirt, often without any remediation of the contents. Settlers arriving to the region subsequently built homes on top of pits, either knowingly or unknowingly. Some activists I spoke with argued that the covered pits have complicated remediation efforts because although the toxic contents are not visible, they remain in the environment.





*Figure 5 and Figure 6 Photos illustrating the proximity of settler homes to operations. Photos by author.*



*Figure 7 A wellhead of a reinjection well. Reinjection wells are painted green, live wells are painted red. Livestock are often attracted to the salty water that accumulates in the containing box [cubeto] around the well head. Source: Manuel Pallares.*

Production stations are built in oil producing areas in order to separate the crude oil from gas and produced water, prior to shipping the components to a refinery. In the case of the Amazon, several production stations were built, with central ones located in Lago Agrio and Shushufindi. These are part of compounds which also include administrative offices as well as worker housing, cafeterias, and recreation areas.

The gas produced as a byproduct of oil drilling can be processed and sold commercially. However Ecuador has not built the necessary infrastructure to do so. As a result, the combustible vapors are burned in towers called ‘gas flares’ or ‘flare stacks’ (*mecheros* in Spanish). This generally occurs near production stations or at some wells. Under the consortium, gas was routinely burned over waste pits through a series of lower pipes.

When gas flares are not operating properly, they emit methane and volatile organic compounds such as sulfur dioxide, which have been associated with asthma and respiratory



problems. Aromatic hydrocarbons such as benzene, toluene, zylene, and benzpyrene, which have been shown to be carcinogenic, are also emitted.



*Figure 8 A gas flare at the edge of a waste pit is visible in the Amazon.  
Source: Manuel Pallares.*



*Figure 9 A series of lower flares near waste pits (also called holding ponds) in the Amazon.  
Source: Manuel Pallares.*



*Figure 10 A flare tower in the Amazon visible on the ground surrounding the flare is an area covered in crude oil particles that have coated the surrounding vegetation. Photo by author, 2013.*

Pipelines are used to transport oil from wells to production stations and to refineries. Oil pipelines are generally made of steel or plastic, ranging in diameter from smaller ones of 4 inches to larger pipelines of up to 4 feet. Pipelines can be buried underground, or supported by steel bars above ground. In the Amazon, smaller pipelines run along access roads away from the wells and join other pipelines alongside the larger roads until reaching a station. The much larger SOTE pipeline transverses the Andes and brings oil to refineries in Esmeraldas.

One highly disputed technology used in the Texaco-CEPE consortium operations is the “goose neck” tube (*cuello de ganso*) that was part of the operational design of pits. The tube was inserted into one side of a pit to prevent its contents from overflowing the banks when it rained. The tube’s opening inside the pit rested just above the level of oil, so that when it rained – as it often does in the Amazon –rainwater would theoretically be pushed through the tube to drain out the pipe on the other side, leaving the crude inside the pit.



*Figure 11 The outer end of a gooseneck tube. Source: Manuel Pallares.*

Chevron representatives maintain that their use of the *cuello de ganso* tube not only was standard procedure at the time, but also that it permitted only water (and not oil) to drain from the pit. Plaintiff representatives assert, to the contrary, that the water draining out was mixed with toxic compounds as a result of contact with the oil in the pits. Steven Donziger, the plaintiffs' former lawyer, has argued that such components of operational systems were designed to pollute (Donziger 2010).

Total Petroleum Hydrocarbons, or TPH, refers to the mixture of hydrocarbons that are found in crude oil. There are hundreds of hydrocarbons that can comprise crude oil however each crude is geologically specific to the site in which it was formed. Chemicals of particular concern that occur in TPH include hexane, benzene, toluene, xylenes, naphthalene, and fluorene. Both the plaintiff and defendant lawyers contested the laboratory methods used to measure TPH in a

sample because certain methods are better at detecting higher levels of TPH, while other methods are better at detecting lower concentrations of TPH.

Several other chemical compounds are of concern to human health as well as in relation to oil production. Polycyclic Aromatic Hydrocarbons, or PAHs, are organic compounds that contain only carbon and hydrogen that are found in fossil fuels. PAHs have been shown to be carcinogenic and mutagenic. BTEX refers to the group of benzene, toluene, ethylbenzene and xylenes that are Volatile Organic Compounds (VOCs) that are found in petroleum products and have harmful effects on the central nervous system.

## MEMOIR OF AN OIL WELL: SETTLEMENT AND INDUSTRY ALONG THE AGUARICO

### *A spot on the Aguarico*

1960: The Aguarico River. *Agua*, water, that is *rico* – rich, fertile, delicious, exquisite, alive. Running eastward, the Aguarico river snakes down from the Andean highlands. High and fast near La Bonita on the Colombian border, the river opens across the lowland plain of the Amazon through the Sucumbíos province before joining the Napo River at the present-day Peruvian border. A stretch of 240 miles, here at its midpoint the Aguarico is wide and brown, with broad sandy banks.

South and inland from the banks of the Aguarico, some 30 kilometers downstream from what just a few years later would become the oil city of Lago Agrio, was a wide, flat swamp. Most of the year black, stagnant waters, from the rains that came each January, February, and March, filled the swamp. Warm and sticky, the still water sat protecting the *moretales*, one of the few palm species that thrive while submerged. Clumps of *morete* grew, their spikey green tops rising straight out of the water. Hanging above was the sweet, scaly fruit of the morete – deep red on the outside, pungent orange beneath – prized by monkeys, macaws, and people alike.

The monkeys and macaws weren't alone in this swampy paradise. Anacondas lurked in the *morete* roots while squirrel monkeys clamored overhead. The place trilled with insects, crawling, cutting, eating, pollinating. White-lipped peccaries rooted below, competing with tapirs for treats hidden in the warm mud. The vegetation was dense, heavy, overwhelming. Located within the overlapping territories of the Cofán and Secoya indigenous groups, this was a



good spot to find food. People called it a *pantano de casaría*, a hunting swamp. It was verdant, wet, and alive. The swamp spread through the lowlands over several kilometers inland from the river's banks. Then the land rose up a steep, 50-meter embankment, creating a small hilltop above. Here raptors rode the air vents, on the ready for a stray movement below.



*Figure 12 Morete palm swamp, photo by Mitch Anderson 2012.*



*Figure 13 Along the banks of the Aguarico today, photo by Mitch Anderson 2012.*

Despite fantasies of wilderness, the Amazon has long been a cultivated place, built by world-making practices far before the advent of oil. The Amazon has a rich, naturalcultural, material and semiotic history (Hecht and Cockburn 2010; Hecht 2013; Raffles 2002; Ogden 2011). Concerns about oil are often framed through comparisons with what the Amazon was like before drilling began. While the Amazon has never been an ahistorical natural frontier, the interconnected processes of oil extraction and settlement nonetheless changed the region in an unprecedented manner over the course of 50 years. The northeastern corner of the Amazon is an intersection of human and nonhuman worlds, built through assemblages and alliances that continue to shift as oil operations and life proceed.

My research took me throughout Sucumbíos and Orellana, the two provinces that marked the aperture of Ecuador's commercial oil industry. This chapter addresses several matters in



relation to this history. First, I show how the interconnected processes of agricultural settlement and oil development transformed forests and murky swamps into a site of major industrial production, a place that has featured prominently in environmental and political struggles in international media. That settlement and oil development forged this place in conjunction, seemingly uncontroversial, has important political and legal consequences. Debates over the consequences of oil production, whether focused on deforestation, road construction, pollution, the loss of indigenous lands, or health problems hinge on questions of causality, boundaries, and responsibility. These are tangled matters that resist efforts to parse strict domains of nature, settlement, and industry. Addressing some of the processes through which this place emerged, I argue that what shapes contemporary controversies over oil and the environment in the Amazon are entangled, even disorganized, practices, of which harm is a product (Ogden 2011).

I draw on the voices of settlers, oil workers, and indigenous residents alongside written accounts to track the making of this region, known as “*El Oriente*,” since the 1960s. People’s narratives offer a sense of the encounters that shaped the first three decades of a largely unregulated industry, while also providing background to understand both the *Aguinda* lawsuit and contemporary tensions around the oil industry. I present mainly on first-hand accounts that offer a sense of what life has been like in this place: the sickness or death of a child, a farmer’s attention to his fruit trees and outrage over the loss of farm animals after they drank polluted water yet again. People offered such accounts to me largely in response to my questions about their lives however I also draw on informal conversations and observations with interlocutors while touring their farms, attending community meetings, and participant-observation in workshops led by local NGOs. These stories are not about how life “really was.” They should be read through the lenses of time, nostalgia, and politics. At the same time, they illuminate in a

way that no other sources do the emerging relations between arriving mestizo *colonos* [colonists], forests, indigenous inhabitants of the region, oil company workers, machinery, and political and economic interests – all of which played a role in the making of *El Oriente*.

Both the *Aguinda* lawsuit and controversies about the oil industry newly interrogate actions in the past – such as why and how inhabitants were exposed to industrial operations. Accounts such as these by individuals who were witness to or worked in the industry, are disputed. The speakers I quote in this chapter are aware that their stories figure within a contested field of petroleum politics. Their insistence that *this is how things were* despite their knowledge of others who might contest them is clear. A Cofán man, concluding his tale about the pollution he watched drift down the Aguarico in the 1960s, told me:

That's why I always say that if this had happened in the present day we would have had cameras, then we would have had everything archived. But in this time, we didn't even know, nor did we have cameras or photographs or anything like that. We have seen the different effects of what oil did, but we only have it recorded in our heads. We don't have evidence that it was like this.

*No tenemos evidencia que era así.* Much of what the oil industry did along the Aguarico and throughout the region escaped public documentation. The speaker retrospectively wishes that these early years had been captured in order to demonstrate today what happened then. In response to an industry and political economy that privileges forms of expert knowledge over personal experience, I aim to convey what individuals alive during this historical conjuncture felt was important for me, as an outsider working on this project, to know in order to tell this story.

I begin this chapter by imagining what it would have been like to open a new oil platform in the middle of Amazonian jungle. I base my vignette on conversations with retired engineers who formerly worked for Texaco and other companies during this period. I focus on one well, the Aguarico 4, a site which will make further appearances in this text. The Aguarico 4 well is

located about thirty minutes outside of Lago Agrio along the Aguarico River. Accounts from individuals who worked in and observed the industry in its early years are remarkably consistent. This suggests that operating procedures for drilling wells and performing maintenance were standardized during the first two or three decades of oil operations in Ecuador, something confirmed in the proceedings of the *Aguinda* lawsuit (Zambrano Lozada 2011). I have constructed my description of the site from these first-hand accounts as well as from historical documents. I draw on the testimony of a Cofán leader who witnessed Texaco's arrival as a small child in order to suggest how those already living in the area saw this flurry of activity. His story points to some of the ways that indigenous people found themselves exposed to industrial chemicals at that time.

Following this description of oil development, I use interviews with early colonists to Lago Agrio and the surrounding area to show how oil and agricultural colonization proliferated alongside one another. Two groups of settlers formed the first colonists to Lago Agrio. Most were from the province of Loja, although many had already left Loja to farm in Manabí prior setting out for the *Oriente*. I place different voices in conversation with one another to give a sense of how accounts overlap and differ. Many of those I quote knew one another, although I interviewed them separately. I have edited the accounts for clarity and length, while trying to retain the sensibilities of narration. People talked about what it was like to make a life in this region. They often refer to religion, the importance of livestock and farmland, struggle and just occupation, and of their total ignorance of the oil industry upon their arrival.

Others surely would contest portions of these stories. Given my focus on the *campesino* settlement of Lago Agrio and my decision to live in Lago Agrio during fieldwork, this chapter adds weight to the perspective of peasant farmers. It does not do justice to the experiences of the

indigenous people who were living here when both Texaco and the farmers arrived. Other accounts by Cepek (2008; 2012b; 2012a) on the Cofán; Rival (2002), Cabodevilla (1994; 1996), Yost (Davis and Yost 1983), and Kimerling (1990; 1995; 1996; 2006a; 2006b) on the Waorani; Whitten (1985; 1976; Whitten and Whitten 2007), Muratorio (1991; 1998; 2008), Uzendoski (2004; 2005) on the Kichwa further south in Napo and Pastaza provinces; and Vickers (Hames and Vickers 1983) provide accounts of the lives, struggles, and survival of indigenous groups in the face of expropriation of land, forced labor, relocation, civilization projects, and political organizing over the last century. This chapter should be read with these absences in mind.

#### ***Texaco arrives: AG4***

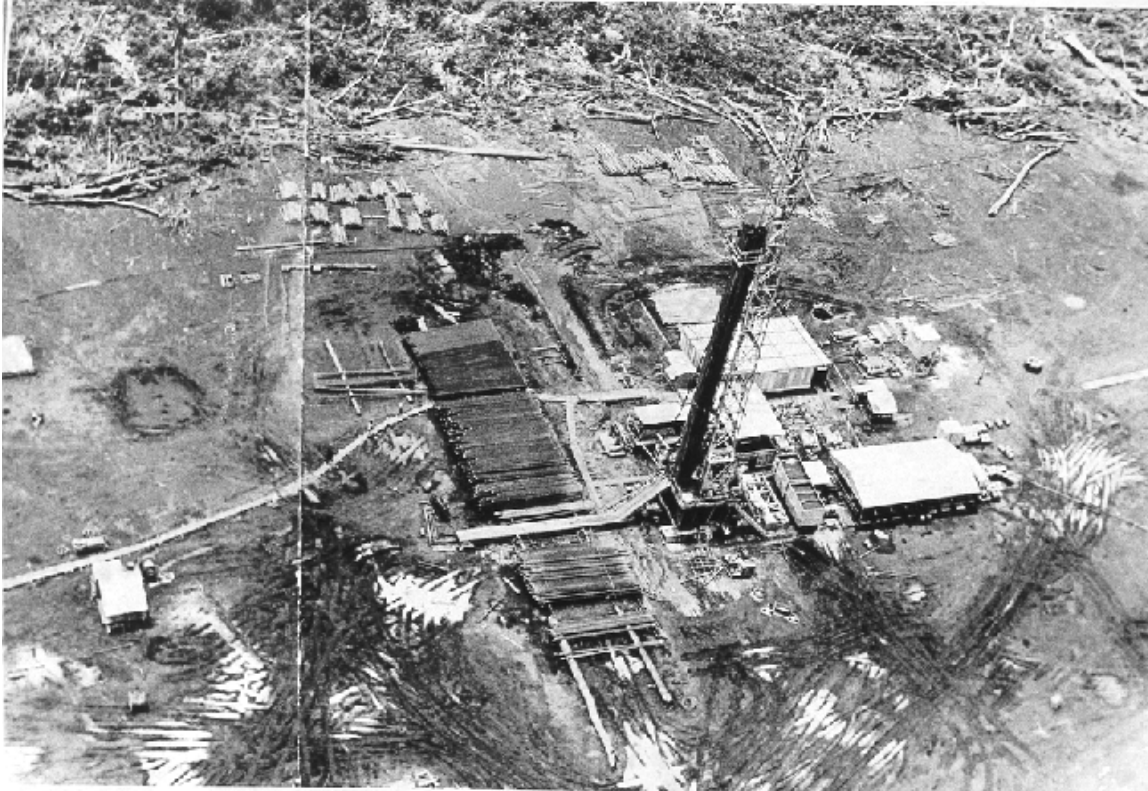
Spring of 1974, Santa Cecilia. Texaco has been in the Amazon for a decade. With the completion of the pipeline to Esmeraldas in 1972, Ecuador became an oil-producing country. Santa Cecilia was a frenzy of oil company employees and military men. A community of just over 100 people, mostly Kichwa and Cofán families, the arrival of Texaco turned Santa Cecilia into a hotbed of oil activity. A length of 1,500 meters had been cleared through the jungle to put down a landing strip next to the Santa Cecilia military base. At the time, this was the third busiest airport in the nation, with 110 flights coming in and out weekly, arriving from the Shell airport in Puyo and the capital in Quito (Gallego Coto n.d.). Large Ecuadorian military planes arrived, hauling oversized oil equipment, food, and settlers, lending a hand to those who had ventured from the highlands and the coast in search of land.

A helicopter took off from Santa Cecilia. Using the analysis of exploratory studies conducted in the 1920s by the Leonard Exploration Company, again in the 1940s by Shell, and repeated by Texaco in the 1960s (Petroecuador 2009), it seemed likely that there was an area of

oil trapped deep underground just southwest of the Aguarico River. After striking oil in 1964 with the exploratory Lago Agrio-1 well, some ten years later Texaco was continuing to expand operations. The helicopter hovered over the treetops at the selected point of perforation. Careening down on ropes, workers were swallowed up by the dense canopy. They landed with machetes and axes in hand, as the drone of the helicopter faded. Over the next few weeks, work proceeded day and night. Trees were felled, brush was cleared and a space for a heliport emerged. The top of a hillside was leveled, a square of red clay amid a forest of green. Workers set out to find the closest water sources, hiking down the hillside through the *morete* swamp to reach the banks of the Aguarico River.

The work clearing the land continued over the next few months. As helicopters brought more equipment, a platform for a well was cleared. Once it was clean and ready, helicopters dropped off the perforation tower that mechanics would then assemble over the point previously selected via seismic assessments as optimal for the well. Off to the side of the clearing campers were set up. The site was built around spatial distinctions. The best campers were reserved for the *gringos*, with slightly less comfortable campers for Ecuadorian professionals, one for the manual laborers, and – in the words of one oil engineer – small plastic tents for the most miserable of all – “*carpitas de plástico para los mas infelices de la tierra*” – those who did the dirtiest, hardest work. All told, the Aguarico 4 well would have had between 20 and 40 workers living on site during preparation and drilling. Engineers and professionals were most often foreign, with Ecuadorians doing the physical labor – cutting down forest, clearing brush, carrying heavy equipment. In the meanwhile, this spot on the Aguarico quickly became cosmopolitan, with workers arriving from the US, Mexico, Argentina, and Colombia.

Helicopters landed several times a day – so many that some said there were more helicopters buzzing through this area than there were in the Vietnam War.



*Figure 14 A Texaco well in the Amazon in 1967, Source: El Comercio.*

The oil workers were not alone. The area surrounding Lago Agrio along the Aguarico River had long been Cofán territory, bordered further south by the Siona and Sekoya. For anyone who has spent time in the Amazon, a healthy forest is anything but quiet: the shrieks of monkeys, the clicking and humming of insects, the refrain of birds keep the ears alive. But the helicopters, drills, and chainsaws brought a drone of noise that was extraordinary. Describing a trip by several families up river to visit the site of the Lago Agrio 1 well, the very first exploratory well drilled, Ramón described to me what it was like as a young boy only 6 years old. Part of a Cofán family that spoke A'ingae, he lived just downstream from what would become Lago Agrio on the Aguarico River. They had never seen helicopters – *metal birds*, as he described them – or

heard such incessant noises. The Aguarico was the primary source of water for drinking, cooking, and bathing, as well as for transport. He recounted this moment to me as we sat upstairs in a building that is now located on the busy main street in Lago Agrio. He began our conversation by noting that— from four stories up, we were seated at the same height as the former forest canopy that covered this place in his youth. Ramón knows that the events that he describes are now the subject of a controversial lawsuit.

I was born in the community of Cofán Dureno. In 1964, the Texaco Company arrived here in the Amazon. I was 6 years old and with my family we traveled upstream to Lago Agrio on the Aguarico, where we lived with 5 other families. At this time, the first well that they were going to drill was Lago Agrio 1. And so from there . . . we didn't know what they were, but we had seen helicopters, and we hid in the jungle because we didn't know what they were. And then a few months later, two months or so, we saw an oil spill on the Orienco River. [The Orienco] runs into the Aguarico, and we lived right in the sector where the oil spill was passing through. The oil spill was thick and broad, and ran directly from the well to the river. This contaminated the water, but during this time we didn't speak Spanish so we had no way to complain. When we went to get water we would clear away the oil that was sitting on top of the water. During this period we didn't have the custom of boiling water. So we got it directly from the river and drank it.

The oil wasn't mixed in the water, but rather it was sitting on top of the water. And we didn't know that it was going to stain everything, so we walked on [the oil that washed up on the banks of the river] and it stained our feet. Anything that it touched it stained . . . We would try to wash it off with water but it doesn't come off. We'd try with sand [scratches arm vigorously to demonstrate] and still nothing. And that's how we lived. It stained the canoes, the paddles, everything was slippery. So that's when, my dad and my brothers said, 'Let's go see where this black stuff is coming from.' We didn't know. We went up to the Lago Agrio 1 well, and that's where the first Americans that had arrived here were. We saw them, and we approached the camp where the company was working. From there they let us into the kitchen, and there was food. We ate there, but we didn't know what it was [that we were eating]. It was like sardines with spaghetti, not very good. We tried to eat but didn't eat very much. And then when we wanted to leave, they said, 'Take these things with you.'

Footage of these early Texaco operations shot by Scott Robinson and Michael Scott in the film *Sky Chief* (1968) lets us glimpse the fervor that Ramón and his family would have encountered as they came out of the forest to the space Texaco had cleared near Lago Agrio 1.

Over an expanse larger than several football fields, a plane lands on a dusty runway. Against a backdrop of low trees, a flurry of activity: workers discharging immense sections of pipeline from the belly of the plane; the clash of metal as a tractor dumps the pipelines onto a waiting flat bed truck; the whirl of a helicopter swooping in to drop off a bundle of empty oil barrels.

And so my dad took *panela* [raw cane sugar], they also gave us cheese and diesel fuel. So we carried it into the jungle, where we stopped to look and see what it was. What is this? We opened the *panela*, and it was sweet. So we said, 'Well, it seems that you eat this.' We opened the cheese, but the cheese in these times – it smelled bad and they had given us a ton of it, so we dumped that in the jungle. The diesel, well that smelled bad too, so we said, 'We're not going to eat this if we don't know what it is. We'd best take it with us to Dureno and the missionary there can tell us what it's for.' So we took it to Dureno, and the missionary told us that the *panela* was to make juices with, and the diesel, that is for lighting, like for a flare to see with at night.

In the film, a Cofán man notes with trepidation the changes he was witnessing, translated from A'ingae to English and Spanish by the film editors: "I am afraid of the white man and what they're doing. I've been over there [to see the wells], but I haven't seen it all. I've ridden on the airplane, it's fun..." The documentary cuts to a Cofán family in their camp, swinging from hammocks and cooking over a hot fire on the edge of the forest with the oil activity beyond. The speaker says that they have come to find out what is going on; they'll stay a bit longer to see all that is happening. Ramón continues the story of his family's encounter:

After that, we weren't able to stay [where we were living] because everything was stained and the oil spill never stopped. Day after day. And so the people said, 'Well, we'd best abandon this place.' So we abandoned it, and went to what today is the Cofán Dureno community. The company started first with well Lago Agrio 1, and from there went to Parawaku, and then to Atacapi, and then to Dureno 1. And you have to imagine, the Orienco River and the Aguarico were full of oil spills. The banks of the rivers had white rocks, and sticks that the women would collect for firewood. But now they were stained with oil and the food [that we cooked over the fire] had a different smell, the smoke changed the food and it smelled of oil too. So from then on the women stopped gathering wood on the beaches and went to look for branches in the forest. Because everything smelled awful. But the children would still go and swim in the river, drinking the water, and then afterwards they would get sick: stomach pain, spots on their skin, rashes.



These scenes of oil coating the rivers and running downstream are not difficult to imagine for anyone who has been to the Amazon and seen an oil spill filling a river or in the ditch under the pipeline along the road. In *Sky Chief*, some of these early spills are caught on camera: sticky black globules swirling into the water under the rumble of machinery; gray water running past slimy river rocks. As Ramón describes it here, families drank from the rivers directly, used the water for cooking, bathing, washing, and transport with no knowledge that it would be harmful to their health. There was no barrier between what oil operations discharged into the river and what people took into their bodies.

The women would drink the water and then afterwards they would have miscarriages. The women were all surprised because before this had never happened to Cofán women. But after the [initial spills], then two, three, four years later the women started having miscarriages and babies with malformations. Sometimes the women would give birth early and the babies would be poorly formed. We didn't know what was happening, or why this was happening. I had been through 12 years of school, so they took me to Limoncocha [to the Summer Institute of Linguistics missionary center] to study as a health promoter in order to prevent the diseases we were experiencing, because we were seeing different kinds of diseases. I studied for a year as a health promoter and was trained. And so I came back to the community with information – that we needed to boil the water [before drinking], that we needed to dig wells [for water] in order to prevent these diseases. And since then the people have been changing their lives, because prior to this we just collected water from the rivers.

By the time I was 16 years old, the Aguarico was completely contaminated. I was married, but my wife, she didn't listen to me when I said that we had to boil the water. When she was out by herself, she'd drink the water [from the rivers]. She was pregnant. And when she gave birth to the baby, the baby didn't develop the way it should. The baby was 6 months old, but really tiny. I took the baby to Limoncocha for treatment, and they weren't able to do anything there. They took the baby to the Hospital Vozandes in Quito, and it was there that my first child died. After that I had another child. That child was born fine because I had said, 'We have to prevent [sickness], we have to do things this way' and [my wife] took care of herself and didn't drink the water without boiling it. And the baby grew well for 3 years. He could walk, swim, and one day I took him to the river so that we could bathe. I thought that it was okay for him to bathe in the water, but while he was in the river he swallowed some water. By the time we got home he started to vomit. He vomited and vomited until finally he was vomiting blood, and died within 24 hours. He was 3 years old.

This region had long been the object of missionary intervention, beginning with the Jesuits in the 1600s. Capuchin priests, who had been expelled from Ecuador, took up residence in Colombia on the other side of the Amazonian border in 1896, where they enjoyed extensive authority over the Caquetá and Putumayo regions during the rubber era (Wasserstrom 2014:531). In 1914, concerned about the proposed political boundary between Ecuador and Colombia, Capuchin missionaries reorganized the Cofán into a settlement near the San Miguel River, where they undertook a “civilizing” project that included planting crops and attending schools; they also encouraged abandonment of traditional housing arrangements (Cepek 2012b:8). The Summer Institute of Linguistics/Wycliffe Bible Translators that Ramón refers to in Limoncocha were a later chapter in the history of missionary projects with the Cofán. Through a contract with the Ecuadorian government, the SIL built airstrips and a basecamp in Limoncocha and agreed to provide education, healthcare, and other services to indigenous communities (Wasserstrom 2014:539). Here Ramón describes some of the interactions that his community had with SIL missionaries, including turning to them for questions relating to oil industry, education, health care assistance, and health promotion programs.

So after that the people were saying, ‘What are we going to do?’ And some Cofán people from Colombia came to Ecuador and told us that these oil spills were a form of contamination. And another *compañero* who had studied and participated in the meetings of the CONFENIAE<sup>1</sup> also brought us information telling us that we shouldn’t drink this water, that we shouldn’t get the oil on us, that all of this was an oil spill. But where could we go to demand that they not dump the oil directly in the rivers?

We started to collect rainwater and dig wells for water, but the rain was also contaminated because of the smoke that came from the gas flares that were lit in those days. When it rained, it came down black. This was even worse, this was direct [exposure]. And so that’s how we lived. Not just my family, and not just the Cofán people, but also the Siona and Sekoya peoples, all of us suffered who lived in the

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<sup>1</sup> Confederation of Indigenous Nationalities of the Ecuadorian Amazon; the political organization of 9 indigenous nations in the Ecuadorian Amazon.

Amazon. And then people started studying to be able to learn Spanish and they would participate in meetings and we decided that we weren't going to accept the entrance of the company. But by this time 20 years had already passed.<sup>2</sup>

The contamination is always the same. The oil spills are the same. Because the waste pits they build that are 15 by 20 meters or so, when it rains, where does the oil go? Well it overflows and spills into the streams. And the streams, where do they go? Into the Aguarico River. Even today this happens. [But today] its not like it was here before. Before the lizards, capybaras, ducks, anything that lived in the river would be the color black [from oil]. Black lizards. Black capybaras. The ducks died because they wouldn't be able to fly. The oil would stick to them. And if you killed the animal, you'd find when you went to eat it that the flesh inside would be stained black from the oil.

The arrival of Texaco was completely outside the frame of reality for those living in the region.

Ramón describes the strangeness with which the company entered their lives, through funny smelling cheese, noises, bizarre flying contraptions, and oozing substances that mixed with the water they drank and swam in, and coated the rocks, the sticks used for firewood, the innards of animals. These encounters with oil provide an important point of contrast with what one might see traveling to the area today. Because the oil industry, (as noted above, extraction was not limited to Texaco but was conducted through the Consortium with the state company, CEPE, and thereafter other international companies such as Repsol YPF, and Andes Petroleum) operated without any comprehensive regulation for nearly three decades, those living in and around its operations were directly exposed to the chemicals involved in drilling and production: in the water they drank, bathed in, and cooked with; in the air they breathed, the roads on which they traveled, and the soil in which they grew food. Oil wrought changes in bodies of water, animals, humans, soil, and air. Ramón described a moment that preceded more recent efforts to account, track, or document the dispersal of toxins.

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<sup>2</sup> For more on Cofán political organization and resistance see *A Future for Amazonía* (Cepek 2012b)



*Figure 15 Texaco and Gulf workers at the first well drilled in Lago Agrio circa 1967-1972.  
Source: El Comercio.*

### ***Drilling a well***

This marked the beginning of oil operations in the Amazon. Following success at the first wells near Lago Agrio, Texaco expanded exploration southward into the forest. As camps were opened and oil began to flow, accompanying roads were built by the company and sometimes by the state. A road connecting Santa Cecilia to the camp in Lago Agrio was completed, and others branched out to new camps from Lago Agrio. The Aguarico 4 well is in a relatively small oilfield just north of the much larger Shushufindi field. 10 wells were ultimately drilled, along with one production station just up the hill from Aguarico 4. Like every well, Aguarico 4 was given an

abbreviation, carved into a signpost made from a section of pipe, painted yellow, and mounted at the end of the access road: AG-4.

Oil activity took place at great speed. It took less than a week for a drill tower to be assembled for a new well, a hulking four-cornered rig several hundred feet high powered by an immense motor. As the motor rumbled to life, the drill punctured the clay earth. The initiation of drilling, also called “spudding,” began at Aguarico 4 on 25 June 1974. Over the following months the drill rumbled downward to reach a pocket of decayed biomass sandwiched between layers of sand and rock. One day, when the drill reached below 9,500 feet, oil pounded out of the top of the well, shooting 30 or 40 meters into the air. The ground below was bathed black. Success!

Upon confirming that there was indeed oil trapped thousands of feet beneath the earth at this site, tests were run to determine the quantity of crude and the volume that this particular well would likely produce. Pits were dug off to the sides of the well platform. These were akin to large swimming pools dug into the ground. 3 pits were constructed at the Aguarico 4 well. As crude spilled out of the well, it was piped into the pits and left to run for 12, 24, sometimes 48 hours. These were “production tests” to judge the well’s promise. On 19 July 1974 (Chevron 2014)<sup>3</sup>, the Aguarico 4 well was officially finished. In a few months time, the place had been converted into an industrial zone, a space of ownership and regulation, linked indelibly to political promises of prosperity from as near as Santa Cecilia and Quito to as far as San Francisco. With the initiation of production in October 1975, the promise of black gold had once again been manifested.

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<sup>3</sup> Other sources cite 2 August 1974 as the completion date.

Once a well was confirmed as productive, Texaco needed a way to get the crude slurry off the hilltop overlooking the Aguarico and out to a separation station, where it could be pumped into different tanks and separated into its parts. With the urgency typical of the oil industry, a pipeline had to be built from the well to the station. Luis, an oil worker who had been one of the first Ecuadorian engineers to work for Texaco in this area, explained to me how the pipes were installed. Today, pipelines are such a defining feature of the landscape, running along nearly every road with sometimes several dozen joining together before being directed into a station, it is difficult to imagine the region without them.

So what happens? With the desperation of those that are in charge of the money, they don't want to just know that there is oil there. They want to sell it. They want the money. So in the beginning, without much planning the wells [are connected by pipeline] directly to the station, that's why you get that macaroni [of pipelines] alongside the roads. Produce, transport, sell. The most logical solution is to build a pipeline that unites one well with another so you don't have so much pipeline. But, this was the pattern, the form that the *señores* [of Texaco] left behind and afterwards the Ecuadorians said 'Ah, this is the logic of how things are done.' But it is not logical. Common sense is not the most common of the senses.

Building a pipeline was quick. Three, four, maybe eight days later, depending on the distance, and it was finished. With the zeal that comes with knowledge of oil waiting to be sold, nothing was to detain the crews, who worked day and night building pipeline. "If a tree hindered them, the tree went down," says Luis. "There was no such thing as obstacles. In the petroleum mentality you can't think of obstacles. Let's see – If we need a bridge built, the bridge must be built. 'Bring in the iron, bring in this or that,' and Boom! The next day you have a bridge." There was no time for thinking ahead, for debate or delay.

In the case of the Aguarico 4 well, the pipeline would have most likely been completed in less than two days. The well, situated in the center of the earthen platform, is connected by a pipeline that runs in a straight line to the perimeter of the platform, and then alongside the access

road to the Aguarico Station, about three kilometers from the well itself. Once the well was hooked up and running smoothly, things on site became more routine. Workers collected their tools. Campers and equipment were packed up and moved to the next well. The well began to quiet down, save for the constant rumble of the generator. The trash accumulated over the course of the five or six months that workers had been living on site was left in the forest or dumped into the waste pits.

One man would stay behind as the well's caretaker. He might work 22 days straight and then leave for 8 days rest in Lago Agrio, or travel back to Quito or wherever he was from. Some worked 30 days straight with 15 days off. These rotating shifts remain typical in the industry. Should something go wrong with the well, he was there to radio his superior at the station. Mostly, he spent his time "*viendo selva y pajaritos*" [looking at the jungle and birds], says Luis. Boredom abounded. Once a day, a production engineer would bump down the dirt road in his company pickup to check on the well. Like anything done frequently, checking the wells became second nature. Being an oil engineer was not unlike being a doctor, although the symptoms of good health were inverted: "You know the well. It is your patient, you have to check his pressure, temperature, production." With practice, one could tell by touching the pipeline coming out of the wellhead how the well was doing. If it was hot, the well was producing well. If it had cooled down, then one might wonder what was wrong – perhaps the well needed maintenance work or cleaning.

What remained at the Aguarico 4 site was the platform, the bright red wellhead that indicated the well was in production, and the lone caretaker. Three waste pits had been built. One contained crude oil from the production tests; a second contained a mixture of crude and muds from well maintenance; a third had been used to store water during drilling and contained a

relatively minor amount of residual oil. Various other waste items, chemicals, and unused materials had also been left in the pits. In the pit used for production tests a “*cuello de ganso*” [gooseneck] tube had been installed. Shaped like a stretched out ‘S,’ the tube was designed to prevent a pit’s contents from overflowing its banks when it rained. As water collected on top of the crude oil in the pit from the heavy rains common to the Amazon, the water would be pushed up through the tube and drain out the other side of the bank of the pit. In theory, it was designed to keep crude in the pit and allow the water to drain out. The gooseneck tube in the pit directly in front of the platform remained in place, slowly oxidizing, while runoff water from the pit drained down the bank of the hillside into the swamp below. A central point of contention in sites like Aguarico 4 is the continued draining of pit contents through such pipes.





*Figure 16 Donald Moncayo, a local activist for the Frente de Defensa de la Amazonía, stands on the overgrown Aguarico 4 waste pit during a Toxic Tour. Photo by author, 2013.*

1976. Two years after the Aguarico 4 well was drilled, the swamp below the platform began to fill with oil. Farmers living nearby recall that a thin gloss of oil sat on top of the still water, the overhanging leaves a hazy shadow against the light. When anyone – human or animal – stepped into the muddy stream, bubbles would rise to the surface breaking open into a slow, rainbow slick. Six years after the Aguarico 4 well was drilled, people recall that the *morete* palms began to die.

1984. Ten years of production. The engineers were disappointed. The well had let them down. No matter how much they coaxed the oil below, through “workovers” where the

production tubing would be removed and replaced in order to increase production, the oil wouldn't flow. So one day in September, the decision was made. After yielding 730,071 barrels of oil, 173,898 cubic feet of gas, and 73,775 barrels of water (Chevron 2014), the motor rumbled to a stop, the supervisor's tent was dismantled, and the valve on the wellhead cranked to a close. Relative quiet overcame the platform. Grasses crept in, and *la dormilona* plant [the sleepyhead] with its ferny leaves and shy flowers, retreating to a small ball if brushed by a passing animal or errant human, took over the eastern side of the platform. The Aguarico 4 well retreated into the background, its traces remaining in rusted pipelines and in papers stashed in Quito offices. The artificially flattened square of the platform and the three pits that surround it, a scab at the end of a bumpy dirt road in the jungle, began to mend.

Low growth took over the banks of the pits; leaves and other debris blew onto the surface of the oil in the pits, slowly decomposing into a fine dust. Seeds were blown. Vines from the canopy extended downwards, ever so slowly, to reach the surface of now dull, black crude. The oil lost its luster. New growth sprouted. Trees fell. Ever so slowly, the forest began to regenerate around the three pits. Rains came, and filled the pits, sitting on top of the heavy crude. Farmers continued to traverse the *segunda linea*, a path leading from the platform's corner into the forest where agricultural plots had been claimed. Machetes were swung to defend the path from new growth. Donkeys dragged out heavy loads of plantain, lumber, cacao. As their parents continued on ahead, children sneaked through the heavy brush to stand on the edge of the pit, poking branches through vegetation to pull up matted clumps of crude and decaying leaves. And down the hillside below, beneath the well platform, sat the swamp. The *sahíres*, *tapires*, and *pavos* no longer came as they used to. But the place, once again, was quiet.

### ***The arrival of the settlers***

As oil extraction began, thousands of settlers were pouring into Lago Agrio and the surrounding region from Ecuador's southern and highland regions. People followed the oil access roads in search of land to claim, staking out plots along the road and turning forest into farms. This has given a particular shape to life in the area. The towns and small cities that have grown up follow the contours of roads laid down to connect wells. People built houses next to wells, platforms, and stations, which often meant they had to cross pipelines to reach their front doors. In some cases, later settlers built houses on top of the waste pits that had been filled next to abandoned wells and covered over with dirt. When asked, people told me that they did not know there was a waste pit below but simply thought they had found a nice, flat space; others said that they did not realize that waste pits could affect their health.

In spite of fences, security, and physical as well as bureaucratic boundaries, distinctions between industrial and residential spaces are blurred. The proximity of settler and indigenous communities to unregulated industrial operations during the first decades of oil development exacerbated health and social problems. This has had important repercussions for disputes over harm. In legal and scientific forums, boundaries must be drawn to demarcate where industry ends and life begins. Such an exercise proves difficult in a place where life and oil, like dense jungle vines, have grown together.

It is April 2012. I turn now to the accounts of settlers who arrived around the same time as the opening of the Aguarico 4 and other wells throughout the region, many of whom live in the areas first drilled by Texaco. A small house sits on the corner between the road leading out of Lago Agrio and the access road to the well behind. A border of slender trees has been sown to create a fence around the house. An old Texaco barrel, sliced length-wise, forms a water trough

for the chickens, dogs, and other animals wandering about. Throughout this area you often find remnants of oil barrels, reincarnated as trashcans, cut in half to hold animal feed, or rusting in the forest alongside an abandoned well. The fading letters index companies no longer present. Gonzalo's property extends back from the road, through which the road to the well cuts. This land has been the site of disputes with oil companies for years, over spills and the waste pits on which the house of one of his children sits. Industry and settlement are integrated: houses, well platforms, gardens, toxic waste pits, and gooseneck pipes form the sedimented layers of history that have made the region.

The rain is picking up, thundering across the zinc roof, a curtain of water streaming over the open door. Slots of light fall through the wooden slats of the walls where the planks don't meet. A machete leans in the corner next to symmetrical bowls made from the calabash tree (*mate*, or *arbol de las calabazas*) filled with chicken feed, with laundry strung overhead. The sweet, fermented smell of drying cacao fills the house. Reporters and investigators have come in search of his testimony before; thus Gonzalo and his wife were not surprised by my request for an interview when I came by a few days prior with a neighbor. Gonzalo's wife arranges plastic chairs to face each other across the cleanly swept cement floor.

Gonzalo was one of the first colonists to come to build in Lago Agrio. Arriving in 1969-1970 from Loja, he chose a plot of land along one of Texaco's exploratory wells. For the following four decades he and his wife raised a family and worked the land. When Gonzalo first arrived, Texaco was stationed at Santa Cecilia. The company had begun explorations and was beginning to build the main camp and station that now stands at the eastern entrance to Lago Agrio.

Well, I come from the province of Loja. I came looking for land, because there wasn't anywhere I was from. In the period of President Velasco Ibarra, many came to colonize

the Oriente. These were vacant lands [*tierras baldías*]; they didn't have an owner. The only ones who were here were the *gringos* – Texaco was here. They had started to explore for oil, but they still weren't extracting oil. We arrived when the oil camp was just being finished...[Texaco] was just beginning to build the road from Santa Cecilia in order to move the things they had in [to Lago Agrio]. I came here with another *compañero* blindly, we arrived without knowing where we should look because no one could tell us anything. The *gringos* didn't understand us, and the *indígenas* even less so. They didn't say anything; they were like shadows – that's it. We would ask something, and they wouldn't say anything.

The principal routes to Lago Agrio in the early 1970s were via military cargo flights from Shell to Santa Cecilia, or by travelling through the southern Amazon from Shell to Puyo, Tena, and then up the Napo River. When the earliest settlers arrived in Santa Cecilia, they followed the Aguarico River downstream, or cut through the forest where the military and Texaco were building a road from the base to the oil camp. Many settlers struck east thinking that they would find opportunities to work in the industry. Although Gonzalo arrived earlier than this rush of workers, he references a policy which took many looking for work by surprise: in order to get a position working in the oil company or for a contracting company, one had to apply in Quito (Viteri Toro 2008). The oil industry was not interested in a wave of new arrivals in search of work.

Many settlers described their arrival in the Amazon as destiny, claiming they were led by God. For highland farmers, the jungle landscape was as unfamiliar as a new country; they were unaccustomed to Amazonian animals, the forest was dense and overwhelming, the heat was oppressive, they were haunted by stories about savage Indians and jaguars. Colonists told stories of arrival that centered on struggle and perseverance, marked by both fear and wonder at the new place that was to become home. Gonzalo and his partner continued through the afternoon, lost in the jungle. Late in the day they heard a motor in the distance. Disoriented, they thought perhaps

they had become turned around and mistakenly were heading back towards Santa Cecilia. The motor continued, until up ahead they saw a light like a mirror flashing through the jungle.

And then we saw that it was a river. We followed the river, and it turned out that there was the road that they were building between Lago Agrio and Santa Cecilia. There were tractors and equipment alongside the path – right where the *Colegio Napo* is now. And this motor that we heard, well they were getting to the point of finishing the road and the motor had broken and they were there pulling on it and pulling on it to try and get it to turn... The *gringo* saw us coming from far away along the path, saw that there were two of us. But since the path was full of mud and we were all wet and without shoes, when we were about 20 meters away he took out his pistol and pointed it at us, saying that we could be *Aucas*!<sup>4</sup> And so that's how we arrived. And he said – 'Where do you come from?' We said, 'We come from Santa Cecilia.' 'On foot?' He asked. And I said, 'We have come in search of Lago Agrio.' And the head guy, the *Mister*, he said – 'Wait here, I'm going to come back if we can get the motor to go so we can give you a ride.' And then he tried once more, and all of a sudden, the motor turned over. As though it had been waiting for us to arrive. A coincidence. And that's why I tell you – when you have faith in God, God will help you.

*Caramba!* Gonzalo claps loudly at the chickens poking at his feet and they scatter to the corners.

He tells how company workers brought him and his *compañero* to the Aguarico River where they found their fellow travellers who had preceded them in a canoe camped out on the banks.

The next day they set off through the jungle to find the center of what is now Lago Agrio.

Around the time that Gonzalo was trekking through the jungle, another group of settlers had also set off in search of Lago Agrio.<sup>5</sup> One of the leaders of this group was Jorge Añazco Castillo, a trader who had spent years travelling through the Amazon. Añazco was active in the

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<sup>4</sup> 'Auca' is a Kichwa word for outsider or enemy, used to designate someone who was not from your own group that has since been adopted into Spanish. Auca became an important category during the colonial period to mark inter-ethnic relations when 'wild' Indians (*aucas*) were contrasted to those Indians who were 'tame' (*mansos*) on the basis of their participation in Christian missions and evangelical processes (High 2009). In 20<sup>th</sup> century usage in Ecuadorian Spanish, *auca* has come to stand for the archetypal savage, the Waorani warrior, the last Amazonian indigenous group of the northeastern region to be contacted. When used in these accounts by mestizo colonists it is used to evoke the racialized savagery of Amazonian Indians whom they feared were dangerous.

<sup>5</sup> This is likely the same group of settlers that Gonzalo describes meeting on the Aguarico, although I was unable to confirm this.

founding of Lago Agrio and in subsequent efforts to establish Sucumbíos as an Amazonian province in 1989. He compiled his experiences in the Amazon in an autobiographical account entitled *Sucumbíos: The fifth Amazonian Province* (2008). I quote the prologue here to conjure the tone of providence that is frequently invoked in these origin stories of Lago Agrio:

Man goes in search of his destiny. His ideal is to work wherever. God has marked his fate, like he did with Moses in the beginning of the centuries. He will be responsible for bringing his people to the promised land. He is certain, full of faith and hope on the designated route. He passes along rough roads bordering frightening precipices, navigating along rivers that mark borders, until he reaches reaching the Amazon, that region of magical beauty, with ancient trees that shelter the traveller affectionately, to protect him from sun and rain. (Añazco Castillo 2008:3)

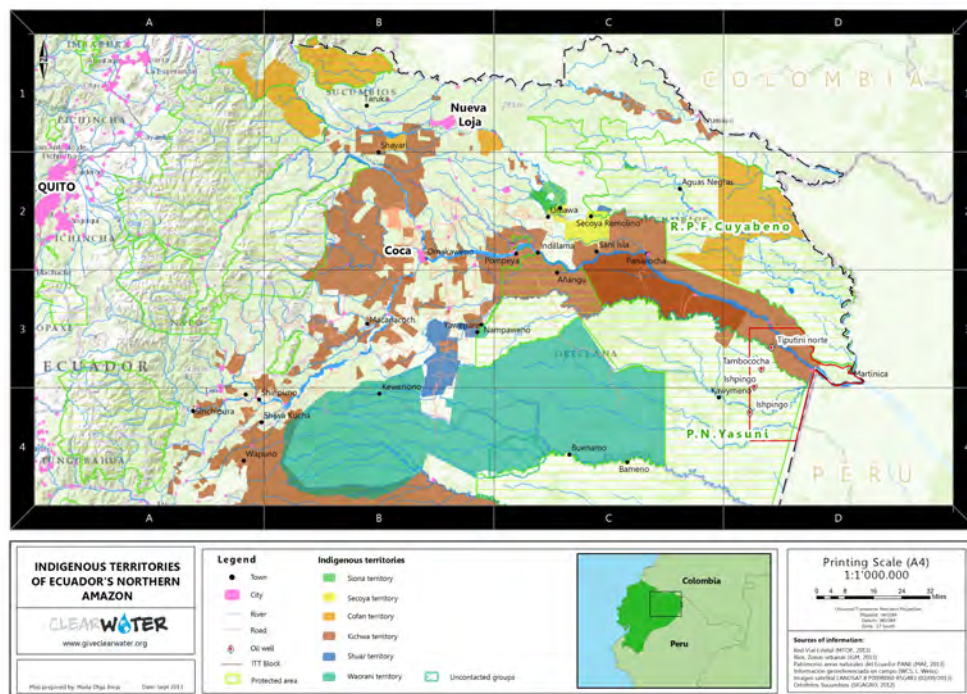


Figure 17 Map of present day indigenous territories in the region, Source: Clearwater 2013.

Drought had forced thousands of farmers from Loja to leave their homes and search for land. Many had settled in El Carmen, Manabí, where others had joined them. At the invitation of a friend, Jorge Añazco had travelled to El Carmen to meet with a group of farmers from Quilanga. It was early May 1969. Largely a generation younger than Añazco, the farmers were

concerned about the future. They spoke of the problems drought had brought, and of the many families forced to migrate elsewhere. Between drinks and to the accompaniment of guitars, Añazco recounted to the group his experiences travelling through the Amazon, “an unknown and distant world for them” (Añazco Castillo 2008:131). And it was there, in that meeting in the home of Erasmo Rojas Martín, who later became one of the founding settlers, that the dream of farming in Lago Agrio was born: “Thus, between drinks, the project of colonization of the *NorOriente* was born, the place where oil had burst forth and there were millions of hectares of vacant lands that would accommodate thousands of *campesinos* who had no land to farm” (Añazco Castillo 2008:131).

The group began to organize. Recording their meetings for posterity, they wrote down their objectives for their project of colonization, which they provisionally named the “Loja Colony.” They outlined the names of the farmers who would make the journey, nominating a small group to make a reconnaissance trip to the region before bringing the rest. The plan was for the group to travel to the airport in Shell and arrange a flight with the Ecuadorian Air Force (*Fuerza Aérea Ecuatoriana*) which ran cargo flights to the military base in Santa Cecilia and, following Añazco’s legwork, had received the military’s blessing to support efforts to encourage settlement along Amazonian borders. After various trials and changes to the plan, in early December 1969, a group of about two dozen, with Jorge Añazco named leader and 1500 pounds of supplies among them, left by bus for Shell.

In his autobiography, Añazco describes the collective excitement as the group took off that clear morning for the Amazon.

From the air we could observe the stunning scenery, made up of virgin mountain ranges and rivers that were playing hide-and-seek beneath the jungle. I was aware of the excitement of my friends, as they were taking on the challenge of the unknown. As the plane devoured the horizon, they contemplated, perhaps for the first time, the breadth of



the jungle and the quantity of virgin land where they could each have their own parcel, in order to make a living for their family. They knew that they were the first group of organized colonists, ready to found a town in the oil-producing sector of the *NorOriente*. (Añazco Castillo 2008:138).

The group landed on the tarmac built by the Texaco-Gulf consortium at Santa Cecelia, next to a provisional administrative complex.

One of the settlers, Josefina, now a woman in her 70s, sat with me in 2012 in the open courtyard of one of the first hotels which she and her husband opened on the Via Quito in Lago Agrio. She describes the moment of arrival as though they had descended from the Noah's ark of the air force, landing in green lands to which God had sent them to live and prosper. Her pride and satisfaction, looking back some 50 years later on their collective efforts to build Lago Agrio into the city it is today, is evident.

We landed, got off the airplane, and the only thing we saw was sky and forest. Nothing more. But thanks to God, this was such a beautiful first impression that he gave us, it was as though God said 'Here will be where you will live, and here you will stay forever' [*'Aquí va a ser a lo que ustedes van a vivir y aquí se quedarán para siempre.'*] So that's what we did. The Coronel welcomed us, he treated us very well, and let us stay the night there [at the base]. They had some crops growing there like plantain and yucca, and he gave us some food to eat. I think we stayed there for two or three days. We rented a big canoe, and we paddled downstream, until we arrived at the place we stopped on the Aguarico, where the slaughterhouse is today. There is where we built some shacks, out of large leaves from the forest [*bijao*].

We were afraid to sleep in the middle of the jungle, in the middle of the forest. I was worried sick about my children. I was terrified of the tiger,<sup>6</sup> of the wild animals. I was so afraid that I had carried with me some mosquito nets from Santo Domingo in order that my children wouldn't get bitten by anything. Because they would swell up from any little bite. My oldest child was 10, and the others were younger, the youngest child I brought was 1 year old – still breastfeeding ... I would cry, cry, and cry because I was worried about my youngest. Like any mother, I tried to cover them up, to cover them up so they wouldn't get wet at night. I said to God, 'If my children die here, what do I do?'

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<sup>6</sup> There are no tigers in the Ecuadorian Amazon, however the term here is likely used to refer to the jaguar or panther.

From these initial encampments, the settlers began to orient themselves in relation to the center of Lago Agrio and Texaco's ongoing construction of the camp and exploratory wells. Lago Agrio in the 1960s consisted of a couple of straw shacks (*chozas de paja*) along a dusty road leading from the oil camp. Much of the area in town was swampy and wet. Neither the state nor Texaco wanted anyone to settle near the oil camp, and they were actively encouraging settlement on the other side of the Aguarico. Arriving settlers ignored them. As more settlers arrived, tensions grew over the land that was being claimed by farmers alongside the growing industry.

As Gonzalo tells it, following a few days of camping out on the Aguarico, they headed to Lago Agrio and began to look for land. The guidelines of the Ecuadorian Institute for Agrarian Reform and Colonization (IERAC) stipulated that each farmer could claim 50 hectares of land, 250 meters along the road and 2000 meters long, half of which had to be made productive. Importantly, IERAC required Indigenous groups already present in the region to establish their claims to land through the same process as the settlers. This led to widespread deforestation and rapid expropriation of ancestral lands as Indigenous groups often practiced crop rotation, or because lands were quickly becoming occupied by settlers while the lengthy and disputed process of titling was resolved (Wasserstrom and Southgate 2013). Many settlers felt that access to land to farm was their right as citizens, leading to multiple disputes over land rights and usage. As another settler described matters,

After that, we started to look for land and orient ourselves a bit because the *gringo* [at Santa Cecilia] didn't have any idea what was along the Aguarico. And we could tell that they didn't want us to take up land there [where Lago Agrio is today]. They were telling us that they weren't responsible for what could happen because this was a petroleum zone where they were going to be putting in a lot installations and tanks and all that. The processing station was already there, those huge [storage] tanks too, so all of that was there and there were three wells already within the town.

Myself and the other *compañero*, we were single. And the following day the other *compañeros* arrived in Lago Agrio and said that they could give us work. The *compañeros* that came with their wives were the salvation of all of us because they were able to work in the shacks [in town]. They gave them work and [the women] brought us food. And since this was jungle, as you know, you would see all kinds of animals here, *guatusa* [agouti], deer, wild pig. All of this was jungle. There were *paujiles* [curassows] and there were chickens. We lived off of all of this. But after a month of being here, [the food stuffs] that we had brought with us ran out. The butter, the salt, the sugar, all of it – there was nothing left. There was plenty of meat, but no salt. So we'd hand out a piece of meat to eat and that was it. We ate everything without salt. That's how we ate until they finished the road.

The first year was particularly hard. Once the road between Lago Agrio and Santa Cecilia was completed it was possible to buy supplies at the military base. Groups of settlers would regularly send someone out on a military flight to Shell or Puyo to buy provisions for the group. Several individuals described their delight upon finding patches of yucca, plantain, and other edible plants growing in the forest in the first months. They had stumbled upon gardens grown by indigenous groups which some took to be signs of divine help. Others recounted with gratitude the help of the military, which initially gave them food. Many described a sense of solidarity among settlers as they collaborated in finding work, sharing food, watching children, and protecting one another.

The gringos worked day and night, and it didn't take even another month before they finished the road to Santa Cecilia. And so then we went on foot to Santa Cecilia, and there you could get just about anything you wanted – plantain, yucca, salt, butter – the army would sell it all to us. They would sell a lot to the families, and to those of us who were single, they'd sell us a pound or a pound and a half of things. And then from there we'd carry it all back on our shoulders because the men who worked in Texaco were selfish, they wouldn't even give us rides. We'd be carrying these heavy loads all bent over; we would be suffering. Some people who came here wound up suffering, they'd leave [the Amazon] crying. They'd go back in the airplanes that Texaco had, they'd take them back to Quito as though they were sick men. I think in the end there were about 20 of us who wound up staying here. I don't know if we were brave or if we were – well, I don't know what we were – but we couldn't leave. We were here to stay.

Once their husbands found work, individuals like Josefina and her sister, who was married to another man in the group, began to work for the oil and contracting companies washing laundry in the rivers. Little by little they were able to put together money and build a house out of cane. Shortly after, they opened a small store. One of the contracting companies would allow her husband to travel with them without charge. He would buy food and other items in Quito and Guayaquil to bring back to Lago Agrio for the store: *food, work boots, clothes, any little thing*. Another member of their group would travel on the military plane to Shell, where he could take a bus to Puyo to buy things. Commerce was rapidly growing as more and more settlers arrived. One described his sense of commitment to making a life there, despite the many challenges:

I never thought about leaving. I said to myself, I'm going to stick it out. If I die here, I die here. Texaco wouldn't even give us one step to be able to enter into their camps. Puhhhh. Treated us like we were dogs. And we lived like that for a year until we were able to start cultivating the land. We grew corn from some seeds that we were able to get from the *indígenas*, and the corn grew quickly and soon we had new corn [*choclo*]. After that we grew plantain, yucca, it grew quickly and within a year we had production. But the hunting, hunting was our salvation. We started to have a life here. And I have to say to you that this: well, the things that were good were good, but the things that were bad were really bad. Yes. Throughout this area this was the territory of the *Aucas*, a savage tribe here. And we would say to ourselves, 'what if we encounter one of them one day and they kill us?'

The decision to stick it out runs like a thread through settler tales. The density of the forest or the ferocity of the animals might have inspired fear, but it also signaled promise. Settlers were awed by the area's beauty, and determined to make a life for themselves.

I've been here forty-one years here in this spot. [When I arrived] I saw this *muñeco*<sup>7</sup> in the middle of the jungle, and I didn't know what it was... After two or three months the road [from Lago Agrio] made it out to where I am [by his house]. So, for me, the road was a huge relief because I had to walk out by foot to get back to town. Lago Agrio at

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<sup>7</sup> *Muñeco* is an informal name for a wellhead that translates roughly to the puppet or figure. Wellheads are painted red for active wells and green for reinjection wells.

this point was just a couple of shacks made out of *paja*. It wasn't like it is now. It wasn't the town that it is now – a city. It was just straw shacks.

As the Velasco Ibarra government (1968-1972) continued to promote the empty lands that were waiting for colonists in the Amazon, colonization proceeded with haste. As new oil camps were opened, access roads cut through the jungle creating branching links throughout the forest. This is true not only of Lago Agrio but the region more broadly: farmland and residential spaces are thoroughly intertwined with pipelines, wells, and stations. Settlers followed, claiming land alongside the roads and well platforms. Joining together, settlers formed cooperatives that allowed them to obtain official land titles from the state. Yet the expansion of the two was often in tension. As Añazco notes, many settlers were motivated by a desire to provide for their families and believed that they had the right to occupy the land, and that settlement would improve the place. The farmers did not, however, consider the oil industry to be motivated by concerns for the greater good, even though settlers were excited by the clamor and promise of development through oil revenues they had heard about in the news and political speeches: “The advance of oil represented the power of technology and money, the ambition of accounting for barrels of oil and transforming them into dollars that would fatten the bank accounts of the companies and of the government. The advance of the settlers meant the conquest of this vital space [*espacio vital*] needed to survive as a human being, as a family and as a society.” (Añazco Castillo 2008:168).

### ***Lago Agrio grows***

A region historically part of trade circuits from the mountains to the Putumayo and the Peruvian Amazon, Lago Agrio's growing population began to attract more traders. They ranged

from established merchants to people who came on a whim to see if they could sell clothing and other goods on the burgeoning frontier. One such individual was Lupe, an accomplished seamstress with her own business in Quevedo, who struck out for Lago Agrio in 1980 with two suitcases filled with clothes, jewelry, purses, shoes, and perfume to test the waters. Descending down the bumpy, winding road over the Andes on the Zaracay bus sitting next to a woman who worked as a secretary for Texaco, she described to me her joy at seeing the pipelines for the first time. This was the sign that they were heading to the land of oil that she had read so much about in the newspapers!

I went walking through what was the center of the city, and I sold my merchandise. There was only one store. And so I went down the Avenida Colombia, and I met Mr. Rivas, a trader, who had a wooden house, a big shop. I went in and he bought a gold bracelet from me, rings, earrings, gold chains for him and his wife, and he said to me, 'Señora, stay here in Lago Agrio! Business here is good!' And I said, 'Yes, but I just came to see how things are here.' And he said, 'Go further down the street where there is a brothel [*chongo*].' And I said, 'What is that?' 'That's where the women are. Ask for permission to go in and you'll see you're going to sell all these clothes you brought.' And so I went to this *chongo*, called *El Boricua* [The Puerto Rican]. I talked to Mr. Villanueva, the owner, I asked for permission, and then Americans, Colombians, Brazilians, Cubans – lots of beautiful women came out – from all different countries, right here in Lago Agrio.

Upon leaving the *chongo*, with her now lighter suitcases, Lupe waited by the side of the road for a ride. To her surprise, a truck passed by with a man she knew from her childhood in the highlands. Stopping to pick her up, the man and his friend showed her around town.

*Lupe:* So I found them out here in the Oriente! They took me back to town, they carried my stuff, showed us around all of the oil camp, because it was something really exciting to come here and see all of the wells.

*Amelia:* What did you think when you saw the first well and the oil camps?

*Lupe:* Oooo. Very exciting! It was very impressive! This was the first time I had seen this here in our country – all the gringos. And so around 8pm, when Mr. Altamirano left me where I was staying, he said to me, 'Tomorrow, you should go to El Coca, because you'll sell even more there.'

Delighted with her success selling her wares in Lago Agrio and in the other major oil hub, El Coca, Lupe returned to Quevedo inspired. She began to travel frequently, working in her tailor shop for a week and then making trips to Lago Agrio to sell the clothes she had made. Gradually she began spending more and more time in Lago Agrio. More settlers were arriving and business was good. The central street had several bars where people would gather to drink, gossip, and sell things.

You know in the center of town, where the Avenida Amazonas meets Via Quito? In these times, Mr. López had a bar [*chingana*] where people came to buy drinks – strong drinks, like cane alcohol [*aguardiente*]. The *indígenas* would come to drink there. And Mr. López said to me, ‘Look, you go around selling gold jewelry, well the *indígenas* here sell gold. But don’t go asking them how much they have or how much it costs. Give them a pile of five dollar bills,<sup>8</sup> and they’ll give you the little tube they have that is made from the feather of the turkey vulture, that’s where they carry the gold.’ And so I would buy gold from them. I would always go and buy. And then when I had gotten together a good amount, I went to Guayaquil to a company that bought gold. I bought a lot of gold. I would buy it from them cheap because they didn’t know what it was that they were selling. With the gold that the *indígenas* were selling in these times, they would just drink [the money away]. They’d be walking around with their spears, with their noses pierced, with their ears, in their traditional clothes. So I got used to life here, and I stayed here in Lago Agrio.

In addition to the growing service industries – pipeline and maintenance companies, restaurants, laundries, hotels – economies of alcohol and sex followed oil development. In Lupe’s account we see traces of these peripheral economies that shaped the town and the interactions between indigenous groups, oil workers, traders, and settlers. The sale of new products, a growing market economy, and different notions of value and exchange began to emerge, seen also in the growing interest in panning for gold in surrounding rivers.

From the very earliest stories about this era and the arrival of oil, people mention the ever-present sex trade. Even when discussing the most remote oil wells and camps, people talk of shacks erected for prostitutes. Oil workers named wells after their favorites: Joan, Fany,

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<sup>8</sup> The Ecuadorian currency at the time was *sucres*.

Miriam, Sonia, Dorine. The most famous prostitutes had stations named for them, such as Mariann Vieja. *Chongos*, or brothels, popped up on Lago Agrio's streets, their oversized metal doors pulled down to expose their patrons only from the knees down to the street, the smell of stale beer fermenting in the heat of the day. Today, as you enter Lago Agrio and other surrounding towns, the peeling walls of the "*Casas de citas*" are covered with painted murals of jungle scenes, depicting oversized green leaves that obscure the illicit promises of the larger-than-life bodies of exotic women plastered on the walls. A hyper-sexualized nature lays in wait to be conquered. The *chongo* Lupe describes still exists on the way out of town on the Via Colombia; there are several others next to it.

Lago Agrio was growing rapidly. The roads were still dirty. The oil companies covered them in crude, sometimes at the request of locals, to keep the dust down. This resulted in an impossibly sticky mess whenever it rained. As time went on, a hospital was built, yet basic services such as electricity remained scant. In order to run her tailoring shop, Lupe would cut all of her cloth during the day so she could maximize the four hours of electricity in the evening to run her sewing machines. Others describe frustration with the lack of public works such as paved roads, water, social services, and even the absence of basic supplies in the hospital and other facilities. The place kept expanding, but services did not develop apace. Strikes became frequent: residents protested their political and economic marginalization by blocking roads, taking over public spaces, and making demands in reaction to what they considered the state's abandonment of Amazonian provinces. Claiming land for farming, albeit sponsored by the state, was often in conflict with the spread of industry. Many settlers were unhappy about a petroleum politics dictated by the political and economic interests of the government without respect for the people who were living in the territory.



Discontent remains, although the reasons for it have changed. When I asked interlocutors about life in the Amazon, they often would say something like this: *All of the country's wealth comes out of here, and what do we have to show for it?* Indignation at the low level of state investment in the region was common. Today, the Amazon remains one of the poorest areas of Ecuador. The census of 2011 found 59% of the population in Sucumbíos living in poverty; making it the poorest province in the region with twice as many poor people as the nation as a whole, at 26% (Ministerio de Coordinación de la Producción, Empleo y Competitividad 2011). The level of unmet basic needs (NBI; Necesidades Basicas Insatisfechas) in Sucumbíos is estimated to fall between 71% (López 2010:34) and 82% (Espín 2009:20). This means that basic standards for housing, sanitation, education, and minimum income are not met. By 2015 the population of Sucumbíos was over 176,000, with most people living in rural areas.



*Figure 18 An aerial view of Lago Agrio today, taken from the airport looking West. The oil storage tanks and station are visible to the left, with Via Quito running west and Via Colombia curving north in the foreground. Photo by Marco Haro 2011.*



*Figure 19 View from Via Quito in downtown Lago Agrio, looking East toward the airport.  
Photo by Marco Haro 2007.*

### *Not even a pig left as a witness*

After a few years, the first settlers began to notice some of the environmental effects of oil extraction. Because daily life was so intertwined with industry, they were quick to observe the oil floating downstream in the rivers, and the clouds of smoke coming from the burning waste pits. For those with property containing wells, this was particularly the case. While narrating the story of his farm, Gonzalo moves quickly between describing his fruit trees and industrial practices, his frustration at how things had proceeded evident even years later.

We started to feel the effects of contamination when we started growing plantain and yucca and fruit trees, like lime. And so when they started to extract oil, there was this well and a few others that they were in the process of drilling, and in the ground there

were some huuuuuge pits, some 20 meters long. And it was in those pits that they dumped and burned the petroleum, and it was as though the land was on fire. You couldn't leave your clothes to dry outside because the clothes would be covered in ash. And in the water, we started to see this black scum on top. You had to be very careful. Sometimes the river would run with oil. And that was how we lived.

I tell you, after about two years of this, that's when the productivity we had started to drop, the plantain, yucca, started to – it wasn't like before. The corn, the yucca, the lime more than anything else since it's the most delicate, the lime started turning black on the trees. And the trees wouldn't bear fruit. Maybe one or two pieces of fruit [on the whole tree]. Nothing produced like it did when we first had arrived. During this time, they covered the roads with pure petroleum and rocks from the river. And this would turn into something like pavement ... And in Lago Agrio, they covered the main streets with oil in order to keep the dust down.

We didn't know anything about contamination. I tell you that we didn't know anything ... All of the contamination started with the running of the oil. We weren't afraid because we didn't know that it was bad. Because nobody said anything. Now people complain and ask, 'why didn't anyone complain before? The *gringos* were here, why didn't people complain then and defend themselves?' Nobody said anything. Why? Because there were nationals [Ecuadorians] who were bosses, engineers and all that, and in this time period they made a huge amount of money. So it didn't matter to them that the rest were suffering the consequences of contamination.

Given the economic value placed on petroleum in Ecuador and the controversial *Aguinda* lawsuit, claims that connect the loss of productivity of the land to industrial operations are subject to much dispute. Frequently, when I raised concerns such as these recounted to me by interlocutors about the effects of contamination while speaking with employees of the state oil company, regulatory agencies, or those aligned with the defendant in the *Aguinda* lawsuit, they would respond that residents and environmentalists were too quick to attribute contamination or loss of natural habitat to oil operations. This has also been one of the central refrains in the *Aguinda*. Chevron representatives claim that the intestinal problems and skin rashes residents in the region experience are due to poor sanitary infrastructure rather than toxins from oil. Indeed, the lack of basic services such as water provision, sewage treatment and waste management in the region for the first several decades of oil development, combined with the effects of African

palm cultivation and the use of pesticides in agriculture and chemicals used to kill fish in the rivers have created a situation in which there are many possible threats to human and animal health in the area. On more than one occasion, employees of the Ministry of the Environment and oil workers described to me their disgust for *campesinos* who they saw as more interested in seeking monetary compensation than in remediation of environmental damage. Some attributed this to a history of paternalism by companies inherited from the early decades of oil. Others wrote it off as economic self-interest. Some argued that what farmers called a loss of productivity was due to intensive farming in inappropriate soil.

I raise these issues in order to sketch the arena in which accounts by people like Gonzalo circulate. As Li (2015) reminds us, claims about polluted water or declining productivity due to contamination from extractive industries cannot be glossed as simply resource ‘conflicts’ reducible to interests or bias. Rather, attending to what farmers say about early decades in the *Oriente* reveals how different actors have experienced harm as tangled within the hopes of building a new life, the interests of the Ecuadorian state, and uncertainty with regards to this new industry. Along with the forms of expert knowledge that speak to questions of toxicity, exposure, and causality in subsequent chapters, these voices are also interpretive, critical, and partial. My intention here is to produce an account that recognizes the historical contingency of all knowledge claims and the means by which we each make sense of how oil changes people and places (Haraway 1988).

Gonzalo was not alone. People told me many similar stories in response to my question. Many remember noticing the effects of contamination on their crops, livestock, and health within a year or so of their arrival. Patricia, a settler with a young family who arrived around 1971, told me the following:

Well, I'm from Loja. And I tell you, I didn't know anything, didn't know what petroleum was. We came from far away, almost near the border with Peru [in the south of Ecuador], and I tell you we came here to see something new, to feel what it was like to live in another world here in our own country. Arriving here, I saw new things, most all the fauna, the flora, the jungle. There were some huge trees, tremendous trees. And different flowers too ... Here, we saw another world, there was so much fishing, I tell you – even in small streams, you would catch some huge fish up to a pound and a half. It was beautiful here. There were also lots of birds. There were *paujiles*, turkeys, *guatusa*. But we didn't know how to hunt them. Because I came with my young family. The oldest was 14, 11, the others 9, 7, 5, 3, and the youngest 2 months old. I liked it here, even though in this time we didn't have all the things we needed, like plantain, yucca, and we didn't even know anyone here.

There were also tigers.<sup>9</sup> [*Sha! Sha!* Claps at chickens wandering through her kitchen] But I tell you, all through this area, this was the runway of the tiger. Around 5 in the afternoon you'd see the tiger go by over near where the [PetroEcuador] station is. I tell you, I nearly became anemic because I wasn't eating out of fear of the tiger. Fear of the tiger! The tiger would eat our dogs, pigs, but most of all the dogs. And other than this, there were deer, *guatusa*, *guanta*. All of this was good for my kids for hunting, we were never lacking for meat. But after this, what happened? After this, the oil started to spill. A substance, black, started spreading – First the machine would come by, removing the rocks from the roads ... and then they'd put down the oil. And everything would be coated.

I tell you, all of our clothes were damaged. Oil is sticky and, when it was hot out, in the sun, because the sun is strong here, there was no way to walk because the oil [on the roads] burned your feet. It would cause blisters, all of that. So, that's how things started, first our legs started to hurt, we started to get cramps. And we said to the engineers from Texaco, 'Why do you spill oil?' And they said, 'No, no, oil is not harmful. Petroleum is – it's a form of medicine. Petroleum can be used for pain, for pain in your bones, for whatever.' So we were unconcerned, out there swimming in oil.

Patricia's account is like others in emphasizing people's ignorance of the health problems that can result from exposure to products used in oil operations. This oft-repeated anecdote claims that Texaco workers told residents that petroleum was good for curing the aches and pains of arthritis, instructing them to place it directly on their joints. This story is iconic of the view espoused by Patricia, one of the plaintiffs in the *Aguinda* case, and others that the oil company and the state at best left an ignorant population in the dark, and at worst, intentionally exposed

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<sup>9</sup> See earlier note on the word tiger.



them to harmful contamination. Still, incredulous of her claim that initially she and her husband were not concerned about the health of their family due to the oil operations, I asked her about it again:

No, we weren't worried because they told us this, that petroleum wasn't harmful [*que no era dañino*]. Then they started to dump [the oil wastes] – and those waste pits overflowed when it rained. And it started running into the streams. And we used the water in these streams to wash, because it was from these streams that we got water. For cooking, for drinking, for everything. But afterwards there wasn't any more water. Not for cooking, not for washing, even less so for drinking. Not for anything. Why? Because it was dangerous. There was a skim, a thick covering, sometimes two or three centimeters thick, sometimes up to five centimeters thick – a layer that was made out of crude. So that's why I tell you, it was hard. It was hard, really hard, for us.

So we started to complain, but they said that this land belonged to the state. That this property belonged to Texaco because they had bought this land. And the people started to say, 'No, we're not going to leave here just because [they say so].' And even more [settlers] started to arrive instead of people leaving, even though [the company] wanted us to leave. Because, how were we going to leave if they take away our Oriente, our territory, where are we going to live? The majority of us were from the southern borders, and we came because of the drought. There was a tremendous drought in Ecuador. The animals looked like skeletons. They didn't have anything to eat or water to drink. So we came here trying to survive, to give life to our children. To have a life for ourselves and to be able to raise animals.

It did not take long before people started experiencing health problems. People told me about skin rashes from bathing in the river, persistent coughs and respiratory problems, miscarriages and malformed infants. For some, ill health began as a vague series of complaints. Others mentioned specific incidents of exposure that triggered miscarriages. Patricia tearfully recounted three miscarriages, along with other related problems from chemical poisoning.

I tell you, Amelia, that we have given our lives here. Thanks to God, my children are all alive. But everyone suffers from ailments. I had three miscarriages. Of the three miscarriages, the first was because I crossed the stream, I had been washing [laundry]. I was washing when before we knew it a stain of black oil was floating downstream. And we got out of the water. But since I had left the clothes on the other side, a whole tub of clothes on the other side, I risked crossing the stream. I got wet up to here on my legs, covered in oil. The water was floating down with a black layer on top, but underneath the water was a gray color. It stunk. A horrible smell. And then I started getting dizzy,

vomiting, dizziness with vomiting, and then *tsaac!* All of a sudden I had pain in my stomach, pain in my hips, all through the middle of the night.

After three and a half months [of gestation] I had the first miscarriage. The other two miscarriages happened at more or less a month and a half. But this was a smell that followed you, terrible. Once [another time] we had to pull a young bull out of an oil pit. The animal had fallen in. So, there wasn't anyone [to help] so I went with my husband to pull out the bull that was stuck in this waste pit. There was just this part of the neck and the head [above the surface] the rest of the body was submerged, and so we went to help him. And I just stepped in the oil a little bit, and that was it. And after that I felt like I was dying. From there on I started to become anemic, and had these miscarriages. I had to travel three times to Quito, you could even say I was more dead than alive ... What I had was a poisoning, a poisoning because with all of the vomiting and the headaches I felt like I was going crazy.

The plot of land on which Patricia lives today with her grown children and their families is adjacent to one of the first stations Texaco built. The station includes multiple storage tanks and gas flares that still burn 24 hours a day. When you enter her property, depending on the direction of the wind, there is an unmistakable smell of gas. The generator behind the fence runs at a constant dull throb. Once, while speaking to her adult son, he told me about debris that would catch fire in the gas flares and fall down on them, like flaming bits of smoldering rain.

They would light the waste pits on fire where they would store the oil.<sup>10</sup> And the fire would make these terrible columns of smoke. Black, but thick, like when you're making marmalade. And in each part of these columns, you could see this big thick cloud. That's how it was. It would start like that and then within an hour and a half or so, then it would rain. And with the rain, all of this smoke fell over the plants. Stained all the plants, the clothes too if they were outside. Sometimes we weren't at home, and when we got back all of the clothes would be stained black. We wouldn't have any clothes to wear. The plants would all be bathed in this [toxic rain], it would damage the roofs of the houses and we wouldn't have any water. And in the water tanks that we had started to build would be covered too.

So that's why I tell you that it was really hard for us. After that the animals started to lose their fur. Like that dog over there, [recently] he went over to the river and was crossing over here near the station when he went in the water. And then he started to get like this, look [indicates a mangy dog with sores where much of his fur has fallen out] ... We were

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<sup>10</sup> Lighting waste pits on fire was a means of emptying the pits when they became too full and was reportedly common practice from the 1970s-2000. Burning pits is not permitted under current regulations.



with a group of journalists, they were interviewing us [about problems resulting from contamination] and so we were out with the journalists showing them the pits, the [contaminated] water, all of it. And the dog went in the water. The water was hot, and doubtless had a lot of chemicals in it.

When colonists arrived they not only began planting crops, but also saved money and bought chickens, cattle, and pigs; they dug pools to raise tilapia and other fish. Families kept dogs for protection and hunting. Stories of animals lost to contamination abound: from cows who gave birth to malformed calves, to chickens who ran around fanatically jumping up and down after drinking contaminated water just before dying. Animals died after drinking water in the rivers and streams; on occasion, as with the bull mentioned earlier, they would fall into open waste pits and drown, stuck in the oily slop. Each animal represented a significant financial investment and source of income in a place where wage labor is scarce and wages are insufficient to maintain a family. Many people said they asked the company for reimbursement for these animals.

We used to have cows, and then around 5 or 6 months after the cows had been drinking the water they began to get really skinny. There was a time when we would sell them, but then I started thinking about how they were poisoned...

I tell you that I lost all of the pigs that I had. We used to raise pigs, back here behind the house, I had 80 pigs on about one hectare of land ... And from one night to the next morning, all of these animals died. Of the few that were still alive, we said 'What could this be?' We didn't know what it was from. And then a man who buys pigs to slaughter said to us, why don't you sell me one so I can see what they died from. And I said, 'Look, I have no idea what happened, but they all woke up dead. And no, we can't sell them.' And the man said, 'Let's look and see what they have inside them.' And so they open up one of the pigs, and I tell you that all of the inside was coated in petroleum that the animal had drunk.' It was all ruined inside. The organism of the animal was rotten [*estaba desecho*]. And the animals that were still alive stunk. There had been a spill and my son hadn't realized and over on one side [of the property] there is a small pit and the animals had gotten inside. Because there was one part of the stream and the animals were in the water, drinking the water with petroleum. It killed all of the pigs, there wasn't even one left as a witness.

### *Lago Agrio today*

Generally, the first association made with Lago Agrio in the news, on the internet, or in conversation, is with oil. It is reputedly rough and dirty, a city marked by industry. This is also because of the *Aguinda* case, which journalists often describe in dramatic terms, as an industrial calamity. Take, for instance, this description of the city in a travel guidebook:

This seedy, gray town pulses with the life of the oil industry, a chaotic market, dusty streets, thick traffic and gritty bars. The first oil workers nicknamed Lago Agrio ‘bitter lake,’ after Sour Lake, Texas, the former home of Texaco, which pioneered local drilling. The city’s official name is Nueva Loja, although no one calls it that. Locals settle for ‘Lago.’ Certain realities exist here, including a high amount of prostitution and crime related to the nearby Colombian border: take care at all times, especially after dark. Lago is mainly visited as the entry point to the spectacular Reserva Producción Faunística Cuyabeno (Cuyabeno Reserve), which offers some of Ecuador’s best wildlife-spotting opportunities. (Louis et al. 2012)

While the city is often portrayed in these terms, settlers point us elsewhere. If outsiders see only grit and noise, inhabitants see the product of struggle and triumph: the work farmers did to build lives in a new land, working against the odds in an overwhelming nature and a booming industry.

Once, I sat with Alba, the wife of a trader who worked in the Putumayo and one of the first settlers. We were on her patio, surrounded by carefully trimmed orchids with a pet monkey busily eating guavas nearby, watching the afternoon traffic pass in clouds of dust, horns, and bus boys shouting their arrival. I asked her about to tell me about the changes she had seen in the city, since she and her husband first claimed a plot of 50 hectares of forest here. Their land has now been incorporated within the boundaries of the growing city. *Yes*, she said, gesturing broadly to the left and right, *Lago Agrio is at the center of everything. Over here, the road leads to Colombia, to the Putumayo; this way it goes to Quito. Over here the road goes to El Coca, and that way to Nuevo Rocafuerte. It’s very well positioned!*

Over the past 50 years, lives have taken shape along with the oil industry. Despite being the point of origin for the nation's oil, journalistic accounts often describe it as a peripheral industrial frontier and as a place where Eden fatefully met industry. The lives of those who make this place home are occluded by imaginaries of catastrophe. By drawing on settler accounts, I want to tell of the making of a place in which life goes on, in, with, around, and even in spite of oil. For many settlers who watched the *chozas de paja* grow into a city of more than 100,000 people, Lago Agrio is anything but marginal, and is much more than an industrial zone. For the settlers who shared their stories with me, the Amazon was a place of new beginnings, and remains a source of pride and potential. The face of extractive industries today is not found so much in moments of crisis, but such the quotidian experiences.

The aim of this chapter has been to illustrate how a place like the site of the Aguarico 4 well transform a murky swamp into a site of industry and a flashpoint of environmental conflict in half a century. I have shown how colonization of Amazonian forest occurred at the hands and machetes of settlers and oil companies alike; roads built through the jungle by an oil company, at the explicit request of the Ecuadorian state, were not meant for oil alone but facilitated the movement of hundreds of thousands of settlers. This history, as we see through the tales settlers tell of making lives and growing crops alongside wells and pipelines, has important implications for how people are now in relation to toxins in this region.

Let me provide one final example to illustrate what is at stake in distinguishing between nature and culture in claims about harm. In the *Aguinda* lawsuit, an independent expert, Richard Cabrera, alleged that Texaco's practices had caused deforestation (Cabrera Vega 2008).<sup>11</sup> In response, a team of experts working for Chevron compiled a report to dispute this claim

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<sup>11</sup> The Cabrera report was later dismissed from proceedings due to allegations of corruption and inappropriate collaboration between Cabrera and the plaintiffs. It did not figure in the final ruling.

(Bjorkman, Southgate, and Wasserstrom 2008) analyzing satellite images to determine the extent of deforestation resulting from settlement as opposed to industry. Drawing on work by economist Sven Wunder, they argue that while deforestation is frequently blamed on oil, mining or timber industries, in Ecuador, the Texaco-PetroEcuador consortium had cleared 4,415 hectares for platforms and infrastructure, for a total of 1% of the total area of the concession. In contrast, using the same images, settlers were responsible for felling 241,000 hectares of forest by the year 2000, equivalent to 54% of the same area (Bjorkman, Southgate, and Wasserstrom 2008:5–6). Lest it is not already clear, settlers have definitively transformed the Amazon. Yet, these stories make clear, lines between industry and settler lives are blurred. As I will show in the following chapter, the ways these processes grew together has critical implications for making ‘toxic relations’ of this place.

Throughout this chapter, I have shown how the lives of settlers were interwoven with the oil industry in the creation of Lago Agrio and the surrounding region. It is impossible to understand controversies over both past and present oil operations without understanding harm as a product of these entangled histories. By approaching harm as emerging from these natural-industrial assemblages our attention shifts away from strict notions of causality to expand the scope of expertise by which we make sense of what happened on the banks of the Aguarico half a century ago. This text proceeds from this premise, making the case that in order to address the consequences of oil operations we must be attuned to processes that are neither spectacular nor instantaneous but rather incremental and accretive, whose repercussions play out across a range of temporal scales (Nixon 2011:2).

## ***DESNUDA FRENTE A LA CONTAMINACION: TOXIC EXPOSURE IN THE AMAZON***

### ***Desnuda frente a la contaminación***

In his Quito office, Camilo was showing me slides from a presentation he delivered at Brown University a few years before. A trained biologist, he lived in the Amazon in the 1990s and has since worked on environmental issues associated with oil production, as well as on the *Aguinda* lawsuit. We clicked through slides reviewing the operational practices of Texaco. He had put together the slideshow to explain how people in the Ecuadorian Amazon come into contact with the industrial chemicals used in oil production. As we spoke, he stopped, hovering over a slide in which he had placed two images side by side (See figure below).

The first image is captioned “EPA’s polluted Guy.” It is a graphic of the different means by which a generic person could be exposed to toxins in a generically contaminated site. The second, a photograph of a young child sitting on a dirt road with oil residue in a non-specific location in the Amazon, he has titled “Ecuador’s polluted kid.” These two images, he says, are essential for understanding the nature of toxic exposure in Ecuador’s oil industry:

This for me is important. Because this is how the EPA sees people who are exposed to contamination. And this is how it is here. He has no shoes and no shirt ... If you’re in the United States on a contaminated site, normally you’re like this [“EPA’s polluted Guy”], and not like this [“Ecuador’s polluted kid”]. Thus, the contact that our people have with contamination is much closer ... Whatever scientific study you might do on contamination, or whatever you might know from the US, well it’s different here because we live differently. People here are much more naked in the face of contamination [la gente aquí está mucho más desnuda frente a la contaminación].

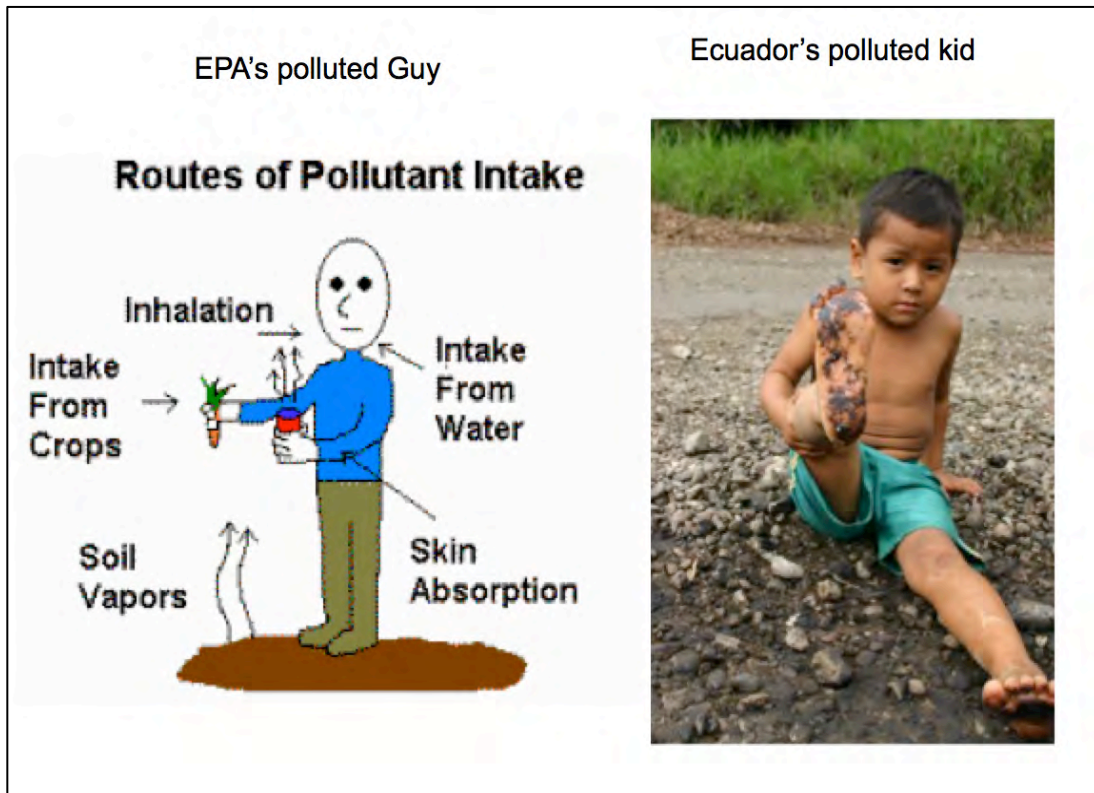


Figure 20 A copy of the power point slide presented by informant.

*“Naked in the face of contamination”* makes bare the vulnerability of residents of the Amazon who live alongside oil. The issue of toxic exposures encompasses a range of concerns, from the physical proximity of bodies to chemicals to the political-economic structures that place some, and not others, in the wake of contamination. *Naked* refers to the ways that unprotected bodies – such as the boy’s extended crude-stained foot, or his hands and uncovered upper body – come into contact with chemicals from oil operations. *Naked* refers beyond skin to the proximity of people’s homes to waste pits; to the unfiltered water in their wells that, for lack of better option, they drink despite the smell of oil; to the lack of resources to protect themselves from exposure within an industrial-natural landscape. To expose is to lay open, to reveal, leave unprotected. To expose is also to make visible through technical, scientific, legal, social

mediations.

The toxins used and produced in oil extraction and processing cross boundaries, from the plastic industrial membranes installed to contain the contents of wastepits, to the fleshy membranes that cover human bodies. The movement of toxins throughout environments – in soil, water, and air – and into the bodies of organisms – across skin, or the blood-brain barrier – is one of their distinguishing features. Toxins effect changes that are unanticipated and forceful. However, identifying, measuring, and demonstrating exposures to toxins outside of the laboratory is a problem. Combinations of chemicals, changes in industry practices, the dispersion of chemicals through air or water over time, the movements of people between locations and jobs and daily activities all make understanding exposure exceedingly difficult. As Camilo illustrated through his contrast between the “EPA’s polluted guy” and “Ecuador’s polluted kid,” the nature of exposure in the Ecuadorian Amazon is different from generic models of how toxic exposure occurs.

Questions about if and how the residents of the Amazon are exposed to toxic chemicals continues to be disputed. Despite much investigation of the effects of specific chemicals on human health in relation to the *Aguinda* lawsuit, the matter is far from settled. Toxic exposure implies contact between a living organism and a toxic chemical in a particular time and place, even though the effects of that contact may extend long into the future after the ‘moment’ of hazard has passed. This chapter argues that in order to understand toxic exposures, toxicity must be refigured – it is not a property of chemicals alone, but emerges within particular relations between people and places. Here I draw from Murphy’s theorization of the “molecular relations” of petrochemicals. Murphy argues that life today is linked by relations that extend beyond the organic realm of hydrocarbons and bodies to create connections between landscapes, production,

and consumption (Murphy 2008, 697). Exposure emerges from the particular histories and political economic structure as these converge in a specific place. As shown in the previous chapter, this includes the history of state sponsored settlement, decades of operations by a largely unregulated oil industry, and the broader political economy of oil in Ecuador.

I take up the problem of toxic exposure in the Amazon by examining how specific practices make toxic exposures visible. I open by reviewing some of the challenges to demonstrating exposure in the fields of toxicology and epidemiology. I then move to three interventions into the matter, beginning with the life histories I recorded as an ethnographic technique to understand how exposure occurred over time and the accounts of interlocutors about the presence of toxins in their lives. These are not stories of generic exposure like the “EPA’s polluted Guy,” but rather follow Camilo’s insistence on the particularity of lived experiences of exposure in the Amazon. Following this, I discuss epidemiological studies undertaken in the region to track the distribution of exposures and their effects, I follow a specific disagreement among researchers in order to illustrate how the bounding of toxic relations bears on knowledge claims about harm. Finally, I return to Camilo, to illustrate a tactic used in the *Aguinda* lawsuit to demonstrate the existence of contamination in the past, which involved moving between aerial images and sites on the ground. In each of these examples, I show how toxic relations emerge within each intervention, as well as the limitations of each technique for apprehending exposure.

Scientific techniques and knowledge practices have material consequences not only for how exposure is made real. Such “practices of knowing are specific material engagements that participate in (re)configuring the world” (Barad 2007, 91). Given the ongoing contests in the Amazon over how toxins result in harm to people and places, exploring these interventions into exposure is a means to illustrate that all knowledge claims are produced through historical



contingencies (Haraway 1988); each technique makes particular relations of toxicity legible at the expense of others.

### ***Toxic Relations***

‘Toxic’ is a term used for chemicals that provoke adverse effects in living organisms, including damage to organs or biochemical processes that are distinct from the mechanism of bodily exposure. Toxic chemicals differ from other harmful chemicals such as corrosives or irritants, which damage only the tissues they touch (Nadakavukaren 2006, 196).

In “Chemical Regimes of Living,” Michelle Murphy opens with the example of the town of Fort Chipewyan, located downstream from oil operations in the “Tar Sands” of Alberta, Canada, where residents had been reporting alarming rates of rare cancers for several decades. Murphy argues that the downstream location of the community is emblematic of the ways in which the molecular relations of petroleum production are externalized from the sites of production into a larger political economy. “Cars, militarization, water, laws, the direction of a river, the price of oil, the properties of sand, the rise of neoliberalism, histories of colonial dispossession – are all part of a complex of *molecular relations* that extend outward in place, and into the past, as well as forward to uncertain futures,” (Murphy 2008: 696). Extending Nicholas Rose’s work on the molecularization of life within biomedicine, Murphy argues for a conceptualization of the molecular relations of bodies, places, and petroleum production. I take Murphy’s point to be not only an extensive sense of molecular connection between time and place (a broad sense of ‘downstream’ and the unknown consequences of oil pollution), but also that paying attention to toxins and their travels points us to the associations between oil production, industry regulation and economic policy, and changes to environment and health.

Pollution from petroleum production is characterized by the presence of hydrocarbons (compounds of carbon and hydrogen atoms) in surrounding soil and water. Hydrocarbons are highly toxic to both people and animals. In the process of being spilled, dumped, leached or burned off the area surrounding operation sites, the molecular components of crude oil are disassociated from the substance itself, traveling through watersheds and accumulating in bodies – forming a web molecular relations. Murphy argues that ecological damage needs to be understood as intimately connected to changes in the molecular composition of the food we consume, and the accumulation of hydrocarbons in the atmosphere as a result of fuel consumption. Her vision of how oil development has reshaped life is sweeping:

It has become a truism that synthetic chemicals have traveled to distant crevices and niches of the globe. Largely produced by over a century of petroleum-dependent industrialized capitalism, these varied molecular modifications range in duration, mobility, and effect, offering us a world changed in ways both subtle and overwhelming. The intensification of production and consumption in recent decades has yielded a chemically recomposed planetary atmosphere to alarming future effect, while it has penetrated the air, waters, and soils to accumulate into the very flesh of organisms, from plankton to humans. Not only are we experiencing new forms of chemical embodiment that molecularly tie us to local and transnational economies, but so too processed food, hormonally altered meat, and pesticide-dependent crops become the material sustenance of humanity's molecular recomposition. (Murphy 2008: 696)

Murphy follows scholarship in medical anthropology on techniques of visualizing life at the molecular level. My concern here, however, differs from her attention to the rise of technoscientific practices and modes of governmentality in the latter half of the 20<sup>th</sup> century. Instead, I aim to frame the question of exposure broadly in order to evoke the relations not only between toxins and those living in the immediate vicinity of oil operations, but also as extending outward to include readers of this text. The relations of toxicity enable and sustain our lives.

Our relations to toxins are many. For each standard 42-gallon barrel of oil, approximately 19 gallons of gasoline fuel are generated. The rest is used to make a plethora of items used

routinely in our daily lives: cars, asphalt, medical materials, computers, clothing, fertilizers, paints, detergent, roofing materials, housepaints, water pipes, clothes, sun glasses, telephones, soaps, food preservatives, heart valves, wheels, trash bags, detergents, anesthetics. These products enter the intimate spaces of our homes; our lives are inextricably dependent upon the extraction of oil.

I begin this chapter by suggesting some of the many connections forged through the production and consumption of petroleum. I do not intend to trace them explicitly, but rather to evoke them as some of the ways that each of us – as anthropologist, as reader, as consumer – are implicated in the concerns of this place. Yet toxic relations are not only about supply chain connections between products derived from oil and their consumption. The capacity of toxins to transgress boundaries (Tuana 2008), whether through their accumulation in the fatty tissue of fish to their movement through the air and into our lungs, have other effects as well. Exposures remind us that distinctions between subject and object, human and non-human are not fixed. As human subjects, we are profoundly vulnerable to ostensibly inanimate particles (Chen 2012, 159).

Throughout my research this point was made clear to me on multiple occasions: following a month working in a community that had multiple gas flares running in immediate proximity to the homes where we were staying, I was unable to breathe. Waking up at night, chest tight, I spent two weeks in Quito, receiving treatment for what the doctors could only explain as an episode of “chemically-induced asthma.” On other occasions, following a visit with government officials to inspect the local toxic waste incinerator or to observe the collection of water samples at a production station, I would spend the rest of the day with a headache, eyes red and watering. Such moments do not compare to the experiences of those who live and work

alongside oil operations every day. I recount them here because these moments are part of what it means to be chemically transformed. This capacity for toxins to affect us, Chen suggests, involves the shifting relations of both *affect* and being *affected* that are central to the experience of being exposed to a chemical. This is also what Tuana refers to as the “viscous porosity of flesh”; those moments when we are made sick by toxins that remind us of the ways that we are in and of the world. The very petrochemical toxins that produce harmful effects on organisms and environments are also what sustain our lives today.

Given that it is enormously difficult to determine the effects of a toxin within a landscape of potential, repeated exposures, or the relationship between multiple toxins and adverse health effects, it is often necessary to reduce the variables of study at the expense of attending to differential particularity. For instance, the question of why, and through what processes, some bodies become subject to industrial waste, while others do not, tends to be divorced from the question of how exposure occurs in toxicological studies. As scholars working in environmental justice, ecocriticism, and anthropology have repeatedly demonstrated, the distribution of poor health and industrial waste traverse pre-existing contours of position and power, including race, class, gender, and political economic position (Pulido 2000; Bullard 2001; Bullard and Wright 2009; Bullard and Wright 1986; Mitman, Murphy, and Sellers 2004; Brown 2007; Lerner 2010; Pellow 2007; Pezzullo 2009; Edelstein 2003; Sze 2006; Harrison 2011; Brulle and Pellow 2006; Checker 2005; Checker 2007).

Like the numerous pits of toxic waste hidden beneath the deceptive green of re-sown grasses throughout the Amazon, exposure draws us to think more deeply about what techniques for understanding harm render visible and what they hide. Existing medical, epidemiological, and scientific research on the health consequences of exposure to the toxic components used in

oil operations leaves much to be desired. Our lack of knowledge of the effects of toxins is every bit as important as what we do know. Thus, this chapter argues that all assessments – legal, scientific, or anthropological – must attend to the ways that poverty, history, and profit are woven into the relations of who is exposed to toxins, and how certain relations are rationalized through distinctions between what is natural, cultural, technological, or material (Tuana 2008, 204).

### *Exposure science*

The effects of exposure to environmental toxins is a subject of concern for a range of disciplines: epidemiology, toxicology, ecology, as well as medicine. While interrelated, each examines exposure through distinct measures of contaminants in the soil, air, and water or through biological indicators in bodies. Broadly speaking, environmental epidemiologists examine interactions between toxins and people at the level of population, exposure scientists work within a subset of a population or at the level of the individual, and toxicologists work at the molecular or cellular level – most often with animal rather than human subjects (Miller 2013, 10).

In an attempt to encompass the totality of the human environment in the study of disease etiology, Wild developed the term ‘exposome.’ A debated concept, the exposome is useful for introducing the complexity of exposure science. As an epidemiological construct, the exposome is an attempt to encompass within a single model all quantifiable exposures and responses, including but not limited to: epigenetic changes, DNA mutations, stress hormones, defense mechanisms, pollution, allergens, infectious agents, nutrients, toxicants, physical and mental activity, social determinants, metabolism, cellular activity and microbiome that exposures entail

(Miller 2013, 4). The exposome aims to speak across disciplines in order to understand the biological alterations resulting from all influences posed in a given environment, with attention to those exposures that are cumulative, low-level or may not usually figure into clinical assessment. The task posed for exposure science, as suggested by the inclusivity of the ‘exposome’ model, is extraordinarily complex.

There are two principal means to assess harm from oil: laboratory studies of toxicity in animals and studies of a human population in the aftermath of an accidental exposure. To move among these disciplines and the objects they produce requires switching the register through which harm becomes evident, from the prevalence of a particular disease within a population, to an individual’s complaints, to the mutation of a cell. There also are many areas of ongoing debate in exposure science. For instance, while scientists acknowledge that environmental exposures likely play an important role in many chronic diseases, the links between exposure and disease remain poorly defined and understood, especially with regard to the interplay between genetics and environment (Wild 2005). In what follows, I discuss some of the challenges to determining exposures to toxins as background for the following discussion.

Toxins can enter bodies by dermal, oral, or respiratory routes; the route of exposure affects the toxicity a chemical poses. Scientists have established that great individual variation exists in the uptake, absorption, distribution, metabolism, and excretion of toxins (Miller 2013, 46, 51). Genes also affect a chemical’s toxicity. There is considerable genetic variation among species and within populations, and thus there is great variability in vulnerability to specific chemicals. This presents a profound challenge for those seeking to extrapolate from laboratory studies on animals to human populations. Toxins interact with different human bodies differently, and also interact in unknown, synergistic, and cumulative ways with other toxins

(Harrison 2011, 9). As a result, while scientists know that populations may be exposed at different rates, and that toxins affect certain members of a population (fetuses, pregnant women, children, the elderly, the ill, those with chemical sensitivities) differently, studying these variations is a challenge.

The conditions under which exposures occur also matter. Chemicals can cause acute toxicity: that is, a one-time exposure to a considerable amount of a particular substance may cause serious short-term illness. Toxins also cause chronic toxicity: repeated, low-dose exposures to a chemical may cause harm over time, such as cancer, reproductive and developmental problems, endocrine disruption, respiratory disorders, and immune system depression (Harrison 2011, 31). In short, there is no single variable, no single route, and no average body that can be used as the basis for assessments of toxicity.

For the US EPA, risk assessment of toxic exposure has been a primary target of environmental regulation for 40 years. Currently, assessments of the risks any chemical may pose for human health involve four routine steps. These are foundational for the development of most regulatory standards: 1) hazard identification to determine if a given substance has adverse effects on human health (usually involving animal testing); 2) dose-response assessment; 3) exposure assessment to determine the numbers and types of people who might be exposed to a substance (a highly difficult task because of the absence of actual exposure data; often the models that are developed rest on assumptions about how people and chemicals travel in environments); 4) risk characterization to create a comprehensive picture of adverse health effects likely to occur in exposed populations and their frequency, expressed as a quantitative probability (Nadakavukaren 2006, 200–201).

The carcinogenicity of chemicals has been the primary focus of risk assessment. However, hazardous substances affect human health beyond cancer. Other effects include immune system dysfunction, reproductive or teratogenic effects, organ damage, and nervous system impairment (Nadakavukaren 2006, 200). As many have noted, this predominant 4-step risk assessment model is both technically limited and controversial, raising critical questions about the ability of the predominant risk assessment model to encompass variations such as different durations of exposure, the endpoints of studies, extrapolation from animal to human populations, latency periods, variation among subjects, and uncertainty (Harrison 2011, 43).

To give one example of this model's limitations, the premise of risk assessment is that a certain degree of exposure is acceptable until a given threshold is reached; after that, harm occurs.<sup>1</sup> The dose-response curve, one of the fundamental tools of toxicology and the principal mechanism for determining acceptable levels of exposure to chemicals, relies on the assumption that the greater the dose, the greater the effect. In a dose-response experiment, the first section of the curve indicates the amount of a chemical that can be tolerated without causing harm. Then a threshold is reached, after which the toxin begins to produce increasingly adverse effects. As the dose continues to rise, the curve will level when the dose that produces death is reached. Determination of a safe level of exposure provides the basis for calculating the highest level of a chemical that will not produce adverse effects. A margin of safety is then derived by multiplying that amount by one hundred (Nadakavukaren 2006, 199).<sup>2</sup>

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<sup>1</sup> With the exception of carcinogens, where there is no threshold of acceptable exposure.

<sup>2</sup> This number 100 was arbitrarily chosen based on the assumption that humans are 10 times more susceptible to effects of chemicals than animals, and that the more vulnerable members of a population are 10 times more sensitive than the average healthy adult (Nadakavukaren 2006, 199).



Chemicals are multivalent. For instance, compounds that are toxic at high doses can be remedies at lower levels. Thus, exposure science must deal not only with the fact that bodies respond in radically different ways to chemicals, but also needs to consider the differentiated responses to different amounts of the same chemical. Dose-response data shape regulatory standards, such as the Maximum Contaminant Levels (MCLs) for substances the US EPA allows in public drinking water. The process of determining of MCLs, however, assumes a single disease-causing agent, a clearly defined pathway of exposure, and a controllable external agent, all of which are rarely possible outside of the laboratory (Nash 2007, 174).

Toxicological studies for determining acceptable levels of exposure are fraught for a number of reasons. For decades scientists, social scientists, and activists have known that exposure curves are not always linear (adverse effects can occur with low doses and the effect may not increase equally along with the dose) (Raffles 2010a; Raffles 2010b). Also Stephens (2002) shows with her compelling example of the management of uncertainty around radiation safety in meetings of the International Commission on Radiological Protection, risk assessment paradigms employ models that do not fully encompass the complexity of exposures. Risk is naturalized through notions of “normal” exposure or behavior. Such norms ignore differential vulnerability as well as structures of inequality that determine who gets exposed and how, much like Camilo’s images of the “EPA guy” and “Ecuador’s polluted kid.” In Stephens’s example, the ICRP’s goal was not absolute safety, but rather to provide an appropriate standard of protection for humans “without unduly limiting the beneficial practices giving rise to radiation exposure,” (Stephens 2002, 96–97). ‘Beneficial practices,’ in these discussions, referred to nuclear power. Stephens’ point is that assumptions are built into the production of knowledge of even the most precise scientific facts, such as a dose-response curve or the MCL of a particular

toxin (Stephens 2002, 99–100). What is at stake is not safety in an absolute sense, but rather the determination of acceptable risks and trade-offs between what is “economically feasible” and public safety.

Laboratory studies in toxicology have both clear utility and limits. Most classical toxicological studies examine one compound at a time, and assume a single source of exposure. But outside of laboratories, environmental exposures involve (often unknown) combinations of chemicals. Thus single chemical studies cannot provide reliable prediction of the risks involved in the world (Harrison 2011, 44). Lack of data on exposure to chemical “cocktails,” multiple toxins at once, is especially problematic given that particular substances in combination present a far greater hazard than any of the individual substances alone. Examples of such synergism have been documented for air and water pollutants (Nadakavukaren 2006, 185). As a result, lab methods that measure toxins independently significantly underestimate the risks in sites of environmental exposures.

There is also an explicit temporal concern to exposure science. Even linking acute reactions to pesticide exposures proves difficult due to the complexity of environmental conditions. Health problems that develop after a latency period are even more difficult to associate with past environmental exposures. For chronic conditions, such as cancer, the latency period may last for decades, by which point the sick individual has likely had many other potential toxic exposures due to changes in employment or residence, making it extremely difficult to link the symptoms manifested in particular bodies to particular times and places. Relationships between health and place are extremely difficult to make visible. As Nash notes:

What also matters is the contingent history of the particular body in question ... The quality of ‘toxicity’ emerged out of the relationship among a particular chemical, the surrounding environment, and a particular body with its own history of exposures and injuries. It defied any easy notion of ‘agency’ or disease causation. ( 2007, 147)

In citing the example of models that sought to understand the nature of skin exposures to organophosphates in the 1950s, Nash shows how toxicologists treated the body as a well-defined entity separate from the world. Exposure was imagined as a finite, discrete outcome rather than a process that might involve multiple chemicals present in trees, air, water, and food in a context of agricultural pesticide application (Nash 2007, 148). Toxicological modeling advanced dramatically in subsequent decades as scientists tried to encompass greater complexity. However Nash's example is useful for highlighting a persistent resistance – not only in modeling but also in regulatory measures – to understanding toxicity as dispersed throughout landscapes and as a process rather than an isolated event. The models and laboratory techniques of modern toxicology must treat bodies and environments as if they had clear boundaries, when in fact neither does. 'Exposure pathways' are often represented in textbooks and conceptual models as arrows, suggesting that "that such pathways were narrow routes of entry that could be regulated, tracked, or even blocked" (Nash 2007, 148).

One reason that disputes over environmental health remain so contentious is that the hazards at their center hold essential roles in modern economies (Brown 2007, 2). Drawing on Harvey (1996), Harrison describes the clouds of pesticides that routinely descend upon immigrant farmworkers in the US:

In a context that privileges economic growth, the state is generally only able to intervene when there is quantified, certain scientific evidence documenting links between an environmental hazard and sufficiently egregious harm. Because this is essentially impossible for hazards whose impacts are realized unevenly across space and time, environmental problems have bloomed under the watch of utilitarian-based environmental regulatory apparatuses. (Harrison 2011, 16)

Regulatory apparatuses that presume the ability to conclusively demonstrate the effects of chemicals privilege industrial polluters while perpetuating configurations of inequality and poor health.

In addition to problems with the regulatory apparatus itself, effects that are diffuse, difficult to trace, or inconclusive are minimized through an insistence that a relation between a toxin and ill-health must be irrefutably demonstrated before any regulatory or legal action can be taken. A few examples from the United States show this clearly. Dioxins are one of the classes of chemicals most heavily researched for their toxic effects. Yet, the political and economic implications of identifying the effects of chemicals on health are so great that it took the EPA more than 20 years to release a risk assessment for dioxins. Chemicals are routinely used before their toxicity is understood. Of the 85,000 chemicals registered for commercial use in the United States, less than 1,000 have been tested for carcinogenic effects. Even fewer have been tested for noncancerous effects, producing what some activists term “toxic ignorance” (Brown 2007, 2, 56; Miller 2013, 45). The relation between assessments of risks and the institution of regulations is key to understanding exposure: the contemporary risk apparatus orbits around the question of how much of a particular substance organisms can tolerate without damage.

This overview has outlined some of the central difficulties in moving between the laboratory and real world concerns. While models and laboratory testing have generated significant knowledge about the effects of specific toxins on organisms, there remains much that is not known about the multiple, repeated interactions between people, places, and industry. In what follows, I turn to the stories residents of the Amazon told me in order to illustrate why a close understanding of the connections between people and places is so crucial to addressing toxic exposures.

### *Of and In the World: Exposure in the Amazon*

Let's return to "Ecuador's polluted kid." Sitting on the side of the road, his bare feet give us important clues about how individuals are exposed to petrochemicals in the Amazon. In contrast to traditional models of risk assessment that involve 'pathways' of exposure, toxic exposure cannot be isolated from the place and history in which it occurs. This is not only a matter of differentiating chronic, long-term exposures from acute chemical intoxications, or asserting that there are multiple variables at play. Rather, in order to understand the nature of exposure in the Amazon, we must consider things such as: how settlement and oil extraction unfolded together so that homes were built in close proximity to wells and flares; habitual activities such as walking along roads or washing clothes in rivers that put toxins in contact with skin; or how poverty means that some families continue to drink from and use their water wells despite the smell of oil.

In order to understand how exposures to chemicals occurred within daily life in the Amazon in the past and the experiences of exposure today, I asked people to tell me stories of their lives, to draw me maps of their farms indicating where spills had occurred, or to recount the changes they had seen in oil operations over the years. These stories and maps tell of habitual exposures within a landscape of contamination; they are multiple, varied, and cumulative. They accrete over decades so that it is impossible to isolate singular moments of hazard. Ethnography allows for the elicitation of such stories. In these accounts toxicity emerges in relations between people and industry in a specific place, relations impossible to see from a lab, let alone replicate them.

Lidia lives at the end of a dirt path on the rise of a hill overlooking her grown children's homes. It is a small collection of family buildings with several grandchildren and dogs running about. The road and pipeline form a parallel horizon as she gazes out her front door. Her immediate neighbors are the now state-run oil station on one side, and a sherbet-colored motel renting rooms by the hour on the other. She has lived here for over four decades. Over time, the boundaries of her property, the places where she keeps her pigs and grows her cacao and plantain, have shifted as various industrial incidents have rendered land unsuitable for planting or raising animals.

The soundscape of Lidia's home is filled with the insistent squawk of chickens, the recurrent requests of grandchildren to which she invariably responds, '*ya, mí amor,*' and the grunts of her favorite fat sow tethered close to the door. In the background is the constant drone of motors and gas flares from the station. By 6pm, the flares flash through the treetops against the lavender light of the Amazonian dusk. In the relative quiet of the evening hours, the noise is amplified.<sup>3</sup> The flares are always lit. Some days, depending on the direction of the wind, the smell is palpable. For days after my visits there, my throat would burn.

When you ask Lidia about life next to the gas flares, she will tell you how difficult it is and has been: *ha sido duro*, she echoes. In years prior, a black film coated everything: rooftops, rain barrels, the leaves of planted crops, clothing. Sometimes this still happens, though not as often. The flare emits gasses – sulfur dioxide, hydrogen sulfide, nitrogen dioxide, nitrogen oxide – as well as particulate matter that she and her family breathe, day in and day out. Present too are

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<sup>3</sup> I visited some homes and schools that were situated within 50-100 meters of generators that run constantly alongside the wells. People talked of their requests for a shelter around the motor in order to reduce the noise. In one case, I visited a school where the parents said that the motor was so close to the school that the children were unable to hear in class; in another, parents reported that some children had constant drainage coming from their ears due to the damage from the noise.

other substances: carbon dioxide, methane, ethane, propane, butane, pentane, heptane, and carbon monoxide. Such gasses, as Lidia recounts from experience, can cause headaches that render her and her family unable to work some days; they make eyes red and itchy, throats scratchy, and chests too tight to breathe. The flare leaves ashy traces that Lidia and her family touch and inadvertently ingest by drinking from water tanks or harvesting crops. Throughout my time in the region, I routinely encountered people like Lidia who lived close to flares – sometimes across the street from a well, or adjacent to a well platform. Lidia is not the exception. Many people I interviewed told me similar things.

Despite proximity to the ongoing combustion of chemicals, Lidia is adamant that things are much better than before. This was commonly said by farmers who had lived in the region for decades. Camilo, like Lidia, was quick to note two immediate differences from the 1990s: “Now it is much better. Why? One, they don’t dump oil on roads. Very important. Two, they don’t burn the oil like before, in the pits.” He describes how, after separating water from crude in separation stations, the water is directed through a gooseneck pipe to a series of waste pits. But in the past, they would burn the gas not in gas flares as they do now but through a lower burner directly over the pit itself. The water in the pits contained crude particulates that would burn along with the gas: “*día y noche, día y noche.*” Years ago, when companies lit waste pits on fire, it was routine to see great columns of smoke towering through the clouds, so thick that company helicopters disappeared behind them. Burned petroleum produces smoke that contains carcinogens. Because the flares, and even less so when pits were simply lit on fire, are not perfect forms of combustion, aromatic hydrocarbons that do not combust completely are also released in the process. Regulatory measures and industrial practices have changed over the past 50 years, such

that that the nature, frequency, and intensity of exposure to toxins in the air that Lidia and her family breathe have changed over time.

Lidia's family arrival coincided with the early development of the industry. Her accounts include forms of exposure which, while significant years ago, are fortunately now less of an issue given the end to practices such as road oiling or open waste pit burning. Yet other forms of routine contact, such as spills from pipelines or overflowing waste pits, mean that while walking across their land or tending to their crops, the hands and feet of those who live here are in contact with chemicals today just as in the past. Spectacular events, such as massive pipeline ruptures or animals slicked with oil, do still occur. But to limit an understanding of exposure to such isolated moments would be to miss the everyday exposures that are part of the very fabric of life in this place. Far more difficult to capture, these insidious forms of exposure are just as consequential.



*Figure 21 Boy standing barefoot on crude residue next to a waste pit in Ecuadorian Amazon. Date unknown. Photo credit Manuel Pallares.*



Clean water for drinking and cooking continues to be an unrelenting problem. Once, while visiting with one of Lidia's neighbors, I asked Jorge where the family got their water, given that they lived adjacent to a well platform. The house, in fact, had been built on top of a closed over waste pit. Leading me down a sloping bank away from their house, the metallic cling of his machete cleared the path in front of us until we reached a well on the top of a small hill some 100 meters from the house. This, Jorge explained, was the fifth well he had dug. In each of the other attempts, an oily skim on the water began to fill the hole less than a meter down. So far, he notes, this water seems okay to drink.

Living next to industry places Lidia and her family in explicit relation to toxins. From the time they arrived in the Amazon, she and other women spent hours washing laundry by hand in the streams nearby. Sitting on the riverbank, partially or completely submerged in the water, their bodies were awash in toxins running with the current. She described countless days when the water changed color to a frothy gray, or when they would arrive at the stream to find an awful stench flowing downstream. Contamination from formation waters, crude oil, and other production chemicals ran across their bodies: barium, mercury, arsenic, selenium, antimony, chromium, cadmium, cobalt, lead, manganese, vanadium, and zinc. Formation waters contain many salts and heavy metals, which are highly toxic to humans and can bio-accumulate in fish and other animals. Also present are radioactive elements of strontium 90, radium 226, in addition to aromatic hydrocarbons such as benzene, xylene, and toluene.

When they went to the river to bathe, Lidia and others noted, rashes and skin spots would coat the arms, bellies, and backs of their young children. Many told me of specific experiences of illness after bathing in the river following a spill of formation waters or crude oil. People who live here routinely associate particular illness events – a miscarriage, a chemical poisoning,

uncontrolled vomiting, the death of animals – with changes in the water from industrial activities. Often I heard scientists and oil company representatives contest claims such as these; these are precisely the sorts of health ‘recall’ questions that critics claim provide faulty means of assessing disease due to the inaccuracies of memory and lack of a physician’s confirmation. The problem of finding clean water continues today; it was routine to hear people complain of the hassle of transporting multiple 5-gallon water jugs on the backs of motorcycles because their well water was not safe for drinking or cooking. Others recounted how they purchased water when they had the funds; the rest of the time they drank what came from the well or the river regardless of the smell.

Early tales of rivers that ran black with crude, waste pits that overflowed and filled streams and swamps downstream, or the many documented and undocumented spills in rivers – often from pipelines – are indicative of the widespread contamination of waterways as a result of oil operations. Exposure to chemicals in the water was amplified by the absence of piped water in residents’ homes; people relied on rivers for all their basic needs, and ingested toxins directly through drinking, cooking, and bathing<sup>4</sup>. Today, plants often grow in soil previously saturated by spills, or in close proximity to waste pits. Farmers frequently recounted changes in their fruit trees, declining cacao productivity, or shriveled up fruit after industrial incidents. On several occasions, I was taken to see plantings of plantain, pineapple, or heart of palm growing directly on top of old waste pits. Digging down with an auger or a spade, black soil smelling of crude emerged less than a meter beneath the surface.

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<sup>4</sup> Some families use rivers to bathe, people told me of children ingesting contaminated water while swimming or bathing.

Lidia and others routinely told me of farm animals that became sick and died after drinking contaminated water, after a spill in the pasture, from asphyxiation due to the gasses from flares, or after falling in waste pits. Farmers recalled pregnant animals that miscarried, or simply became so skinny that they died. Upon opening up the animals, their insides were found to contain crude residues that the animal's body had been unable to process.<sup>5</sup> In a 2003 study of families living close to oil installations, researchers found that 94% of those surveyed (1,520 people) reported having lost animals due to contamination. This included an average loss of 8 cows, 5 pigs, 2 horses, and 43 chickens per family. The same study found that families on average had lost 3 hectares of coffee, 1.3 hectares of rice, and 1.6 of corn to contamination, for a total of 2.6 damaged hectares per family (Maldonado and Narváez 2003, 9). Such numbers offer a sense not only of the economic impact on family resources, but also of the entwinement of people's food sources with toxins. Experiences of losing animals are so common that people imitated specific animals' peculiar reactions to chemical intoxications to me: the chicken, for instance, who after drinking contaminated water, dances about wildly in her last moments.

Working in the oil industry means another array of possible exposures in addition to those posed by residence. Relatives, most often male, employed in companies to work in a range of positions or do small contract work are exposed to toxins during exploration, drilling, production maintenance, or clean-up activities following spills. Each kind of work poses the possibility of exposures to different combinations of chemicals. Remediation or spill cleanup includes the physical removal of crude oil from waterways, and the collection of oil-covered sticks, brush, and biological materials. Drilling activities involve working with or in proximity to lengthy lists of toxic chemicals: aluminum silicate, anionic polyacrylamide, caustic potash,

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<sup>5</sup> Maldonado and Narváez corroborate these stories told to me in my field work regarding loss of animals across the regional.

sodium carbonate, barium sulfate, sodium polyacrylate, uintahita-gilsonite, lime, polyvinyl sodium, barofibre, mica, detergents, caustic soda, radioactive elements such as iridium 190 and 191, uranium, thorium, strontium 90, radium 226, as well as heavy metals such as cadmium, lead, mercury, arsenic, cobalt, copper, iron, selenium, manganese, molybdenum, antimony, barium, magnesium, silver, thallium, titanium, tin, zinc, chromium, and vanadium. Some of these are carcinogenic; others irritate eyes or skin or respiratory and digestive systems. David talked of the emotional burden of working with such chemicals and the physical exhaustion that results from high stress, long-hour shifts. Some 15 years since his last position as part of a drilling crew, he said he knew he had to leave the company when he was waking nightly in sweats from nightmares of things gone wrong with the radioactive materials. Now a bus driver, he is still visited by these memories, emphatic that he will never return.

Work in separation and pumping stations means exposure to de-emulsifiers, such as methylbenzene, xylene, ethylene, and toluene; de-foamers, such as dispersants and flocculants; inhibitors, such as ethylene glycol and diethylene; as well as corrosion inhibitors, bactericides, and fungicides. Like disputes over fracking in the United States, patents protect many of the exact contents of these chemical solutions. I spoke to many people who had worked for oil companies over the years (mostly men). Generally residents held temporary 3 or 6-month positions, doing manual labor. Others worked on drilling or cleanup teams, or in transporting materials or as security for well sites. Many had worked in multiple sectors of the industry, taking employment as it became available, or rotating the few coveted company positions among the neediest families in town. With frequent turnover and individuals generally working in multiple domains of oil operations over a career, producing a comprehensive account of when individual workers might have been exposed to particular chemicals for precise periods of time

in their work history would be impossible.

These accounts suggest how difficult it is to encapsulate exposure as a bounded moment. Toxins flow around Lidia and residents as molecules in the water and the air. Exposures are both general (the gases are in the air that everyone breathes) and individuated, falling differently along lines of gender, position, and age (women who wash clothes, men who work in industrial positions, changing divisions of labor involving who tends the animals and crops). In short, toxins are not isolates, as they can be in the controlled conditions of a laboratory. To live here is to live in relation to oil.

### ***The relations of knowledge production***

The stories told by Lidia and others give us a sense of how lives alongside oil operations are transformed by petrochemicals. Exposures are multiple, differentiated, and rarely recorded when they occur and point us to the particular ways in which farmers, oil workers, and women might come in contact with toxins. Yet anecdotes cannot make visible the health effects of operations at the population level, or specific determinations of disease incidence resulting from exposures. This kind of data is required in order to make legal or scientific claims about harm from oil. The limits of these autobiographical and personal stories for proving harm in official forums are evident.

The *Aguinda* lawsuit sparked interest in the region, and drew epidemiologists, toxicologists, and biologists invested in determining the effects of toxins on bodies, rivers, soil, and air. Subsequent research has been completed by the Ecuadorian state, industry scientists, and scientists working in conjunction with the plaintiffs and environmental activists. In the context of *Aguinda* and disputes under the Correa administration about the future of extraction, the results

of nearly all of this work are contested. To offer a sense of how great the differences in these contests are, in one article a pair of prominent epidemiologists known for their work in the region concluded that the situation in the Amazon constituted a “public health emergency” because of the adverse impact on environment and health, including excess cancer rates (San Sebastián and Hurtig 2004). In response, the authors of a rebuttal prepared for Chevron, concluded, by contrast, that “[c]urrent epidemiologic literature evaluating the potential health risks of petroleum products and petroleum workers finds no excess cancer risks” (Kelsh, McHugh, and Tomasi 2008, 8). No common ground may be found between these positions. Such polemics characterize disputes over research on health effects from oil in this region, because so much of it has been conducted in the context of the *Aguinda* lawsuit.

There is much at stake in the boundaries we draw when thinking through how oil operations refigure life. In the prior section, my aim was to draw out the relations between people and petrochemicals broadly speaking, using the words of my interlocutors as a guide for how far these connections lead. But, representatives of Chevron or PetroEcuador are not interested in understanding toxicity expansively. They sharply restrict their discussions of toxicity to bounded times and places. ‘Cutting’ toxic relations takes many forms: defining exposure as an isolated moment; myopic attention to exposure ‘pathways’ at the expense of intersections of risk; and, as will emerge in the epidemiological debates I discuss below, an insistence on an impossible degree of empirical distance. I focus here on a dispute between epidemiologists concerning health data in the Amazon to explore one such contest over how to conceptualize toxic relations.

Beyond the methodological difficulties that trouble environmental exposure studies in general, there are many additional concerns peculiar to the Amazon. As addressed in Chapter 1,

widespread migration to the region began at the same time as the inauguration of the industry. As a result, no longitudinal data on the health of residents exists prior to the initiation of oil exploration. High rates of mobility also have made it difficult for epidemiologists to establish degrees of proximity or duration of exposure, or to form ‘control’ groups of unexposed individuals for comparison. Lack of basic infrastructure, such as running water and plumbing,<sup>6</sup> means that confounding factors for certain diseases, such as bacteria in rivers that contribute to digestive distress, abound. A dearth of health services meant that when people fell ill they sought (and seek) health care in Quito or Guayaquil if possible, which means there is a limited local reporting of disease incidence. In addition, the *Aguinda* lawsuit and the state’s push for extraction has led to an explicit politicization of all investigations of contamination.<sup>7</sup>

There is limited epidemiological literature on exposure of communities to oil, in part because environmental exposures must be documented in real time, and in part because, for obvious reasons, studies of intentional, controlled exposures are not possible with human subjects. While the state and private companies are best equipped to track exposures and hazards, they have a tremendous financial disincentive to do so. Most scientific research on exposures has been carried out following spills; however, far less research exists on habitual, residential, or long-term exposures such as those of Lidia and her neighbors.

As Camilo suggested at the opening of this chapter, applying generic models of risk assessment to exposure in the Amazon means missing fundamental connections between people’s lives and toxins. Those who study toxicity must have knowledge about a place and the

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<sup>6</sup> The proportion of residents with access to those services has dramatically improved even from the 1990s to the present however, it remains a significant problem in rural areas.

<sup>7</sup> My intention here is not to draw a distinction between science and politics but indicate the heightened political and financial stakes attached to scientific investigations in the context of such a high-profile lawsuit.

daily routines of the people who live there – knowledge which comes from personal relationships between investigators and study participants. A pair of epidemiologists, San Sebastián and Hurtig, have produced most of the epidemiological work on health problems associated with oil development in the Amazon since the early 1990s. I highlight their work here, in particular one study that Chevron critiqued in part due to the popular epidemiology methods used to design the study and collect data. This critique, as well as the authors' subsequent response, illustrates the significance of epistemological commitments in determining toxic exposures and their bearing on life in the region.

*Yana Curi*, meaning *black gold* in Kichwa, is a report published in 1999 by San Sebastián and Córdoba. Employing popular, or community-based, epidemiological methods (San Sebastián and Hurtig 2005), the researchers worked in collaboration with the Frente de Defensa de la Amazonía (FDA) in order to “increase the limited knowledge that exists about the health effects caused by the contamination surrounding the oil wells” and to “answer the questions and concerns of the people of the Oriente about the effects that this contamination has on their health,” (San Sebastián and Córdoba 1999). The FDA wished to express in scientific terms what their constituents already knew: that there was a link between oil contamination and the health problems from which they and their families suffered. This study has since become one of the most frequently referenced, and most controversial health studies in the region.

The FDA wanted a scientific report that leaders could mobilize in official encounters with government and company representatives as part of their advocacy efforts. Lay knowledge and concerns about exposure informed the formulation of the research problem; however, the researchers and the FDA decided that traditional epidemiological methods would be best suited for the investigation. The authors describe the study as a way to transform lay knowledge into



‘another language’, which could be recognized by authorities such as companies, lawyers and government officials,” (San Sebastián and Hurtig 2005, 801). However, as noted by the authors, the FDA played no role in data collection or analysis.

The report outlined evidence of the effects of contamination on health and did a case study of the community of San Carlos, where concern had been raised after the local health clinic reported several cases of cancer (San Sebastián and Córdoba 1999, 7). In what later would become one of the most cited and controversial health claims in the region, the authors found elevated risk for cancer of the larynx, bile ducts, liver, stomach, melanoma, and leukemia in men and cervical cancer and lymphoma in women in San Carlos (San Sebastián and Córdoba 1999, 14). Today, activists and residents frequently reference that study to speak of the ‘cancer crisis’ in the region, despite the limited population of approximately 1000 individuals included in the study. The authors also found high concentrations of contamination in the water residents living near oil installations used for drinking and bathing, as well as self-reported skin mycosis, tiredness, itchy nose, sore throat, headache, red eyes, ear pain, diarrhea and gastritis among women living near oil fields (San Sebastián and Hurtig 2005, 803).

Chevron roundly critiqued the team’s work, in particular the San Carlos cancer cluster.<sup>8</sup> Chevron insisted there were problems with inferring causality from the studies and accused the authors of researcher bias due to the relationship between they had with affected communities, a relationship that made the study possible because they understood the concerns of the population (Hurtig and San Sebastián 2005, 14). After reviewing the *Yana Curi* study and other work by the

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<sup>8</sup> In one report entitled “Oil Contamination and Health Effects in the Ecuadorian Amazon Basin: A review of recent reports and publications” found at [https://www.texaco.com/ecuador/docs/report\\_sever\\_en.pdf](https://www.texaco.com/ecuador/docs/report_sever_en.pdf), the author reviews and critiques existing studies. The report is linked from Chevron’s website on the “History of Texaco and Chevron in Ecuador.”

authors, Sever, an expert for Chevron, insisted that “There is little or no evidence that would support a causal relationship between oil contamination and health effects” (Sever 2005, 2). He found even the suggestion of an association “highly questionable” given methodological problems with how cases and exposures were determined, as well as problems with bias and confounding variables. In particular, Chevron queried how the researchers determined population size, arguing that the cancer incidence rate is misleading given the conservative population estimates used in the study (Kelsh, Morimoto, and Lau 2009). Most important, the researchers’ motivations for undertaking the research were called into question:

The larger agenda of social activism with respect to lack of public health programs and medical services is potentially being used to argue, speciously, for attributing the poor health of members of marginalized and disenfranchised communities to oil contamination. Review of the documents related to health status and human rights in Ecuador in general suggests that the problems observed are unrelated to oil contamination. (Sever 2005, 2)

In an article entitled “Epidemiology vs epidemiology: the case of oil exploitation in the Amazon basin of Ecuador,” (2005) San Sebastián and Hurtig respond to the critiques, arguing that complex cause-effect relationships cannot be reduced to purely methodological issues. Assertions that an epidemiologist must be an “objective” and “independent” observer should not obscure broader questions of who is and is not exposed to contamination. It bears noting of course, that scientists working for Chevron are no more objective nor independent from the concerns at hand than those working with the plaintiffs. This dispute between San Sebastián and Hurtig and scientists working for Chevron, such as Kelsh, Morimoto and Lao (2009) encapsulates what is at stake in disputes over such commitments to objectivity in epidemiological work:

None of us live in a vacuum and epidemiology, as a science, is a social process, never the application of objective value-free rules. In this case, Texaco’s consultants ignored the history of environmental pollution and human rights violations that communities of

farmers and indigenous people have experienced. While focusing on specific chemicals and individual exposures, they also forgot to ask themselves where the exposures came from, why they have been produced and who benefited from them. The reductionist approach that the consultants took focusing just on a set of techniques and ignoring the broader issues of context, is unfortunate, leads to a lack of action and potentially transforms epidemiology into a tool of unfairness and oppression. The main issue for public health and the inhabitants of the Amazon basin of Ecuador is not whether some studies show or do not show causality but about the need for preventing disease and promoting health. Our research, together with qualitative and environmental information from the region, has indicated that those residents are in a public health emergency requiring immediate action. (Hurtig and San Sebastián 2005, 1172)

The authors argue that questions about why exposures occurred and who has benefited from them must lie at the heart of scientific assessments of exposure. It is an argument that epidemiology should reveal the complexity of toxicity rather than limit relationships of exposure to narrow questions of causality. Their statement holds epidemiologists accountable to the limits of their tools of assessment and calls for scientists to promote health in the places they work.

The *Yana Curi* report was part of a longer series of studies by the team throughout the northeastern Amazon. In one study that examined differences in overall and specific cancer incidence rates between those living in proximity to oil fields and those living in areas free from oil exploitation found that the relative risks of all cancers were significantly elevated for those living in exposed counties. In particular, stomach, rectum, skin melanoma, soft tissue and kidney cancers were elevated in men; cervical and lymph node cancer elevated for women; and hematopoietic cancers were high among children under the ages of 10 (Hurtig and San Sebastián 2002b). A study of the incidence of leukemia in minors under the age of 14 among groups living near oil fields and those who did not found the relative risks for leukemia elevated in children under the age of 4, as well as all other age cohorts. San Sebastián and Hurtig argue that the results suggest a strong association between leukemia incidence in children and oil operations, but state that the data are not sufficient to confirm a causal relationship (Hurtig and San

Sebastián 2004b). They have published numerous other studies in a similar vein (Hurtig and San Sebastián 2002a; Hurtig and San Sebastián 2003; Hurtig and San Sebastián 2004a).

Kelsh, Morimoto and Lao (2009) obtained results that contradicted nearly all of San Sebastián and Hurtig's findings. Citing problems with underreporting, misclassification of disease and exposure, methodological limitations, lack of other studies examining the health effects associated with oil production, and problems with data quality, interpretation of results, and study reproducibility, these authors found no elevated risk of cancer in oil producing areas of the Amazon. Kelsh *et al* claim that relative risk estimates were lower for most site-specific mortality data on cancer, and that mortality rates in Amazonian provinces were generally lower than those in the province of Pichincha (where Quito is located). The authors affirm the fundamentally unresolved nature of these questions: "These limitations have left the question of how oil production activities may have affected community health largely unanswered" (Kelsh, Morimoto, and Lau 2009).

The dispute over the relationship between oil production and harm is not restricted to opposing parties in the *Aguinda* case, or to health data alone. Independent researchers have also obtained contradictory, at times confusing, results regarding contamination. In a study by Bustamante and Jarrín (2005), the authors did not find oil production to be the principal factor correlated with differences in socioeconomic indicators between areas of oil extraction and other parts of the Amazon or the rest of the country. While they found a relationship between the precarity of infrastructure and access to services in oil-producing regions, they did not claim a statistical relationship between oil and massive poverty or ill-health, for instance (Bustamante and Jarrín 2005, 26).

These disputes are not over differing numbers. In some cases the very same data are used

to bolster opposing claims. The disputes hinge on distinctions made about the relevant field of inclusion for the studies: in other words, how far do relations of toxicity extend? What kinds of knowledge about daily life are relevant? In Chevron's rebuttal to Richard Cabrera, the independent court expert who produced the "Technical Summary Report" for the *Aguinda* case, Kelsh, McHugh, and Tomasi (2008) conclude that data on levels of oil-related chemicals in soils, sediments, and water submitted to the court do not demonstrate a health risk to local residents. Chevron's experts reached an entirely different conclusion from this data. Instead, they argue that health problems are a result of factors unrelated to oil:

An evaluation of available epidemiologic studies and Ecuadorian government health statistics demonstrates that most, if not all, of the health conditions of local residents that could be attributed to an environmental factor are not related to petroleum exposures, *per se*, but are more likely attributable to other factors relating to lack of adequate public health infrastructure, which encompasses poor sanitation, lack of potable water, and inadequate medical and health facilities, as well as widespread poverty. (Kelsh, McHugh, and Tomasi 2008, 8)

This argument relies on the bounding of the material reaches of oil production and its toxins. Chevron representatives have maintained throughout the lawsuit that while such toxins may exist, for instance inside the boundaries of a waste pit, they have not migrated to rivers. In this conception, toxicity is not relational; the production of oil is unconnected to the processes by which settlement unfolded and through which people drink unfiltered water from streams and rivers. A cut is made that stops at the wall of the pit or at the boundary of company property, as though industries did not change the places, economies, and daily practices in which they operate.

Tracking exposure hinges on experience living and working in the area. As a result, much of the research on exposure has been done in partnership with affected communities, something which industry critics argue compromises scientific integrity. Much of the scientific work in this

region has relied on collaboration with the plaintiffs or environmental activists; they are often the individuals most interested in documenting the impact of the industry. Such collaborations do involve explicit political commitments. For instance, the text *Ecuador ni es ni será ya un país amazonico: Inventario de impactos petroleros* (Maldonado and Narváez 2003), produced in conjunction with the Ecuadorian NGO Acción Ecológica, opened by stating the authors' intent to produce "an inventory that aims to make visible the abuses that the companies wish to hide" (3).

In the Maldonado and Narváez study, researchers interviewed 1,520 people living in 80 communities, and completed 342 visits to oil installations in Sucumbíos and Orellana. The study found that 60% of those surveyed lived in houses located less than 500 meters from contamination from wells. Of those, 42% of homes were located less than 50 meters from wells and stations, indicating that almost half of the inhabitants were exposed to high concentrations of toxic materials (Maldonado and Narváez 2003, 8). According to surveys and interviews, 82.4% of the population reported having been made sick by contamination, with 96% reporting problems with their skin, 75% respiratory problems, 64% digestive problems, and 42% eye problems (Maldonado and Narváez 2003, 9). 75% percent of those surveyed reported using contaminated water for drinking, cooking, and bathing, claiming they had no other source. Length of time living near oil operations raised the number of cancers in a population, doubling at 20 years and tripling after that.

Other researchers have undertaken related studies on the effects of the oil industry on the environment. A study by the Ecuadorian state oil company CEPE in 1987, (Corporación Estatal Petrolera Ecuatoriana 1987) found elevated levels of oil in rivers and streams near production facilities. It also noted the depletion of dissolved oxygen in waters, presenting problems for the health of aquatic ecosystems. An Environmental Impact Assessment by the Dirección General de

Medio Ambiente in 1989 found that crude oil had been routinely discharged into the surrounding forests and waterways (Dirección General de Medio Ambiente de Ecuador 1989; San Sebastián and Hurtig 2004). Such studies suggest that the Ecuadorian government has known and documented problems with contamination since the late 1980s.

These studies are one example of how epidemiologists have investigated the question of exposure in the Amazon. While environmental justice communities herald collaboration with affected communities as an important turn towards more inclusive form of knowledge production, for some corporate or company actors such methodologies indicate a weakening of the strength of knowledge claims because of the relation of the authors to their collaborators. San Sebastián and Hurtig's explicit recognition of the limits of epidemiology and their call for scientists to be accountable to the places they work comes with costs within the context of disputes over oil. Yet, as Lidia and other residents' accounts make clear, such partnerships are fundamental for understanding people's relations to toxins in a particular place, and why understanding exposure demands an analytic of justice.

### ***Moving between image and place***

Let's return to Camilo, with whom I opened this chapter. A biologist with an MA in GIS mapping, Camilo has decades of experience working in the Amazon. In the early 1990s, while living in the Cuyabeno, he partnered with Cristóbal Bonifaz and others in laying the groundwork for the initial *Aguinda* complaint. In the early years of the lawsuit, surveyed over 1,000 families living within the concession, going from family to family, ten families a day, in order to compile information on the effects of oil extraction on peoples' lives. Later, he worked for the Environmental and Social Reparation Fund of the Ecuadorian government.

We were reviewing aerial images of different wells, which had been taken over decades. There are thousands of images, some shot by the Geographic Military Institute (IGM) and others from smaller planes, of the hundreds of wells throughout the Amazon. By comparing images of the same well sites side by side, different features of the industrial landscape become visible: the outlines of platforms, pits, spills, rivers and streams, forest cover, and the growing roads and homes, crops, and schools of settlers. Camilo selected some of the images for a presentation for which he had labeled important features: pit; oil spill; well-head; school; river. These images don't demonstrate exposures *per se*, but they do draw relations through proximity. They establish the ways that industrial infrastructure are in connection, in space and time, to people's lives through roads, schools, and houses. While some features, such as pits and spills, 'disappear' over time and from one photo to the next, the images make it possible to trace these sites through other tools, such as sampling and observation, in order to make a case for the harm resulting from oil production.





*Figure 22 Aerial image of school, waste pit and well head.*

Reading the images chronologically allows a close view of the industry and the growth of a community over the years. Oil tankers pause on the winding roads; schools and houses appear a stone's throw from the scraped clear areas of a platform and the black stains of waste pits. From one image, the forest reduces. The repeated squares of settlers' crops emerge, checkering the land. Pits appear and disappear; as dirt and grass cover their perimeter, they fade into the surrounding scrub.

Camilo has labeled the images to aid the eye of an uninitiated viewer. The black shapes that might in a different situation or to a different eye appear to be ponds of water, are marked waste pits. The leaking plume from an otherwise nondescript square labeled "well head" takes on new meaning in this setting, a dark stain now understood as contamination and labeled "oil

spill”. Other shapes also are labeled, to point to the sweep of a river in the same frame, or the proximity of a school – and by extension, young, vulnerable bodies – to the black spot of a wellhead and pit.



*Figure 23 Comparative images of the Sacha 80 well between 1986 and 1990.*

Unlike some images of the past, there is no nostalgia to these photographs. The megapixels of their layers of meticulous detail and historical capture, as well as the sheer quantity of images lends solidity to their review. They are part of an archive of photographs that Camilo keeps on his computer, which are also kept as part of the state archive through the IGM and as part of the official *Aguinda* court record. Yet they are not self-evident. Without the red outline added to the pit, or the helpful finger of someone who has lived in the region and knows the sites, it would be difficult to see the changes over time, to know where pits had been: “But,” Camilo says, “if you go here with an auger and dig down, oil will come out.”





Figure 24 Comparative images of Southwest Shushufindi Station in 1976 at the very beginning of

*oil operations and 1986. Note the clearing of forest, construction of 3 new waste pits (labeled as 'holding ponds'), and the extension of the spill behind the well site.*

Drawing on both GPS technology and intimate knowledge of the area proved crucial for plaintiffs during the judicial inspections of the Aguinda lawsuit. Camilo explains:

This was one of the important things in the lawsuit because [ . . . ] the plaintiffs had access to this technology, so we could find and generate the coordinates and go with the judge and say 'We'll dig the hole right here'. It was funny because in the first few inspections, before we had presented any report, they did an inspection, and another and another. And Texaco still hadn't seen any of the reports because there was a 4 months delay to hand in the reports [to the court]. So, in the early inspections they didn't know what methods we were using.

So, I was there [in a judicial inspection], it was very funny, we said, "Judge, we want to take the sample right here!" And there is a relationship [between those working for the plaintiffs and] the lawyers from Texaco too, since you spend all day together. And in addition to this, one of them was the father of a friend of mine from high school, so there's a relationship of sorts. And they would say 'How do you know that there is oil there?!' and I would say 'We consulted with our shamans [laughing]; it's just the magic of the jungle! So there - right there - we'll dig our hole [to take the soil sample with the auger].' And at first they didn't believe us – but then pure petroleum [came out]. Pure petroleum.

The funniest one was in the station at Sacha. In Sacha station, right where the oil camps are [inside the perimeter of the station area]. I had seen a pit on the aerial photos, and now there is a parking lot on top of the pit. The parking lot of PetroEcuador. So, we asked them to dig the hole right there. And they said, 'Ok, now your shamans have gone crazy!' And I said, 'Well, we'll see, the shamans are never wrong!' So we dug the hole – but [it was] all rock, all gravel. One meter [down], Two meters, nothing. Then at three meters, all oil. Right there in the middle of the oil camp. Texaco didn't even know where the pits were, they didn't have a record of anything – how many pits there were, or where they were.

Moving between images and physical sites provided a way to find and demonstrate the presence of old toxins hidden under meters of soil. It let the plaintiffs show, via samples, something that people who lived in the area insisted – that there had been a spill over here 20 years ago, or a pit here that the company or state later covered over. It allowed the plaintiffs to access contamination that was not immediately visible but whose traces were still present, such as contamination covered over by soil, parking lots, or crops. Also visible are the columns of smoke

Lidia and many other *campesinos* described in their accounts of earlier decades. Here they appear in photographs at a precise moment in time and space, a specificity impossible to obtain from an interview. Depending on the angle of the plane flying overhead, the density of the smoke is palpable, casting a long shadow over the land below. These images were crucial to making industrial practices that had occurred decades ago traceable; in the process harm is given shape through the work of assembling of verbal accounts, soil samples, aerial images together that it did not have before. Something as nebulous as a cloud of smoke or a chemical plume in the ground is given a specific form through these interventions.

The images illustrate the importance of understanding exposure as something that changes over time. They capture forms of exposure to toxic chemicals different in type and degree than those that I witnessed during fieldwork, for instance. Modifications have occurred as the industry has developed, especially after passage of the comprehensive environmental regulations in 2001. These have changed the nature of exposure.

Yet, as with any technique, the interpretation of images is no less disputed than the soil samples linked with their coordinates (see Chapter 3). Each technique has its limits. The independent expert Richard Cabrera used this method of locating pits in the compilation of his much debated, and ultimately discarded, Technical Summary Report (2008) to the court in the *Aguinda* proceedings. Consultants for Chevron generated their own report, “Rebuttal of the Methodology Used by Mr. Cabrera to Determine the Number and Size of Pits in the Petroecuador-Texaco Concession,” (Di Paolo and Hall 2008).

In this rebuttal, Di Paolo and Hall argue that aerial photography can be used to make preliminary assessments of oil field operations when experienced individuals do the interpretation by “ground-truthing,” verifying features seen on images. The authors cite

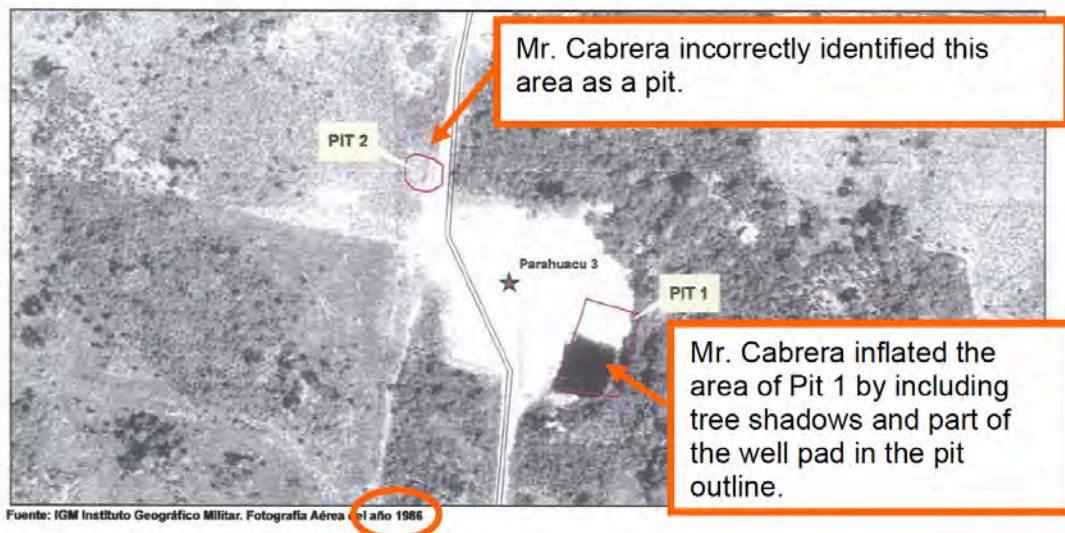
inconsistencies, such as a lack of photographic evidence to match claims for 249 of the 335 sites evaluated in the Technical Summary Report, as well as problems with misidentification and incorrect outlining of pit perimeters. Interpreting aerial images is difficult due to the effects of shadowing, the distribution and size of vegetation, soil moisture differences, and the use of variable quality, low-resolution, black and white photography. These are some of the methodological constraints of this technique, all of which, they argue, contributed to the errors they detail in the report (Di Paolo and Hall 2008, 3).

These methodological issues and the potential for error carried weight in this case. The images were used in *Aguinda* proceedings to determine total number of pits within the concession, and by extension, to calculate the total contaminated surface area and costs for remediation. According to the Di Paolo and Hall rebuttal, such errors prove that Cabrera's conclusions regarding the nature and extent of damages were at best faulty, and, at worst, duplicitous: "Since Mr. Cabrera ignored even his own field observations, his alleged pit count is inaccurate, inflated, and without merit for calculating remediation cost estimates. Failure to correct interpretation errors at many sites, even after ground-truthing, would indicate either a gross oversight or possible intent to falsify the number and size of pits present at these sites," (Di Paolo and Hall 2008, 3–4).



**Figure 4.1**

Mr. Cabrera's aerial photo of well site Parahuacu 3, where he misidentified vegetation as Pit 2. Mr. Cabrera took two samples from Pit 2, but discarded them since they were free of hydrocarbons. However, he did not use this information to correct the number of pits at this site. The area of Pit 1 is exaggerated by the inclusion of tree shadows on the east (right) side of the pit and part of the well pad causing it to be drawn as a large rectangle instead of its obvious smaller square shape. This is a 1985 photo, not 1986 as labeled by Mr. Cabrera.



*Figure 25 “Figure 4.1; Mistake #4: Claiming that dark areas are pits even after field observations (ground-truthing) prove that no such pits exist” (Di Paolo and Hall 2008, 17). Here the interpretations of the images by Cabrera are re-interpreted by Di Paolo and Hall in their report.*

My purpose in describing this dispute is not to take sides in a debate over the accuracy of aerial images. The Technical Summary Report was ultimately removed from consideration following allegations that the expert was not independent, and had been inappropriately collaborating with Stratus Consulting (Barrett 2014). Rather, Chevron’s rebuttal illustrates some of the limitations of pit identification via aerial photographs, just like other techniques for determining contamination and tracing the relations that give rise to exposures. At the same time, the images allowed the plaintiffs to identify and inspect pits during the Judicial Inspections, to document the burning of pits on specific sites, and to corroborate plaintiffs claims. Exposures emerge through the relations forged by digging into asphalt with an auger, interpreting

connections from a series of historic images, and the stories that residents tell of how contamination was experienced in the flesh.

Each of the techniques I have addressed in this chapter – interviews and life histories; epidemiological studies; the use of aerial images – are material engagements that draw connections between toxins, lives, and places. No technique is a self-evident means of evaluating contamination, and no single technique can capture the complexity of toxic exposures. As Haraway (1988) argued, objectivity, that “no-nonsense commitment to faithful accounts of a ‘real’ world,” can only be sought through partial perspectives that are critically attentive to the positioning of all knowledge claims.

The lawsuit and scientific endeavors to understand contamination seek to parse precise distinctions between chemicals and their effects, between one oil company and another and between bodies and environments. Toxins are an affront to the distinctions upon which arguments are built about what does and does not constitute harm during the extraction of oil. Particular interventions, such as epidemiological studies or the recording of life histories, make exposure real in different ways, yet each is differently constrained in its engagement with the world. As Tuana writes, “If we are to fully understand the complex practices of knowledge production and the variety of factors that account for why something is known, we must also understand the practices that account for not knowing, that is, for our lack of knowledge about a phenomenon” (Tuana 2008, 204).

To show why the degree of toxic exposure in the Amazon remains unsettled, I have highlighted some of the many challenges. These include: the methodological restrictions common to all environmental exposures research; the specific types of exposures in the course of



daily life; disputes in scholarship and over techniques using aerial photos to identify contaminated sites. Epistemic responsibility in this case requires understanding how history and inequality are woven into the very fabric of exposure, but often ignored or rationalized in official determinations. Given the tangled relations of toxicity, we must be more attentive to the epistemic limits of tools for calculating the harm from oil. Yet, as I will continue to argue through this text, acknowledging the limits of what we know about how toxins traverse boundaries should not preclude political, legal, or regulatory action to prevent harm. Epistemic analysis of toxic relations cannot be separated from ethical analysis (Code 1991) of how toxin burdens are unequally borne by some and not others. We are each transformed by the toxic relations that both sustain us and place us at risk.

## EVIDENCE/EVIDENT IN THE AGUINDA V. TEXACO LAWSUIT

***“Facts do not exist. Facts are created.”***

In 2009, a documentary entitled CRUDE was released (Berlinger 2009) that chronicled two years of the legal proceedings and activist struggles surrounding the *Aguinda* lawsuit. The documentary team had worked closely with the plaintiff attorneys in the making of the film. Noting differences in the version shown in Quito and the final release, Chevron subpoenaed the outtakes of the documentary, arguing that the extra footage would demonstrate illicit activity on the part of the plaintiff lawyers and inappropriate collaboration between the plaintiffs and scientific experts. In one clip, plaintiff lawyer Steven Donziger is seen stating that, “Facts do not exist. Facts are created.” Chevron brandished the clip as proof that the plaintiffs, as the company had long maintained, did not traffic in reality. This, they argued, confirmed their contention all along: *the plaintiff’s facts were made up.*

Science and law purportedly adjudicate matters of fact, establishing truth and, in the case of law, ascertaining wrongdoing. Facts are supposed to speak for themselves: collect enough evidence and the truth will become apparent. *Aguinda* was expected to determine if Texaco responsible for harm to the environment and to the people who lived in the Ecuadorian Amazon during its 20 years of operations. Yet, two decades after the lawsuit was initiated in New York and subsequently transferred to Lago Agrio, the issues of who to hold responsible for contamination, or how to document and measure contamination remain fiercely contested despite the proliferation of facts.

The evidentiary record of eighteen years of legal proceedings is prodigious. In light of an extensive court record, the *Sentencia* [judgment] issued by Judge Nicolas Zambrano in 2011 at the conclusion of the case, and the subsequent 2013 RICO lawsuit<sup>1</sup> brought against plaintiff attorney Steven Donziger by Chevron which disputed the validity of the entire legal process in Ecuador, a comprehensive review of the evidence submitted in the case is beyond the scope of this chapter. Instead, I explore disputes over sampling procedures in the Judicial Inspections in order to discuss how legal evidence of harm is made and used in efforts to establish truth and accord responsibility.

Along the way, I tell a story about some of the contingencies involved in building this evidentiary assemblage. By contingencies, I mean that knowledge is produced through relations with other human and non-human actors (that can fail or surprise in a variety of ways) that form social-material engagements that give the world specific material form (Barad 2007, 91). Attention to contingencies – to relationships, technicalities, and unknowns –emphasizes the positionality, coordination, and the fragility of such engagements. This is one account of how the presence of contamination was established, how samples and historical documents were enrolled as evidence, and how the 2011 *Sentencia* drew distinct objects together solidify harm

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<sup>1</sup> Despite the landmark ruling in the plaintiff's favor, the work of enforcing the judgment has been far from easy. Texaco no longer has any assets in Ecuador, and the judgment can only be enforced in countries where the company currently operates. Additionally, allegations of fraud and wrongdoing by both parties have plagued the 20-year legal process. Following the 2011 sentence, Chevron has continued to use what activists have described as "scorched earth tactics," including suing the US-based plaintiff lawyer Steven Donziger in New York under the Racketeer Influenced and Corrupt Organizations Act (RICO) for \$32.3 million in legal fees (Barrett 2014). While the RICO case could not contest the sovereignty of the Ecuadorian judicial system, Judge Kaplan concluded that the *Aguinda* ruling had been arrived at through a fraudulent legal process and was "illegitimate and unenforceable" ("Chevron Corporation v. Steven Donziger, et Al., No. 11-0691" 2014). Donziger has appealed, arguing that Judge Kaplan overstepped the legal bounds of the RICO statute. Regardless, the 2013 RICO decision significantly complicated the process of executing the *Aguinda* sentence for the plaintiffs.

and decide responsibility. Considerable labor is required for a sample of soil or water to become evidence. But when assembled properly and with the right associates, samples can be induced to speak to issues that are not immediately present: the level of contamination in a region; differences in corporate practices between the United States and Ecuador; the delivery of justice; the nature of harm in this particular place.

Many of the plaintiffs and their supporters imagined that this lawsuit, and by extension the scientific and legal confirmation of contamination, would be a means to right historic injustices in the Amazon. So far this has not happened. Contamination and the effects of oil extraction on the environment and human bodies remains a disputed legal, scientific, and political matter. It also continues to be a visceral, undeniable concern for many who live in the region. Legal technicalities and allegations of fraud, wrongdoing, or insufficient evidence are at odds with the obvious impact of oil. For the individuals with whom I spent time, there was no doubt that Texaco's oil operations had caused environmental and personal harm: it was evident.

This contrast points to an unresolved problem in this case and disputes over harm more broadly: the pronouncement of the *Sentencia* and subsequent challenges have not resolved the friction between the obviousness of contamination for those who live with it and contradictory scientific evidence in *Aguinda*. Evidence is supposed to be compelling. Yet simply because an object is admitted as legal evidence does not mean it is persuasive; likewise, because something is evident to an observer does not mean that it may act as evidence in an official forum. The expectation that evidence should provide resolution paradoxically augments doubt when an absolute answer cannot be provided.

What might seem as esoteric academic claim that all facts, and by extension, all knowledge claims – including the evidence in this case – are produced through contingent

associations runs the risk of being interpreted to mean that claims are merely ‘fabricated.’ Yet, destabilizing the idea of the pure scientific sample found in nature as an evidentiary form, allows us to recognize the need for a broader appreciation of what might constitute evidence of harm from oil production. The presence of contamination as already evident places demands on us. May this chapter speak to the pressing need for remediation and restoration in the Amazon regardless of the outcome of this protracted legal process.

### ***Evidence / Evident***

Evidence is a multivalent term. Evidence operates across several registers, ranging from the graphic, to the visual, to the experiential. Furthermore, what counts as evidence depends on genre: scientific, medical, and legal evidence mobilizes distinct objects and expectations. Yet, even within a single field, ‘evidence’ often serves as a catch-all for a variety of material and rhetorical forms that must be drawn together to support a particular conclusion; consider the submission of expert testimony, documents, and laboratory results in a single court case, or the use of laboratory results, images of pathology, and symptoms reported by the patient in a medical diagnosis. There is a broad body of literature in the history and philosophy of science that demonstrates the historical and cultural specificity of what counts as evidence. Such literature on historical shifts in the production of knowledge situates *Aguinda* within broader concerns involving the making of facts and reliable accounts of the world.

Historical shifts in representational technologies show how changing epistemic virtues of truth, objectivity, and judgment have permeated scientific practices (Daston and Galison 2010). Such representational modalities shaped possibilities for knowledge and reflected available means of organizing reality. Changes in what is meant by the fact as a unit of knowledge are

related to shifts in the nature of evidence. In particular, the relationship between the concept of evidence and the kind of person judged capable of making truth claims changed, along with what counted as knowledge (Shapin and Schaffer 1989; Haraway 1997). Schaffer recounts Foucault's argument that the relationship between the person and evidence shifted dramatically in the classical age. While the authority of a statement was previously thought to depend on its author, matters of fact came to be understood as divorced from their production (Schaffer 1992, 327). At different moments, the authority of the scientist carried more weight than the object of evidence itself (Hacking 2006), whereas at present facts supposedly speak for themselves.

Because a fact can be enrolled to support a variety of potential claims, its meaning is unstable. "[Facts] are robust in their existence and opaque in their meaning. Only when enlisted in the service of a claim or a conjecture do they become evidence, or facts with significance," (Daston 1994, 243). This situation bears on *Aguinda*: a commonsense understanding holds that neutral facts exist and then various actors put them to political use; what makes a fact objective is its purported independence from interpretation. In particular, numbers, which constitute a form of representation, are often held to be the pre-interpretive foundation of solid knowledge claims (Poovey 1998).<sup>2</sup> Such ideological distinctions between fact and value, or objective and subjective, are used to discount knowledge that is perceived to rely on interpretation or bodily perception.

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<sup>2</sup> Facts have not always been constituted in this manner. Daston contends that the notion that facts are detached from theory arose following the insistence of philosophers like Bacon that universals did not emerge on their own but had to be constructed through careful observations of particulars (Daston 1991; Poovey 1998, 8). In a similar vein, Dear argues that it was through experimentation in the same period that particular events came to have new significance. A singular experience could not be evident, but it could provide evidence (Dear 2009; Poovey 1998). Tracing practices of double entry bookkeeping and the emergence of statistics from the sixteenth to nineteenth centuries, Poovey (1998) claims that interpretation gradually became separated from description. In the process, the 'modern fact' was made, a unit that could both describe a discrete particular and contribute to broader knowledge claims.

Several propositions derived from Science and Technology Studies (Barad 2007; Mol 2002; Haraway 1988; Latour 2004) inform my treatment of evidence. The first is that evidence is not ‘collected,’ but rather actively produced. Soil that smells of petroleum to the human nose is not scientific or legal evidence until it has been sampled according to specific procedures, submitted to a series of laboratory protocols, evaluated, compared to other samples, and interpreted for the court by an appropriate expert. By the end of this chain of transformations, the initially telling feature of that soil – its smell is no longer relevant. Making evidence requires a great deal of coordinated effort that extends far beyond ‘collection’ of naturally existing objects.

Yet at the same time, for the farmer whose crops grow in that soil the smell *is* evidence – in the sense that it is *evident* – of contamination on his or her land. Following Schaffer, this sense of the evident refers to the “rhetorical sense of vividness, a gesture which refers to the immediate appeal of the fact itself” (Schaffer 1992, 328). The blackness of crude or sensations of nausea convince through their viscosity. Bodies and their senses are instruments of perception in this latter sense of evidence.<sup>3</sup> The production of legal and scientific evidence exists in tension with sensorial obviousness when someone offers you well water tinged with the smell of oil and asks, *Would you drink this?*

Second, forms of evidence never exist in isolation, but rather must be enrolled in larger assemblages in order to speak to a particular claim. This requires that distinct objects, standards, and scales be drawn into the same frame. A central focus in what follows are the numerous techniques, co-ordinations, manipulations, values, investments, and relationships necessary for a soil sample to become evidence. I emphasize the ways that evidence in *Aguinda* was produced through associations that pulled expert testimony, historical documents, maps, laboratory

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<sup>3</sup> For more on the role of bodies in the production of evidence, see Chapter 5.

samples, and aerial images into relation with one another through a great deal of human labor. This work of coordination and exclusion, interpretation and extrapolation, enables movement from the particular to the general. In addition, compensations for what is not known are essential to the making of evidentiary claims. Yet, as will become clear, evidence does not require stabilization to speak to questions about contamination, responsibility, or justice.

In what follows, I examine how legal evidence is produced through practices of ‘representative sampling’ and discuss the court’s decision to resolve problems such sampling raised by juxtaposing it with other kinds of evidence. My concerns diverge from those of the parties involved, or from those of a lawyer, a scientist, or an activist. I do not evaluate whether particular claims are true in a normative sense, or probe allegations of fraud or wrongdoing. At the same time highlighting the role of contingencies in the making of evidence does not contest the facts the case produced, or undermine calls for corporate and state actors to assume responsibility for contamination. Rather, following Latour (2007), I contend that that all facts gain their durability through such varied and various associations. Indeed, the open, contingent nature of evidence is reason to give greater weight to matters that are evident but erased through scientific and legal processes.



## *Judicial Inspections in Aguinda: In search of the Representative Sample*



Figure 26 The Supreme Court of Nueva Loja, Sucumbíos, Ecuador, Photo credit: Mitch Anderson 2012

On 21 October 2003, the *Aguinda* complaint was filed in the Superior Court of Justice in Lago Agrio. Marching behind a banner stretching the width of the street that read *Justicia Ya! Texaco Basta!* (Justice Now! Enough with Texaco!) Indigenous and settler leaders from the plaintiffs raised their fists and chanted as they made their way to the courthouse. Supporters behind them held homemade signs on sticks, carrying messages from affected communities, calling for action, and admonishing Texaco.<sup>4</sup> At the courthouse, balconies were lined with people who watched as the plaintiffs held up a banner that read *Amazonía libre de ChevronToxico* (The Amazon free of ChevronToxico) as Ecuadorian Special Forces stood by.

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<sup>4</sup> Images capturing this day can be found in *Crude Reflections* (2008) by Lou Dematteis and Kayana Szymczak.

Inside, Judge Alberto Guerra opened by addressing the courtroom. Behind him, a mural of an Amazonian Lady Justice filled the wall, her right hand brandishing a double-edged sword, while her left sustained the scales of evidence. Knee-deep in a river, she gazes out with a subtle smile, the bucolic jungle backdrop diminished by her towering presence presiding over the courtroom. Unlike other representations of the goddess, no blindfold covers her eyes.<sup>5</sup> Instead, her gaze meets those of onlookers as a fiery sun sets behind her.

Located on Avenida Quito, the road that connects Lago Agrio to Ecuador's capital, the courthouse is less than a mile from the state oil camp that Texaco originally built in the 1960s in Cofán territory. The courthouse shares the four-story building with a variety of shops. Its front covered in reflective windows obscured by low hanging electrical wires, it presides over a mess of motorcycles, vendors selling roasted plantain, honking horns, and *vallenato* music. After a stalled beginning in New York, *Aguinda v. Texaco* returned to the site of Texaco's operations in Ecuador. The plan was as follows: There was to be no jury in this case, and no verbal testimony. The case began with a presentation of statements by both sides, and then proceeded to a phase called Judicial Inspections. During Judicial Inspections, the courtroom became mobile: the Judge, lawyers, technical experts, and administrative staff traveled to 122 former Texaco sites (wells, production facilities, spill sites) across the Concession.<sup>6 7</sup> Both parties nominated sites to be inspected in front of the judge. In the inspection, technicians for both sides would take

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<sup>5</sup> Lady Justice is often depicted with a blindfold in order to represent her objectivity.

<sup>6</sup> Ultimately only 54 sites were inspected out of the 122 because the process was taking too long and the plaintiffs petitioned the Judge to conclude the inspections and move to an appraisal by an independent expert. The resulting "Technical Summary Report" (2008) by Engineer Richard Cabrera Vega t was subsequently thrown out after Chevron alleged inappropriate collaborations between Cabrera and the plaintiff team.

<sup>7</sup> The Concession refers to the area operated by the consortium of Texaco and the Ecuadorian State between 1972 and 1992.

samples of soil and water, which each party later analyzed. Judicial Inspections constituted most of the fact-finding portion of the trial. Once concluded, a panel of court-appointed experts reviewed the results both parties submitted for the Judge to consider.

This at least was the intended design. The actual proceedings were far more convoluted. Both sides contested nearly every step of the process. It is difficult to find any account of the events of the subsequent 10 years that is not disputed by a range of actors affiliated with either the plaintiffs or the defendant. In the process, however, an abundance of legal evidence was produced.

Lago Agrio #15: 4 May 2012, mid morning.

On the road leading from the center of Lago Agrio to the Aguarico River, we pull off to the right into a deserted platform. The well lies in the middle, with a large cleared area just beyond. Cut out of an incline, the area has been excavated, leaving a wall of red mud that forms the far boundary of the open space. The entire cleared area was previously a spill alongside a waste pit. It has since been remediated (Pit “2B” on Annex E; page 37). The exposed walls of the pit are the terracotta red of Amazonian soils, layered with fill that has been brought in. I am with Donald, a local activist who works with an activist group associated with the plaintiffs called the Frente de Defensa de la Amazonía, two photographers from the United States, and a small crew of assistants who are here to document the persistence of contamination from Texaco operations, all working in affiliation with the plaintiffs. We cross the cleared area to the far bank, shuffling through inches of standing water. Here and there a glint of oil drifts on the water’s surface.

Standing beneath the bank, approximately 5 meters above us, a black stain slinks down the wall. Donald kicks his boots into the mud to scale his way up the eroding wall. Reaching the

spot, he digs his shovel into the bank where the stain is seeping. With each shovel of caked orange earth, more black emerges. Donald narrates for the group below as he shovels. *The exposed walls have been washed by the rain, but the soil underneath hasn't.* PetroEcuador dug out this pit during remediation work a few years prior, but the project failed to encompass the entirety of the contaminated soil from the pit and leaching continues. Without an impermeable lining, the oil migrates – centimeter by centimeter – breaching the boundaries where the pit used to lie.



*Figure 26 Donald and photographer examining part of the wall of the waste pit. Photo by author.*

From the bottom of what used to be a waste pit filled with several meters of crude oil, production waters, and industrial byproducts, I look up at the walls of stratified mud, clay and oil. As though we were standing in the middle of an archeological dig, the horizons of soil above us mark the history of the industrial operations. Donald holds out a caked black chunk for the group's inspection. Donald's presentation of this sample, documented and indelibly framed by GPS coordinates, and accompanied by his narration, interpolates the object as a form of

evidence. For all of its particularity – this well site, this pit, this shovelful – the oil in the soil is mobilized as evidence.

Some six years earlier, this site featured in the Judicial Inspections of the *Aguinda* lawsuit. At 8:30 AM on 16 March 2006, Dr. Germán Yáñez Ruiz, the President of the Superior Court of Justice of Nueva Loja, his secretary Liliana Suárez, plaintiff lawyers Pablo Fajardo and Julio Prieto, and defendant lawyers Adolfo Callejas Ribadeneira and Alberto Racines gathered on this site. Part of the *El Progreso* (Progress) neighborhood of the Nueva Loja Parish, it lies on the outskirts of Lago Agrio.

Drilled in 1970 by Texaco, production of the well was subsequently initiated in May 1972 following the completion of the SOTE. Texaco closed the well 16 years later, in March 1988. Two years after that, PetroAmazonas took over the site. Over the course of its lifetime, the well's official record reports a total of 1,223,284 barrels of oil and approximately 300,000 barrels of production waters. What this means is that for every 4 barrels of oil extracted on this site, 1 barrel of water waste was also produced.<sup>8</sup>

Transcripts of the Judicial Inspections form a substantial portion of the court record. The transcriptions are full of cumbersome, tedious arguments between the lawyers, often repeated at multiple sites. Pages are crowded with documentation: crooked photocopies of the passports of technical experts, historic documents from the state or Petroecuador's record of operations, hazy photos of sites at the time of Texaco operations, and aerial images from the Geographic Military

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<sup>8</sup> A ratio of 4:1 is low, with other fields in the Amazon producing closer to 1:10, or 1 barrels of oil for every 10 barrel of production waters. The ability to count oil produced with such precision – 1,223,284 barrels – contrasts with the fuzzy estimate of water waste– 300,000 barrels. Given that production waters were routinely dumped into waste pits such as this one or drained directly into surrounding streams, there are obvious disincentives to reporting exact quantities. Therefore, one must question the accuracy of these numbers, which the company provided. Regardless, they form part of the official court record.

Institute. As was typical of the Judicial Inspections, the visit to Lago Agrio #15 opened with an inspection of the site and verbal observations by the President of the Court.



*Figure 27 Comparative images of Lago Agrio 15. Left: Image included in Judicial Inspections report of the drainage area on the corner of the platform of the Lago Agrio 15 well, taken in 2006 (pg 59 of cuerpo, pp. 101107). Right: Image by author of partially remediated waste pit on same site, taken in May 2012. Photo by author.*

Judicial Inspections had been occurring for almost 2 years at this point, ever since their initiation in 2004. Described as more ‘theatre’ (Tavares 2011) or ‘circus’ (Barrett 2014) than legal proceeding, the Judicial Inspections were attended by media, food vendors, environmental activists, security forces, and Chevron supporters, in addition to lawyers, technical teams, and the judge and his assistant. In early inspections, plaintiff technicians donned white Hazmat suits complete with facemasks to take soil cores and samples. The jungle heat made wearing such suits untenable and they were later abandoned. Arguments by the lawyers went on at length, making for long days beneath the equatorial sun. Although there was no verbal testimony in the lawsuit, when residents were present for inspections on their land, they too were questioned and their comments are included in the court proceedings.

As the court record opens for this site, the attorneys were engaged in a dispute over the appropriate way to take samples. At each site, the well platform, waste pits, and surrounding fields, streams, and forest all figure into the site's industrial zone. Given the simultaneous growth of oil development and colonization, no clear distinction exists between industrial, residential, and nature. As already noted, on many sites farmers built homes adjacent to well platforms, or on top of covered-over waste pits. Such sites were already level and clear, and thus made building significantly easier.

The area to be inspected was established through an examination of the site and reliance on prior knowledge of operations, including where waste pits had been located or spills had occurred. By selecting and sampling locations named by both parties, the Judicial Inspections aimed to understand oil's impact upon the Concession at large. The Concession size, 1,228,857 acres,<sup>9</sup> larger than the state of Rhode Island, presented a significant challenge to those seeking to know what had happened within it. Sampling involved extrapolation between the presence of hydrocarbons at particular sites and the total area to characterize the impact of Texaco operations over 20 years.

To make sense of disputes over the sampling process, I present proceedings from the inspection of this site, which addresses the problem of representation. At stake are the ways that samples are made representative of a site, as well as the relationship between these samples and the entire Concession.<sup>10</sup> I selected this particular site because Judge Zambrano excerpted part of these proceedings in his *Sentencia* (Zambrano Lozada 2011, 103). We can imagine the group of lawyers and the judge standing on the well site, likely with a small white tent erected nearby for

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<sup>9</sup> 497,301 hectares = 1,228,857 acres

<sup>10</sup> The technicalities are consequential. For those interested, the entire proceeding of this inspection is found on pages 101,127-128 of the Court Record.

shade with a collection of augers, shovels, plastic bags, and other implements for soil core sampling. Supporters of each party, onlookers, and press would have formed an audience, listening as the lawyers made their cases to Judge Yanez.

Pablo Fajardo (plaintiff attorney):

It has been the practice during judicial proceedings on the part of the defendant and its' technicians, to take samples out of context, outside of the pit – with what objective? To say that there is no contamination. Logically, if I take a sample from the top of that hill, no evidence of contamination will ever be found. The sample should be taken from the site where the pits are so that it can be known if evidence of hydrocarbons currently exists. The compound samples – what do they do? Take perhaps a sample in the pit site and two other samples out of the pit, and then in the homogenization of the samples, at the end these types of evidence are diluted or considerably diminished. These are small tricks in the technical part that are being implemented in order to detract, diminish, and make it appear before the court that contaminating elements do not exist, when this is not true Mr. President.

Adolfo Callejas (defendant attorney):

Starting with the last item that the lawyer Fajardo indicated, what had been solicited was a representative sample of the site, and the site is composed of a considerable area, and this area should be represented in the sample. As the name indicates, the sample is indicative of what is there. So this is not a trick. It is a system. First, it is in the plans for sampling and analysis that both parties approved, and second, it is used daily in our country and everywhere in the world because it is a scientific way to do it. The other is just a fishing expedition for what they call here, incorrectly, contamination, and is the mere presence of hydrocarbon residue. In regards to the way the technical experts [] do their sampling work, I reject the statements that they are a trick before the Court. It is the appropriate way to do it and what is sought with its execution is precisely to demonstrate if it is true that which is said so lightly, that the petroleum has migrated, that this petroleum has moved, that these materials are all over the area, converting this in an environmental disaster zone, that has no comparison in the world, according to what is said with great ease of the tongue, but without a single test, because up until now it has not been possible to produce a demonstration throughout these Judicial Inspections that this is the truth.

For the plaintiffs, a representative sample would be a sample taken from locations where one would expect to find contamination, such as downhill from a pit or spill site. If found, the presence of hydrocarbons would indicate that products from oil exploitation had migrated, and,



by extension, contaminated the environment surrounding the pit. This sample would thus be representative of the contamination present at the site. For the defendant such a sample would not be representative because it would be akin to cherry-picking data in order to achieve a desired result. Instead, Callejas argues that representation is achieved through a “compound” sample, in which samples from different locations on the same site (or the same pit) are mixed together in order to get a result that speaks to the area as a whole. A representative sample here is not one that reflects the most contaminated spot on the site, but rather one that characterizes the entire site – from the spot uphill from the pit, where there could logically be no migration of toxic compounds, to the area downstream. Fajardo argues that such “homogenization” is a ploy to obscure the presence of contamination by diminishing the overall levels of hydrocarbons measured.

At stake in these disputes over testing protocol is the truth of the individual data point. For the defendant, particulars are only meaningful in their aggregation. Thus, a particular sample’s ability to demonstrate contamination is tightly linked to what each party portends prior to initiating testing, and to both sides’ knowledge of the industry or the place in order to anticipate contamination. Interpretation of the physical environment and what certain results might mean is built into the very design of sampling. The accumulation of facts-as-samples is a political process from its start.

Such disputes were not limited to Aguarico 15. In reviewing the court record, debates about sampling procedure occurred across the inspected sites. In the Judicial Inspection at the Cononaco 6 well, for example, Callejas called the selection of sites by the plaintiffs based on knowledge that they would likely produce results indicating contamination “a farce.” Callejas addresses the judge:

It is called obtaining a representative and compound sample. Otherwise, what is done by the technicians of the acting party, is called fishing. They throw a hook and see where there is a piece of crude, and they make that out to be representative of the entire area. This is deceit, Mr. President, this is a lie, this is a farce. In all practice of sampling one tries to get a sample that represents the entire site, in its surface, in its width, in its length, in its depth, lawyer Pablo Fajardo. That is why representativeness is done, the homogenization of the samples is not to trick anybody, because if you do what your technicians do, that is, analyze this piece of dark material that you brought with you today, that is not representative of the site. (Quoting Callejas, Sentence 103-104, Cononaco 6 Inspection)

In industrial areas such as this well site, contamination is not equally distributed. Someone familiar with the industry could predict which areas would likely be more contaminated. By contrast, someone familiar with a particular site – as the plaintiffs often were, since they were in touch with the property owners and farmers who lived near the wells – could point to areas where past spills had occurred, or where overgrown waste pits lay. The argument that to test where one would expect to find crude – as though on a ‘fishing expedition’ – is misleading in the sense that it presumes that blind testing of the site or standard testing (i.e. testing the same set of points on every site) would be more representative. Neither the testing procedure advocated by the plaintiff nor by the defendant was “site blind” or pre-interpretive; both employed not only prior knowledge of the industry but also political commitments to decide where to sample. The defendant’s critique of the plaintiffs thus holds true for their own sampling procedure as well; to include sites known not to be contaminated and then insist that these sites speak for the Concession is similarly fraught.

Nature does not speak for itself. Complex transformations must be made in order to turn sites for sampling at a well into soil that can index a state of affairs. In the process, telling features of those sites are actively erased – such as the smell of the soil or a farmer’s memory of a spill that occurred 10 years before. Such movements between the site, the sample, and

representative evidence show how values reside in the facts themselves (Mol 2002). Allegations by the attorneys of trickery and fishing expeditions allude to the high stakes of the technicalities: these technicalities include where samples are taken, how many samples are taken, and the processes by which they are analyzed and evaluated. The details of such technicalities are not marginalia in this story. Following Mol, the “technicalities themselves, in their most intimate details, are technically underdetermined. They depend on social matters: practicalities, contingencies, power plays, traditions” (2002, 171). The procedure for collecting samples profoundly affects the resulting picture of the site and whether or not it is deemed contaminated.

A tremendous number of samples were taken over the course of the lawsuit. Each was tested for Total Petroleum Hydrocarbons (TPH), BTEX (benzene, toluene, xylene), polycyclic aromatic hydrocarbons (PAH), and heavy metals such as mercury, cadmium, lead, zinc, chromium 6, and barium. The consequences of the disputes over sampling procedures (both in quantity and method for sampling) are manifest in the different results they yielded. Chevron experts submitted a total of 50,939 results derived from 2371 samples. Plaintiff experts submitted 6239 results derived from 466 samples. Court appointed experts<sup>11</sup> submitted an additional 2,166 results derived from 178 samples. Chevron submitted more than 8 times as many results as the plaintiffs. Here we see Fajardo’s objection to homogenization at work. The greater number of samples submitted by the defendant lowers the overall average of contaminated sites by including uncontaminated samples.

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<sup>11</sup> Excluding Richard Cabrera’s work in the Technical Summary Report.

Party	Samples Taken	Results derived	TPH less than 1000ppm	TPH between 1000ppm - 5000ppm	TPH greater than 5000ppm
<b>Chevron</b>	2,371	50,939	88.2% under 1000ppm		
<b>Plaintiffs</b>	466	6239		62% over 1000ppm	
<b>Court Appointed Experts</b>	178	2,166			
<b>All Results</b>		17% from plaintiffs	79.7% (of this 80.4% of results provided by Chevron)	10.3%	10%

Ppm = parts per million

*Figure 28 Table compiled by author from information in the Sentencia.*

Here the importance of the dispute I quoted above becomes apparent. For the measure of Total Petroleum Hydrocarbons, 10% of all of the results submitted presented ranges exceeding 5000ppm of TPH, 5 times the limit in Ecuador and 50 times the limit in the United States. A total of 10.3% of samples fell between the ranges of 1000 to 5000ppm of TPH, and 79.7% results were found to be under 1000ppm TPH. Yet the defendant provided 1984 results, or 80.4% of the sample. Of the results Chevron provided, 88.2 % were beneath 1000ppm. The plaintiffs submitted 420 results that amounted to 17% of sample, and of these 62% showed contamination over 1000ppm TPH. As a result, while the defendant submitted almost 5 times as many samples as the plaintiffs, nearly 80% of their samples were found to be under 1000ppm. The plaintiffs, on the other hand, found that more than half (60%) of their samples were contaminated in excess of 1000ppm TPH.<sup>12</sup> The results from the two parties present two dramatically different portraits of the extent of contamination across the sampled sites.

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<sup>12</sup> TPH is itself a contested measure. It is an indicator of the presence of hydrocarbons, broadly speaking, in a sample. The methods for measuring TPH were also disputed, as the plaintiff and the defendant used different laboratory methods to arrive at their results. Certain methods are better for detection depending on the degree of contamination present.

The issue of representation is significant in an environmental case such as this one because the area under dispute was so large. Allegations of contamination did not involve a single industrial site, but rather dealt with the transformation of a region. Chevron asserted that they would “need to inspect every hectare in the Concession” (Zambrano Lozada 2011, 106) in order to arrive at a decision. Such a standard, however hypothetically possible, would be practically impossible for reasons of time and money. The entire Concession could not be completely known within the context of a lawsuit. As we will see, the samples themselves were not sufficient to confirm or negate the presence of contamination; historical and anecdotal materials, along with the samples, site inspections, statements from farmers, and written expert testimony were also required in order to arrive at the global from the particular.

While an abundance of data resulted from the Judicial Inspections, what these data indicated about contamination was far from self-evident. While there were disputes over the veracity of individual data points, the arguments between Callejas and Fajardo point to a controversy of a different kind: what allows a sample to speak to the state of contamination? A great deal of human labor was required to turn these samples-as-facts into evidence. Representation, as we see in this example of the Judicial Inspections, is not a feature of the facts themselves, but a highly fragile ontological achievement. Values are constitutive in the very making of facts. The representative sample remains an elusive and contested achievement that must be buoyed by other genres of evidence in the *Sentencia*.

### ***Overcoming contradiction: Drawing things together in the Sentencia***

Gathering the participants in the Selva Viva office, the home of the plaintiff team in Lago Agrio, Donald began a toxic tour. Speaking to a group of high school students, he opened with a

brief introduction to the nearly two-decade history of the case. The lawsuit has become a symbol of environmental struggle around the globe. What they will see later that afternoon, he tells them, are the remnants of contamination that persist as physical evidence of Chevron's culpability. But before leading them to the waiting *ranchera*,<sup>13</sup> he notes that the students must first see for themselves the immense quantity of documentation from the case. Organizing the students into small groups, he invites them to step into the room where copies of the *cuerpos* (*legal files*; literally *bodies*) of the case are stored: some 2,500 files, each one containing 100 pages. Stacked from floor to ceiling, the packed cabinets are ominous. The weight of the court record is mobilized here as evidence in its very existence. Donald presents the quantity of documentation, regardless of its content, legibility, or validity, as evidence of Chevron's wrongdoing.

In the lawsuit, however, the sheer production of documents was not enough to reach a verdict. The numbers generated through Judicial Inspections did not lend themselves to a singular explanation of the state of the Concession or of Texaco operations. One genre of evidence could not suffice to answer the questions posed to the court, despite the belief many shared that laboratory tests would reveal the truth. To determine the degree of contamination across the Concession, other forms of evidence had to be called upon— images, site inspections, numbers of pits recorded in historic documents – objects just as fragile as the samples, that could be made to speak, cross-reference, and substantiate questions opened by the sampling data. This drawing together was achieved through the archival work of the *Sentencia*.

Archives are sites of state power and knowledge. Part of the appeal of the archive is the seduction of primary data and original objects (Sekula 1986), yet the archive is more than an

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<sup>13</sup> *Rancheras* are flat bed trucks that have been converted into covered, open-air buses, usually with brightly painted benches and a rack on the roof for parcels. They are a common form of transportation in rural areas of Ecuador.

storehouse of curiosities or official records. As a technology of knowledge production, the archive generates as much as it portends to document. Archives must to be read not simply for their content, but also for the form and context through which they produce knowledge about the world (Stoler 2002). By reading the *Sentencia* as an archive, I draw attention to the ways that disparate evidentiary objects were drawn into the same frame to construct a coherent account of Texaco's activities. The work the *Sentencia* does is multiple: it creates congruencies where they previously did not exist; it coordinates data that were otherwise contradictory; it aligns objects of different genres (images, letters, and metrics) in order to make a truth claim about Texaco's operations in Ecuador. Such truths depend as much on the specific content (samples, documents, claims) invoked in the case as on the coordinations and alignments of the evidentiary materials.

Zambrano's document is not a repository of uncontested objects or a pronouncement of ultimate truth. Thinking of it as an archive allows us to ask which histories, soil samples, political forces, natures, bodies, or economic givens were written into this compilation of an official set of facts, and which forms of knowledge were written out. The *Sentencia* has a regulatory function. It invokes legal conventions to police what constitutes reliable evidence, pronounces when a sufficient amount of evidence has been reached, and evaluates what makes the objects presented compelling. The *Sentencia* does not simply reprise the court record. It (re)presents that information in an essential step in the production of evidence.

The court record is cumbersome, often poorly photocopied and difficult to read, and too voluminous to be mobilized outside of the few sites that maintain a physical copy of it. The production of evidence in *Aguinda* required a tremendous campaign of inscription in order to transform the facts of contamination into objects that could be mobilized in the *Sentencia*. The act of inscription, following Latour and Woolgar (1986), has the effect of removing the

scaffolding required in the making of a given representation in order to extract figures, images, a map, or text. The resulting inscriptions are all that count in knowledge production: very little can be said about the soil over which Callejas and Fajardo argued, but great claims can be made from the statistical analysis of from the samples.

The ability to move from objects to graphic representation is crucial to the construction of facts. It would have been impossible to consider all of the soil samples in their individuality, at the very least for the overwhelming number of them. Inscription allows the samples to be acted upon: moved out of laboratories, compared, analyzed, interpreted, and circulated as numbers, figures, and maps in the court record. As Latour notes, “Realms of reality that seem far apart (mechanics, economics, marketing, scientific organization of work) are inches apart, once flattened out onto the same surface” (1990, 54). Now in a homogenous and combinable form, disparate elements of the 20 years of Texaco operations come into contact through the *Sentencia*.

Evidence makes absent things present. The translation of this presence is made possible through the contrivances of perspective, projection, maps, documentation, and images; processes which allow, ideally, for translation without corruption between a state of affairs and the evidentiary record (Latour 1990). The resulting representations can be shuffled, combined, and reassembled through the work of the *Sentencia*, producing hybrid forms of evidence that draw simultaneously from soil samples and historical records. I will address how problems with numerical data were resolved through the use of historic documents and the invocation of the hypothetical standard of the “average good oil company” in order that the evidence could speak to Chevron’s responsibility for multiple kinds of harm.

As we saw, disagreements over sampling procedures were many. Although beyond the scope of this discussion, there were also disputes regarding the laboratory methods used to detect



or measure chemicals, the accreditation of the laboratories used, and the use of impartial expert testimony. On top of this, there were allegations of fraud or tampering with evidence. As the Judicial Inspections illustrate, there was no single agreed-upon way to take soil samples. Contamination proved far more slippery for its technical tools. Elusiveness does not mean that contamination is not present, however; instead it highlights a point frequently argued by those involved in the empirical study of scientific practice: there is no direct access to nature (Latour 2004). Technologies of measurement are always partial, particular, and constituted through prior knowledge and position (Haraway 1988; Barad 2007).

In discussing the divergent results in his *Sentencia*, Judge Zambrano concluded that to resolving discrepancies in the sampling process required consideration of the quantity of samples. Because sampling involved a statistical rather than an accounting exercise, he argued that some errors along the way should not affect overall assessments of contamination. In other words, while individual data points might diverge, Zambrano maintained that the results pointed overwhelmingly to the conclusion that the Concession was generally contaminated. Thus, while the 54 Judicial Inspections could not cover every hectare, they could be extrapolated to enable the court to “deduce the foreseeable results in the rest of the sites not considered in the sample” (Zambrano Lozada 2011, 106). For Zambrano, the debate between Fajardo and Callejas over where to sample and how many samples to take formed no impediment to assessing contamination throughout the Concession

In order to make this claim, it was necessary to establish that Texaco’s operational practices were consistent across the Concession and throughout their contract – a problem, as noted earlier, given the geographic spread of the operations. Citing an abundance of samples, 97 expert reports, and the widespread presence of TPH in sampled sites, Zambrano argued it is

reasonable to extrapolate from the sampled areas to conclude that the various oil fields of the consortium were all similarly contaminated. Yet this move from the specifics of individual, sampled sites to an assertion about the Concession as a whole required caveats:

In this form ... we should analyze the reach or the extension of said contamination of soils within the area of the Concession, with the warning that one cannot understand that all of the soils of the area of the Concession are found to be contaminated, but rather that the samples are representative of the places where they have been taken. However, considering the quantity and consistency of the data from the 54 Judicial Inspections completed on sites operated by Texpet, it is appropriate to analyze the possibility of extrapolating this data for the other installations operated by Texpet that have not been inspected in this lawsuit. That is to say, we will not base ourselves on the premise that the results of the samples of the analyzed sites in the Judicial Inspections are direct proof [taken] from the un-inspected sites, but that the quantity of the inspected sites leads to consideration as a representative sample of the universe of sites operated by Texpet, so that the results of the inspected sites can be extrapolated. The idea is strengthened in great part by the similarity of the results in the completed inspections. (Zambrano Lozada 2011, 106)

Establishing consistency allowed the court to calculate quantities of contaminated space by referring to existing records. Historical aerial images taken by the Geographic Military Institute allowed 880 waste pits to be located. Drawing on these images, in combination with documents from PetroEcuador, the court calculated that a total of 7,392,000 cubic meters of soil were contaminated within the Concession. Since Texaco had not turned over records concerning the precise number of pits it had constructed or their dimensions, the court calculated an average of 60 x 40 x 2.4 meters for each pit, with 5 additional meters beyond the original boundary for possible spills and leaks. By extension, Zambrano concludes that surface drinking water suffered a “considerable impact” from the dumping of at least 16 billion gallons of formation waters. Constant filtrations from the pits would also have affected ground water sources (Zambrano Lozada 2011, 125). This extrapolation enables calculations of large numbers that would have been impossible to achieve through accounting practices, that is, by visiting each and every hectare of the concession. Establishing consistency regarding Texaco’s operating practices

allowed the court to make other moves to characterize the Concession. The judge used these calculations to estimate the cost of remediation.

Despite treating sampling results as a statistical endeavor, and establishing consistency of operational design across operation sites, the substantial differences in the results of sampling remained problematic for the court. Pronouncing the differing results “untrustworthy,” Judge Zambrano questioned why the defendant’s results showed relatively low levels of contamination while other studies, completed by court-appointed experts as well as plaintiff experts, demonstrated far greater levels of contamination. Citing these discrepancies, as well as problems in sampling ambient sources, he drew on non-numerical, documentary evidence in order to move beyond the differences. The court found particularly telling a letter written by a Texaco official that acknowledged the dumping of waste into the surrounding ecosystem during the 20-year operations:

...we make it clear to the litigation parties that what cannot vary is the true fact that the legal representative of Texaco Petroleum Company, Rodrigo Pérez Pallarez, through a letter addressed to Mr. Xavier Alvarado Roca, President of Vistazo magazine, ... March 16, 2007 ... declares and recognizes that “in Ecuador 15,834 million gallons were dumped between 1972 and 1990 during the entire period of operation of the Texaco Consortium”... Following this public declaration of Texaco Petroleum Company’s legal representative in Ecuador, it is true the existence of a considerable dumping of formation waters into the ecosystem of the area of the Concession, from which it results not only reasonable, if not inevitable, that it would have caused an impact on the ground water as a consequence of this dumping. (Zambrano Lozada 2011, 112–113)

The court used the fact that a Texaco representative made a public admission of dumping to resolve the contradictions in sampling based on the assumption that environmental contamination would have been a logical consequence of the dumping of such quantities of waste. The statement’s validity hinged on its author’s position as affiliated with the defendants.



Figure 29 An example of the summary sheet of results for the Judicial Inspections of Lago Agrio #15 as part of the Annex E. Here aerial images from the Geographic Military Institute (IGM) are compiled alongside drawn maps of the sampling site including bars to visually indicate contamination levels, summaries of testing data, and the location of the testing site within a global map of the Concession (Annex E, pp. 38-39).

### Historically Specific Standards

Texaco's operational practices, such as depositing crude on roads to keep down dust, are widely known by residents throughout Amazon. As Rodrigo Pérez Pallarez's public admission of dumping wastes in the Guayaquil-based *Vistazo* magazine indicated, Chevron does not dispute many of these practices: Texaco dug pits without liners; inserted gooseneck tubes to facilitate drainage; routinely burned pits to dispose of crude waste products; covered roads in oil. What Chevron lawyers did dispute, however, were the consequences of those practices and whether or

not these operations were unusual in 1972-1992, or unique to Texaco. Did Texaco opt for cost-saving mechanisms in Ecuador that differed from their practices in other places, such as the US?

A central task for the judge was to determine if Texaco was at fault for operating choices such as the construction of unlined pits, the use of the gooseneck pipes, and the dumping of production waters. When Texaco arrived in Ecuador in the 1960s, environmental regulations were minimal.<sup>14</sup> However, since 1971 the Law of Hydrocarbons has included provisions calling for operators to “adopt necessary measures to protect flora, fauna, and other natural resources,” and to avoid the contamination of soil, water, and air. Throughout the time the consortium operated, the law was amended several times, and included a requirement to turn over plans to the Ministry of Energy and Mines that would detail how natural resources would be protected and adverse impacts mediated. Amendments required compliance with national environmental laws such as the Law of Waters (1972), the Law of Fishing and Fishing Development (1974), and the Law for the Prevention and Control of Environmental Contamination (1976) (Kimerling 2006, 433). Many people I spoke to maintained that the government rarely enforced these regulations. When it did levy fines on Texaco they were so minor that they did not constitute any significant deterrent. In this regulatory vacuum, Texaco effectively set its own environmental and operational standards (Kimerling 2006, 436). It was not until the early 2000s that Ecuador developed comprehensive environmental regulation for the oil industry. As a result, the court was tasked with evaluating Texaco operations in terms of the standards that applied in the industry historically, that is, from the 1960s to the early 1990s.

Determining historically specific standards posed a problem. As Zambrano noted, the experts came to contradictory conclusions about the existence of environmental damage in their

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<sup>14</sup> For more on the history of environmental regulation in Ecuador see Chapter 4.

reports, despite referring to “the same reality” of what had occurred (Zambrano Lozada 2011, 94). To overcome diverging understandings of Texaco’s conduct, the judge followed a precedent from the First Chamber of Civil and Mercantile Old Supreme Court concerning how to determine fault retrospectively. Its legal doctrine of predictability develops a hypothetical model of comparison based on ‘average attitudes’:

In the first model, also called the objective, the general predictability of an example subject or prototype is considered. It is a calculation of an anticipated vision of the probable results in accordance with the average attitude of the people; for example, the good father, the wise man, etc. ... In this case, according to the objective criteria, we need to calculate the predictability according to the average attitude of a ‘good oil company’ of the time. (Zambrano Lozada 2011, 81)

The judge used this hypothetical entity, the ‘good oil company,’ to calibrate reports of Texaco procedures in comparison with the company’s knowledge and capacity at the time of its operations.

Citing the unresolvable differences between the two parties’ experts on the “same historical moment,” the Judge drew on a 1962 text published by the American Petroleum Institute in Dallas, the *Primer of Oil and Gas Production*, to ascertain historical standards for oil operations. Given that the text was published prior to the start of Texaco operations in Ecuador, the judge asserts that it can assumed with “complete certainty” that the text is “objective, impartial” and “closely reflects what could have been expected from an ‘average good oil company’” at that time (Zambrano Lozada 2011, 81). Notably, a Texaco official, Mr. T.C. Brink, authored a chapter entitled “Special Problems,” which warned about the need for taking precautions in dealing with the products of oil operations. Judge Zambrano interpreted this to indicate that Texaco officials were well informed of the risks posed by oil drilling and its byproducts such as production waters, since these were discussed in the text. As with Pallarez’s

admission, Brink's position as a former Texaco employee proved essential to the validity of the document, and thus its inclusion as evidence in the case.

The *Primer of Oil and Gas Production* reflects the standards the American Oil Institute used at the time, and includes recommendations to mitigate the dangers of formation waters. In a portion of the text excerpted by Judge Zambrano, the authors write: "Extreme care should be employed to handle and dispose of produced water not only because of the possible damage to agriculture, but also due to the possibility of contaminating lakes and rivers that hold drinking water as well as water for irrigation" (Zambrano Lozada 2011, 81). Zambrano mobilizes the text to establish the expectations of an oil company, from the perspective of an oil company, to establish historically-specific industry knowledge.

Throughout the lawsuit, Chevron lawyers maintained that the issue of production waters had been inflated and their effects were unsubstantiated. In one notable moment during the Judicial Inspections of the Lago Central Station, attorneys for the defendants argued that production waters were simply a natural component of oil exploitation.

Much has been said during the trial of the famous production waters, of the formation waters, figures are invented and astronomical quantities are mentioned without any supporting documents. We have never accepted it as it was mistakenly said, that Texaco Company has dumped into the environment any petroleum, such figures will have to be evidenced by who claims them. But, what is the production water or formation water? It is the water that exists in geological formations that contain petroleum in the soil. Upon the perforation of the well, it comes out together with the petroleum and must be separated because it would be uneconomic and not technical to transport production water across long distances as is done with petroleum for its trading or refining... [] It has certain metals, we are not denying this, these are metals naturally found in petroleum, in variable amounts also, the production after that is produced in the eastern region of Ecuador contains metals in amounts that do not represent a risk to human health. This has been demonstrated in the laboratory tests that have been conducted in all stations that have been inspected to date... (Zambrano Lozada 2011, 113–114)

Citing samples taken by Chevron expert John Conner that found 1.31 mg/kg of barium present in one sample, Zambrano notes the contradiction between Chevron's argument that production waters are innocuous and the samples they themselves submitted. "So it is clear that we are not facing a harmless element, as lawyers for the defendant assure us" (Zambrano Lozada 2011, 114). Drawing on the letters from officials at the time of Texaco operations, Judge Zambrano poses the question: could Texaco be expected to have had the knowledge and technical capacity to prevent damages at a reasonable cost (Zambrano Lozada 2011, 80)? To find that the company elected to proceed with operating decisions that they knew would harm the environment and people who resided there would constitute "seriously guilty conduct."

The use of historical documents proved critical to the evaluation of appropriate behavior. Zambrano quotes a letter from the Governor of Napo province, Mr. Ney Estuipiñan Recalde, to Engineer Rene Bucaram, then General Manager of Texaco, on 21 March 1983, as evidence that company officials were aware that their operations were contaminating the Concession:

...It is the citizen clamor, Mr. General Manager of Texaco, the grave damage that is being caused in the sector of Shushufindi due to the contamination of waters, rivers, and streams from the spilling of hydrocarbon wastes by the workers of the CEPE-Texaco consortium ... Based on the above grounds, in the most humble manner, allow me to ask you to take the right measures to avoid the continuation of these damages, which will not escape your illustrious judgment, because they will eventually have incalculable repercussions for the ecosystem, and in particular the agricultural sector. (Zambrano Lozada 2011, 80)

Texaco had both the knowledge and technical capacity to dispose of production waters by re-injecting them deep underground as early as 1974. Accounts that demonstrate that the company did not use sufficient care in handling formation waters, or that officials had ignored warnings such as the one by the Governor of Napo, allowed the judge to infer that the company had not behaved as a hypothetical good oil company of that time. Judge Zambrano concludes that the



company had the ability but not the will, likely due to the added expense, to invest in reinjection technology (Zambrano Lozada 2011, 161–166; Barrett 2014, 88). Zambrano notes that:

“The actors have argued that Texaco had the knowledge and technical ability to prevent such damage, which has proven to be true, such that the damage was not only foreseeable, but also avoidable. As such, and since the duty is legally demandable from Texpet to avoid such damage under the historic legislation in effect in the era in which it operated the Consortium, in the opinion of the Presidency the acts of the defendant are evidently a conduct of gross negligence,” (Zambrano Lozada 2011, 175).

Texaco did not, Zambrano concludes, treat production waters with the necessary caution, as a “good petroleum company” would have done.

Within the Sentencia, elements distinct domains, natures, and scales are connected, differences in samples, standards, and times are flattened out, and objects are made to respond to questions about responsibility, contamination, and the behavior of a “good” oil company.<sup>15</sup> Historical letters to Texaco officials, public admissions from Texaco officials in media, and texts written at the time of operations are drawn into the same picture as contested soil sampling data. No evidentiary form stands alone; neither numbers nor letters sufficed to answer the question posed. It is these movements across genres of evidence that allow assertions of truth or claims of representativeness to be made.

### ***Evident but not evidence***

Leaving Taracoa, we take the “old road,” one of the first roads Texaco built when it opened operations in the Yuca camp. Two cows trot in front of the truck as overhanging

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<sup>15</sup> This standard of the ‘average good’ oil company raises many questions. Average behavior of oil companies need not be the same as good behavior. If we were to ask about the “average” behavior of oil companies today, it would be a different question than asking what a “good” oil company is or does. The use of a hypothetical standard glosses many important issues concerning corporate responsibility.

branches and grasses whack the sides as we bump along. It is narrow cut through the surrounding green, just wide enough for one vehicle to pass, with a mound of overgrown asphalt down the middle. The man driving, who works with the plaintiffs, stops the car. *This* he says, as we walk around, *is how Texaco made roads. This is an environmental liability (“un pasivo ambiental”).*<sup>16</sup> Texaco had over 600km of unpaved roads throughout the Concession (Kimerling 1991), upon which crude oil was routinely applied to keep dirt down until the end of the 1990s, coating peoples’ bare feet and shoes and running into nearby streams whenever it rained.

We continue to make our way out of the community. The forest opens to reveal expansive cleared slope. Another man in the truck, also a plaintiff and a resident of this community, waves his hand in the direction of the valley below. The grass that covers the valley is a different hue of green than the hilltops. *This is the only thing that will grow here now*, he says. *The pipeline used to pass over this area, and there were spills all through here. The whole area is contaminated, and now nothing else will grow.* It is deceptively green. If someone who lived here hadn’t told me, I never would have had reason to suspect that the soils were contaminated. But to a trained eye, the difference of color, the changes in the grass, indicate the chemicals beneath. The company might be gone, but contamination endures. For the individuals I am with, these crude paths and shades of green speak to Texaco’s legacy. What is evident depends on position.

Some months later, I was on a tour of sites in the Amazon run by Chevron representatives. People in the Amazon frequently refer to the practice of dumping crude on dirt roads as a feature of early Texaco operations. A well-known image has circulated over the years of the first signing plaintiff in the lawsuit, Maria Aguinda, with her then young children standing

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<sup>16</sup> *Pasivos Ambientales* are an important economic technique of evaluating harm from oil and mining operations. See Russi and Martinez-Alier (2003).

barefoot on the Via Auca in front of her home, the road sticky from fresh crude (Dematteis and Szymczak 2008). Others frequently told me how the streets of Lago Agrio would become an impassable mess whenever it rained, fresh crude staining feet, shoes, and pant-legs as people made their way about town. A journalism student in the group posed a question about this to the Chevron spokesperson. *This is a very common practice*, he responded. *It is called 'road oiling' in English.* He continues:

Before asphaltting a road, they put down oil in order to keep the dust down. The [municipal] authorities asked for it in the Amazon in order to keep the dust down. One doesn't spill oil just to spill oil, because oil is a product that is sold. But what they did do was take degraded crude from the pits and put it on the roads. If it has affected the health of people, I don't know, but it hasn't been proven in court.<sup>17</sup>

Here evidence of harm is found in the traces – the remnants of decades old, sun-baked crude cutting through the jungle or the shades of green that mark distinctions between the grasses that grow in areas affected by old spills. These traces reach back through the past to reveal the actions of a company that is no longer present. Yet such traces are not, and cannot be, official objects of evidence in a courtroom. Without inscription, they cannot be made to speak to whether or not decaying crude on the roads has harmed human health. However, for the people that I was with, there is no need for such translation – the status of these traces as evidence of Texaco's responsibility has never been in question.

There is nothing inherent about evidence that allows it to be *evident*. Indeed, some of the most compelling objects of contamination may not operate as evidence in an official legal or scientific capacity. But they continue to do other work to inspire action or outrage in the daily lives of residents, in toxic tours, or in the visual materials in which they circulate beyond the region. In the same way, there is nothing indisputably *evident* about those objects that have

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<sup>17</sup> The above dialogue is reconstructed from my fieldnotes and is not a direct quote of the spokesperson.

passed through all of the requisite chains of calibration and alignment in order to function as legal or scientific evidence. Disputes over sampling show us that there is much at stake in the making of facts, and that facts do not lend themselves to a single interpretation of what happened during Texaco operations. Although the smell of a soil sample is erased as it turns into a number and then a statistical average, the smell retains its grip when you speak to those who live and farm that land. The scientific and legal process of erasure heightens tensions around what is apparent and what counts as official forms of evidence.

What is *evident* is deeply entangled with the body. The palpable smell of oil in soil, the sensation of nausea from the fumes of a gas flare, the distinction between shades of green are all perceived by bodily senses. They convince because they are experienced, because they depend on proximity and human perception. The erasure of such evidentiary features in scientific and legal processes of producing evidence renders invisible the experiences of precisely those individuals who have intimate knowledge of the matter at hand, and it renders marginal the knowledge of those who have suffered the consequences of Texaco's practices. This process of marginalization must be accounted for when we consider what counts as evidence in determining corporate responsibility.

Evidence-based medicine emphasizes the use of empirical evidence to improve the practice of medicine. Frequently depicted as a pyramid, the hierarchical schema classifies evidence by its epistemological strength. At the base of the pyramid are unsystematic, anecdotal information as well as animal studies, followed by case studies, case control studies, cohort studies using a large population, and randomized control trials. Based on the idea that decisions should be based on scientific evidence, and not on the beliefs or anecdotal experience of experts, the pyramid illustrates the ways in which forms of (in this case, medical) evidence are

characterized. In a similar sense, the *Sentencia* drew on a variety of evidence (claims, texts, samples, images, and expert testimony) in order to arrive at a decision. No one form of evidence, however rigorous, was sufficient in order to answer a question of this scope.

My intention in insisting on the evident, obvious qualities of contamination in contrast to official forms of evidence is not to invert the evidentiary pyramid by arguing that the body has a more privileged relation to truth than other forms of evidence (e.g., instead of privileging randomized controlled trials or randomized sampling procedures, to privilege instead bodily claims of perception). Bodies are often vested with authority, for the primacy of – *it happened to me, or, I saw it with my own eyes* – lends an immediacy to truth claims based on bodily experience. Yet bodies are also multiple (Mol 2002), suggestible, trickable and deceptive. This is precisely what representatives for Chevron have argued: that the anecdotes presented by the plaintiffs are not corroborated by rigorous control studies of the population, or that the use of prior knowledge about a specific well for determining sampling is biased. In arguing for the inclusion of bodily knowledge, I do not aim to promote a wise or more authentic body over numbers, samples, or other forms of evidence, but rather to insist on the situatedness of all accounts, from the most technical to the thoroughly experiential. At the same time I point to ways that the bodies and knowledges of those closest to contamination are often written out of official forums of science and law, producing a persistent tension between what is evident and what makes evidence of harm.

Despite the leveling work of the *Sentencia*, different genres of evidence do not operate on an even playing field. Many might assume that the numbers should suffice to settle questions of responsibility and establish truth: is the soil contaminated, or not? Within this commonsense view, numbers are assumed to be a purer, or more objective, means of assessing harm than

anecdotes. If the numbers are not conclusive, then perhaps it is due to a problem: there isn't enough data; the data were collected incorrectly; their interpretation is wrong.

In regard to this lawsuit, Chevron has insisted that there are problems with the numbers in order to maintain that contamination has not been proven. Yet the *Sentencia* shows us that no one genre of evidence – including the numbers, or soil and water samples – sufficed to answer the question put to this court. It also shows us that when addressing historical responsibility for environmental damages, more evidence does not necessarily lead to a clearer answer. Certain forms of bodily knowledge, often quite compelling to those who experienced an oil spill or know where dried tar lies, were written out of this account in the achievement of other claims.

Evidence is expected to be 'incontrovertible.' Suggestions that evidence is contingent, or not completely self-evident, may be marshaled to argue that the claims made on its basis are not valid. The expectation that a matter can be known in its entirety – as in Chevron's insistence that the court needed to assess "every hectare of the Concession" – has become a way to undermine processes of justice. A close reading of the *Sentencia* reveals the labor necessary for facts to be produced and to speak beyond the immediately present, a work of coordination inherent to all forms of knowledge production. Representation is not a feature of the facts themselves, but a highly fragile ontological achievement. Evidence is never conclusive in the abstract, idealized sense that we expect it to be. Samples are every bit as contingent and dependent on human associations as letters from former officials or abstract standards of behavior for oil companies. I suggest that this open, contingent nature of evidence demands a reconsideration of the exclusions involved in legal and scientific processes of making harm, especially in matters involving corporate and state responsibility for those affected by industrial operations.

## BOUNDED IMPACTS, BOUNDLESS PROMISE

### *Geologically Optimal*

A presentation of the Environmental Impact Assessment for a new set of wells that the Andes Petroleum Company proposes to drill in the northeastern corner of the Ecuadorian Amazon has just concluded. One of the wells is sited near the community center and school, as well as several homes. A woman stands, attempting to appeal to the officials' humanity, rather than their technical expertise. She expresses concern that noise from the drilling will be unbearable, given the well's proximity to her home. Would the company consider moving the platform or at least agree not to run the drilling equipment at night so that her family might sleep? The company engineer is visibly tired of hearing about the well's location, a topic about which people have spoken repeatedly during the question and answer period. He informs her that her comment has been recorded, but that changing the platform location would be an option only if it proves technically feasible; the sites selected are "geologically optimal." The company's Community Relations Officer steps in, but the engineer cuts him off before he can say anything: *The company's first interest regarding this platform is to extract hydrocarbons. He pauses. Then we will get to other concerns. The EIA lists the permissible limits, so please inform yourselves. We will take two more comments.*<sup>1</sup>

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<sup>1</sup> Italics indicate reconstructed conversation from fieldnotes. I have done my best to accurately re-create what was said from notes, however statements should not be taken as direct quotes unless indicated. All names have been changed.

An “EIA” refers to two things: it is both a set of scientific practices and a document. EIAs characterizes and evaluates the potential Impacts<sup>1</sup> to the environment and local community of a proposed project, and analyzes risks and proposes means of preventing and managing potential negative impacts. EIAs are required by law for every step of oil exploration and production. Teams of experts turn terrains into a set of facts that take many forms – numbers, lists, charts, statistical evaluations, and narratives within a several hundred-page document – which enable this particular place to be compared to others. This categorization, measurement, and community presentation solidifies certain impacts as important, and others as irrelevant. Such technologies of quantification predispose representation of the places and phenomena toward certain kinds of ‘objective’ knowledge that reifies the information in the EIA as neutral. By defining Impact as something that can be positive or negative, the document makes manageable all conceivable consequences of oil operations such that there is no potential Impact that does not also have a solution (Li 2009; 2015). The question of *whether* the project should proceed at all is rendered unthinkable.

The practices of making an EIA render the material, historical, social, and aesthetic aspects of the place as Impacts in the document. Impacts are discrete, value-free descriptors, that allow neutral evaluation of a potential project. In an era of risk assessment, many assume that the process of creating and approving an EIA enables better governance of industry. Increased documentation is expected to lead to greater accountability between companies and the places

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<sup>1</sup> I capitalize the word Impact in order to specify the particular object the EIA produces. Politicians, environmental consultants, oil company workers, farmers, and activists used the word impact frequently throughout my research. At times, they were making specific reference to Impacts as defined by an EIA. At other times they used impact to refer to the consequences of oil production more generally. By capitalizing Impact, as the specific object and unit of assessment in the EIA, I aim to denaturalize it, and to call attention to the slippage when Impact comes to stand in for a confluence of impacts.



they work and, ultimately, to reduce damages to environments. Given the requisite legal status of the EIA in many countries, the document has become the principal means of assessing, documenting, and preventing environmental harm produced by industry. Under Ecuadorian law (Special Decree 1040), an EIA must be presented to the affected community in order for any proposed operations to proceed. However, the Ecuadorian state also has a financial interest in developing oil reserves. Rather than being an objective mechanism of evaluation, through ethnographic example, I will demonstrate that the EIA shapes a world that it purports only to represent. By bounding the Impacts of oil production in time and space, the EIA establishes a political and dialogical space in which potential negative consequences for human and animal life are discounted while the benefits brought by oil extraction remain unquestioned.

In this chapter, harm – or potential, future forms of harm given the form of Impacts – is instrumentalized for the regulatory apparatus of the Ecuadorian state. Expert means of bounding harm are tightly linked to the continuation of a state extractive agenda. In conjunction with Chapter 3 on the making of legal evidence, together the two illustrate how scientific technologies and documents – have important consequences for what counts as harm and what does not, and for how life is lived in oil producing areas of the Amazon.

The Cardno Entrix consulting company completed the EIA I discuss here for Andes Petroleum. I was present for its public presentation (*socialización*), as well as for multiple other EIA presentations in the region. The tensions evident in the opening question and answer period highlight the dramatic differences between the concerns of company representatives, environmental authorities, and the community. In order to understand better these contested positions on the EIA, I carried out informal and semi-structured interviews not only with members of Amazonian communities, but also with technicians from local and national offices

of the Ministry of the Environment, government officials working in the Program for Environmental and Social Reparation in Quito, and private environmental consultants in Quito. To situate this particular meeting and document within the broader regulatory process, I attended multiple EIA presentations and reviewed EIA documents completed within the past 10 years. While the examples I analyze in this chapter are drawn from one particular document, I am concerned with the EIA's function in oil extraction more generally.

I selected this particular EIA because environmental consultants repeatedly mentioned that Cardno Entrix had a reputation for high quality studies. I am not arguing against the use of the EIA as a tool of accountability and environmental protection; nor do I aim to critique the authors of this particular document or question the caliber of the scientific practices on which it is based. Many individuals with whom I spoke mentioned EIAs that were poorly executed or obviously copied from previous studies; these are other concerns entirely. Instead, I want to call attention to the ways in which the practices that result in an EIA formalize the consequences of the oil industry. Despite its narrow legal designation, the EIA has become a proxy forum for broader discussions about the consequences of oil development for Amazonian communities. I highlight here how the representative practices of making Impacts in EIAs shape how extraction proceeds in the Amazon.

### ***Oil production and environmental regulation in Ecuador***

For the first two decades of oil operations in Ecuador, the industry operated under a “gentlemen’s agreement” that informally governed the industry and provided minimal oversight. By the early 1990s, however, the tide was shifting. As international concern for the environment grew with events such as the UN Earth Summit in 1992 and the Kyoto Protocol, momentum was

also gathering in Ecuador in relation to the 1993 initiation of *Aguinda*. The “gentleman’s agreement” was replaced in 1992 by the *Ministerial Agreement No. 621*, subsequently replaced in 1995 by the *Environmental Regulation, Executive Decree No. 2982*. A year later, in 1996, the Ministry of the Environment was established and given full responsibility for environmental management. When the Law of Environmental Management was passed in 1999, it introduced concepts of sustainable development into Ecuadorian law (Steyn 2003:229). A nascent form of environmental consciousness was taking shape within the government. In response to the deficiencies of the 1995 regulation, the Subsecretary of Environmental Protection (then a subdivision of the Ministry of Energy and Mines) developed the *Regulation to Replace the Environmental Regulation for Hydrocarbon Operations, Decree No. 1215* in 2001. This regulation provides the rules by which companies must now operate and manages the environmental consequences of industry.

Borrowing heavily from the US Environmental Protection Agency’s policies, Regulation 1215 implemented the Environmental Impact Assessment, Environmental Management Plans, and Environmental Audits as the principle mechanisms of regulatory control, creating along with them space for an industry of environmental services to accompany the expansion of the oil sector. Parallel to these developments, the EIA, first established in 1969 as part of the US National Environmental Policy Act (NEPA), had become a “global tool of accountability” required in all World Bank projects by the 1990s (Li 2009; Sadler and International Association for Impact Assessment 1996). The EIA has since become the most common form of environmental assessment, now employed in more than 170 countries (Morgan 2012:6; Hochstetler 2011).

Regulation 1215 marked the beginning of an era of unprecedented documentation for the oil industry in Ecuador. Oil companies now must hire an environmental consulting company from a list pre-approved by PetroEcuador, the state oil company, to complete their EIAs and Environmental Management Plans. The consulting company should be a third party not vested in the project. Often based in Quito, the environmental services company assembles a technical team to carry out the study. Following the field portion of the study, a draft of the EIA is then shared with the affected community, in accordance with the *Regulation for Social Participation 1040*. Passed into law in 2008, 1040 guarantees the right of communities to be informed of any activity that may affect the area in which they live, “ensuring respect for the collective right of every citizen to live in a healthy environment that is ecologically balanced and free from contamination.” The authorities from the Ministry of the Environment are required to record the community’s response to the EIA and Environmental Management Plans following the public presentation.

Several points deserve emphasis before proceeding. First, the Ecuadorian government owns all oil reserves in the country. Presently, the government depends on oil for 44% of its revenue (Gill 2013). PetroEcuador, the state oil company, has a two-thirds venture with Andes Petroleum, the company involved in this presentation. PetroEcuador has contracted with Andes Petroleum, a Chinese company, to produce oil, for which Andes Petroleum will receive approximately one-third of the revenue, and the state will take the rest. Thus, although the Ecuadorian regulatory process loosely imitates the NEPA model from the United States, there is an important distinction: the US EPA does not have a financial stake in the projects it evaluates; the Ecuadorian Ministry of the Environment does by virtue of national mineral rights. This

underlines what many interlocutors expressed in their conversations with me: the role of the EIA as a regulatory mechanism in the Ecuadorian oil industry is largely perfunctory.

Second, the EIA relies on numerical values in order to determine the comparative importance of Impacts. Impacts are compiled, compared, and made commensurate through numerical evaluations that are turned into percentages corresponding to their overall significance in relation to the project. The work of assigning numerical values is always informed by the broader political economy of oil production. In Ecuador, oil's importance to national economy is an important part of the context in which EIAs operate: oil is the chief national export, representing 59.2% of total exports (CEPAL). At present, 65% of the Amazon has been zoned for drilling (Finer et al. 2008). This particular project in the Tarapoa area is part of a package of oil and mining projects in which the Chinese government has lent Ecuador \$7 billion at 7.5% interest to be repaid with oil and minerals (Gill 2015). The pre-determined importance of oil to the Ecuadorian state is an essential feature of the political landscape in which the EIA operates.

As recounted in Chapter 1, the oil industry and processes of colonization and settlement worked in tandem to transform the Amazon. Visiting the region today, one finds cacao fields and cattle next to oil wells and pipelines. The state and the oil industry directly and indirectly enabled the current configuration of roads, settlement, and fields of cacao, yucca, and plantain. This is important to remember because, as I will show, the calculation of Impacts in the EIA relies on an untouched natural ideal to which all forms of disturbance are compared. Evidence of anthropogenic disturbance serves to justify lower evaluations of natural resources in these sites. By not accounting for complex historical processes, Impact assessment justifies the continuation of industrial projects because the project sites are determined already degraded.

Finally, regulation of the oil industry has inserted new forms of bureaucracy and accounting into daily lives in the region. Since the introduction of the first comprehensive hydrocarbon regulation in 2001, residents of the Amazon have become familiar with terms such as ‘Environmental Impact Assessment’ or ‘Contingency Plan,’ in addition to learning to navigate the many administrative offices of oil companies and environmental authorities in order to register complaints or to seek compensation. Despite the narrow focus of the EIA on Impact identification, EIA presentations have become routine moments of negotiation and interaction with oil companies and state authorities in a place where the state owns all subterranean mineral rights. In short, this regulatory apparatus is a crucial dimension of living with oil in the Amazon today.

Before proceeding, I return to the presentation of the document that opened this chapter. It is mid-day in early March, and I am with Mauricio, a chemical engineer from the local office of the Ministry of the Environment, enroute to Tarapoa for an EIA presentation. We head east towards the Cuyabeno Wildlife Reserve, the location of more than 2,000 square miles of tropical rainforest in the northeastern corner of the Ecuadorian Amazon. The road is impossibly curvy, a line originally laid down with the logic of facilitating entrance between oil camps, which, decades later, is now a regularly trafficked route into the Putumayo. Multiple pipelines accompany us the whole way, occasionally branching off from the main road to a well or station.

It’s after 6pm but still humid despite the growing equatorial darkness. In the *casa communal*, close to 100 people fill the room, seated in lines of school desks, with others leaning against the walls to listen. The air languishes, trapped between the cement walls and the zinc ceiling. A group of representatives from the oil company, along with the environmental consulting agency, are up front. There has been oil activity here since the 1970s. The EIA under

consideration assesses the prospective construction of 8 proposed wells, an oil platform, pipelines, and access roads in an already established oil camp that borders the Reserve. A community of just over 200 people, all those present have sat through more than an hour of highly specialized information regarding the potential impacts and siting of the project. One of the company men is manning a recorder, running up and down the aisle between questions. He inevitably arrives after each person has begun, interrupting the speaker and asking him to begin anew. *Señor, please, first state your full name clearly into the recorder.*

An older man from the community rises, dressed in a faded jean work shirt embroidered with the name of a drilling services company, string loops in place of the buttons long since lost. He leans heavily on the chair in front of him. *Thank you to the Señores from the company, the Senor from the Ministry of the Environment, and the Señor of Community Relations for coming to our humble town. My question has to do with the following: in the new constitution,<sup>2</sup> there is a distance for how close a platform can be from a town center, or a school, or a house. What is that distance?*

The engineer indicates that now that the Ministry of the Environment representative has arrived, he will answer questions on regulation. Mauricio stands. *There is no prohibition on realizing these activities. The Ministry of the Environment requires monitoring, follow up, and of course “prior consult,” as you all know.<sup>3</sup>* Another community member stands to clarify the question. *But there’s no rule that you can’t put a well right here in the middle of the community?*

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<sup>2</sup> Referring to the 2008 Constitution of the Republic of Ecuador.

<sup>3</sup> Prior consult, or “*Consulta Previa*,” as defined in Article 9 of Regulation 1215, requires that prior to the execution of plans for oil development, the oil company must adequately inform communities that are within the direct area of influence of the project, taking into account their suggestions and concerns regarding the plan. The requirement for consult, however, should not be confused with community consent. For more on this see Riofrancos (2013).

Mauricio: *Not within 500 meters of homes*— the Andes engineer cuts him off. *Make sure this is recorded.* He pauses, waiting for the man with the recorder to make his way to the front. *No such thing exists. There is no set limit. What does exist is the ‘area of influence’ – for example, we could put the well 250m from the school as long as we can guarantee the noise won’t reach ‘x’ decibels during the day. Anything below ‘x’ decibels is permitted. But there is no table or rule that says the site must be a certain distance from a school or a town center.* Mauricio nods. *That’s correct. There’s no set limit in the regulation because the conditions for each site are different. The regulation does not rely on standard conditions.*

Another community member stands: *What about the families affected by the widening of the road? Obviously it will be widened, and some of us live less than 3 meters from the road.* The only presenter not outfitted in the all-denim uniform of the oil industry steps up. He is the superintendent of Community Relations for the company, and will be this community’s primary contact with the company through the rest of the drilling and operations. *Well, obviously this is a process. There are permissions, and there is the negotiation. Once the project is approved, then we’ll talk about these concerns – such as widening the road. We are getting ahead of ourselves with these sorts of adjustments [“ajustes”]. We’ll deal with them when the time comes. Once, of course, we have your permission to start.*

Impacts like roads or noise are never experienced in isolation but rather as part of a broader historical process of extraction. As the legally recognized evaluation of places scheduled for oil extraction, the EIA sets the terms through which the Ministry of Environment will assess extractive projects and their consequences. What might seem like concerns about minutiae – ‘x’ decibels, or the official boundaries of influence of the project – have a profound effect for those living alongside industry. This example is illustrative of how the EIA proceeds: the concerns of



the community are minimized (such as calling them ‘adjustments’) as Impacts are made into calculated, individualized measures that are managed by state regulation, while eclipsing broader concerns associated with the oil industry operating in the middle of a community. When Impacts or the “Area of Influence” are extracted from an EIA and invoked as uncomplicated natural objects, the EIA’s power to shape public debate and understanding about how oil acts on environments is evident.

### ***The Baseline Study and Area of Influence***

Consulting teams that work on EIAs mobilize a range of scientific practices in order to transform a place (a home, a forest, a cacao field) into facts (numbers, graphs, categories and narrative) necessary for evaluating a project’s anticipated Impacts. There is nothing easy or intuitive about this shift from place to facts to Impact. The document opens with the baseline study, which establishes the condition of the area prior to the initiation of the proposed project. The authors evaluate the project in light of the information assembled in the baseline study in order to anticipate how the environment will be affected. The authors then determine the project’s “Area of Influence,” analyze potential risks, and identify and evaluate the anticipatable environmental impacts. The EIA’s conclusion consists of the Environmental Management Plan, which addresses how to prevent or deal with the Impacts the study has identified, along with a monitoring plan that environmental authorities will use to register company compliance with the Management Plan’s guidelines.

The baseline study of an EIA reads much like a natural catalog. It divides a place into categories that can be independently measured and evaluated. Long lists of species found within specific transects are identified by their Latin names and meticulously recorded in columns

according to frequency, abundance, and importance value. Forests are categorized by their maturity and degree of intervention, and inventories of rain, soil, temperature, humidity are turned into charts, graphs, and abundance curves. In total, the EIA examines abiotic components (subdivided into climate, geology, hydrogeology, geomorphology, soils, geotechnical, hydrology, noise, air quality, and natural landscape); biotic components (flora, terrestrial fauna, and aquatic fauna); socioeconomic components (a community description, demographics, economic conditions, market and productive activities, health, education, housing, community infrastructure and roads, social stratification and socio-political organization, social conflicts, and community perceptions); and archaeology. Rhetorical descriptions of the “state in which the area was found” contribute to the presentation the topography produced by the baseline study and Area of Influence assessment as an uncontested natural fact. For example, take Table 3-8, which presents the results of the soil samples after laboratory analysis:

**Tabla 3-8: Resumen de los ensayos edafológicos de laboratorio**

Muestra	Horizonte	Profundidad (cm)	Ph	Ce (mmhos/cm)	Mo (%)	Nh <sub>4</sub> (ppm)	P (ppm)	K (ppm)	Textura
M30Su-01	A	0 - 5	5,20	0,15	7,32	25,80	7,90	0,12	Franco. Arcillosa.
M30Su-01	B1	5 - 25	5,80	0,08	4,04	7,90	4,30	0,04	Franco. Limoso.
M30Su-01	B2	25 - 50	5,90	0,13	1,81	7,90	3,50	0,12	Franco. Arcillosa
M30Su-03	A	0 - 5	5,70	0,20	11,3	24,80	6,50	0,07	Franco
M30Su-03	B1	5 - 15	5,70	0,09	4,66	16,90	8,40	0,06	Franco. Arcillosa- Franco. Arcillosa
M30Su-03	B2	15 - 35	6,20	0,06	2,36	10,90	3,80	0,05	Franco. Arcillosa.

Fuente: Resultados de Laboratorio Agrobiolab, septiembre 2011; Elaboración: Cardno ENTRIX. Trabajos de campo, agosto 2011.

*Figure 30 Summary of lab results of soil samples. Source Cardno Entrix (2012:56)*

The listing and tabulating of species, soils, and houses in the baseline study construct the environment in a particular way, as though – following Mitchell’s work on measurement of

electromagnetic fields – “it were ‘naturally’ present for our inspection.” In doing so, “Everyday life becomes commensurable with science through measurement; science becomes linked to discourses on everyday life,” (Mitchell and Cambrosio 1997:251). Through the creation of the baseline study, everyday life in oil producing regions is transformed into information.

A central organizing feature of the baseline study is to isolate a moment in time against which all subsequent changes (“potential Impacts”) can be compared. The baseline study relies on the fiction of being able to stop time in order to make future predictions about harm, thus divorcing historical processes from their outcomes. By dividing the terrain being studied into two distinct parts – Direct and Indirect “Areas of Influence” – the affected region emerges as a circumscribed time and space. It includes the physical spaces in which infrastructure like well platforms and access roads will be constructed, as well as political spaces such as the company’s administrative offices. The authors describe the baseline study as a “prior vision” against which all future monitoring will be compared. The establishment of “prior” and “post” visions is a critical intervention: only by establishing an image of a particular point in time of the “original state” of the place, is it possible to anticipate the future Impacts that could result from the project’s execution (Cardno Entrix 2012, 41). It bears asserting that these boundaries the baseline establishes are not given, but are artifacts of the study.

Characterization is never “just” characterization; the compilation of information is not a disinterested activity (Latour 1986). These devices work in conjunction to produce the material and political space of oil’s influence. Such boundaries are informed by a particular scientific vision and do not represent a natural means of demarcating a project’s influence, yet they are often invoked as mirrors of reality rather than instrumentalized ideals produced to answer a particular objective (Lampland 2010, 386). Yet, in the process of translation from field to

document, the contingencies of the EIA disappear. The EIA shapes places that it claims to only represent.

### ***Impacts and Disturbance***

The proposed project will be located in an area that has already experienced significant human intervention, by both oil companies and colonist farmers. The simultaneous processes of extraction and settlement have created a region in which distinctions between residential and industrial land use have been blurred. The study describes the lowland areas as presenting “strong anthropogenic intervention due to human settlements that exert pressure on the periphery of the landscape,” (Cardno Entrix 2012, 78). Rivers in the study area were found to be contaminated with high levels of fecal coliforms, which, when combined with large cultivated areas and significant habitat fragmentation, resulted in a rating of “medium” for the ‘natural state’ of the study area. Thus part of the EIA’s task in establishing the ‘prior vision’ of the baseline study is to document all anthropogenic alterations to a putatively “pure” nature preceding the particular project. In other words, the evaluation of Impacts also serves the purpose of specifying environmental degradation for which the oil company *cannot* be held accountable, including that resulting from prior industrial activity and the varied effects of colonization. Doing so limits a company’s responsibility to the precise window in which they operate.

The identification of Impacts presumes that particular consequences of oil operations can be effectively separated from the ‘oil complex’ (Watts 2005) in which they are generated and independently evaluated. To do so, the EIA must find ways to commensurate different Impacts. Impacts are divided along environmental and social lines, and then schematically split into

specific categories. For the environment this includes: changes to soil use, quality of water, quality of air, noise, landscape, flora, terrestrial fauna, aquatic fauna; and for the social side, health, economy, infrastructure (Cardno Entrix 2012:221). In a stated attempt to limit the subjective nature of the task, the authors develop six characteristics with corresponding evaluative rubrics to provide a more ‘objective’ framework for comparing Impacts. Such numerical rubrics include: Is it beneficial or detrimental to nature (positive or negative)? How probable is it that the impact will occur (not very probable, very probable, certain)? Is the duration over a short or long timeframe? What is the frequency of the impact (eventual or frequent)? What is the intensity of the impact (low, medium, high)? How far does it extend (immediate, local, or regional)? (Cardno Entrix 2012:224).

In the EIA, great concern is given to the “quality” of the natural resources that exist at the time of the study. These resources are evaluated by the degree to which they have been altered by human activity such that “more significant impacts may occur in less disturbed environments and vice versa,” (Cardno Entrix 2012, 41). One environmental consultant described how company administrators often complained that the environmental impact that a well platform would produce is minor compared to the deforestation caused by farming and ranching. He emphasized the importance of completing the baseline study, in part to establish that oil operations are not responsible for existing alterations to the natural environment:

That’s why you do the baseline, and you see how is the environment previous to the project. So you compare the baseline to the project and see how the project is going to affect the baseline, and the impact is going to be less because [the place] is already damaged. The comparison between the possible Impacts and the baseline gives you the Environmental Management Plan.

When the baseline is already degraded by previous settlement or oil activity, as is often the case, the anticipated Impact of the project will be small in comparison, producing what conservation

biologists have referred to as “shifting baseline syndrome” (Papworth et al. 2009). When the Impacts anticipated in the EIA are small, environmental authorities are much more likely to approve the project being proposed. The EIA’s “vision,” its predictive capacity that rests on construction of comparisons between before and after, is closely attuned to assessment of micro level, discrete Impact while ignoring broader processes such as the history of oil and settlement that the baseline study obfuscates. This vision intersects with assumptions about anthropogenic disturbance such that evidence of human intervention serves to numerically justify the continuation of industry.

The assessment of an environment’s quality in the baseline study affects the degree of exigency of the Management Plan. In the Environmental Management Plan, the consulting group describes how the company will address and mitigate potential impacts. The EIA makes it possible to evaluate places from offices hundreds of miles away in an abstract form. When officials from Ministry of the Environment in Quito (who will not visit the site) review the regulatory precautions of the Management Plan, they will consider the numerical value given for the natural resources in the baseline study. As the same consultant went on to explain, “In a pristine area, in the baseline you will have a very sensitive area and of course the Management Plan will include many more activities to protect flora, fauna, water resources, and the arrival of colonists.” A low value in the baseline study will mean fewer provisions necessary in the management plan. Once approved by the Ministry of the Environment, the Management Plan establishes the standards of operations and environmental protection practices specific for that particular project.

The result is that in areas the EIA describes as ‘more disturbed,’ that is, less natural or already showing evidence of human presence in the landscape, the impact of future oil activities

is judged less important. Differentiating among degree of environmental disturbance presumes the existence of an Amazonian wilderness without culture; this natural ideal in the EIA depends on the absence of humans. The historical conjunctures that have shaped places that the EIA evaluates as “monotonous” or as demonstrating “anthropogenic intervention” – disappear in these evaluations. No note is made of the existence of oil operations in the area for the past several decades, nor of the relations between oil development and settlement in shaping the region. In this framework, it is precisely those locations where human health and wellbeing would likely be of greatest concern – places where there are high degrees of disturbance because communities live and farm in them, or use the surrounding rivers for drinking, bathing, or washing clothes – that the Impacts from oil development would potentially be evaluated as less important in the EIA.

### ***Governance and Alternatives***

While the EIA channels “Impact” into delimited effects with corresponding management plans, usually what residents, environmentalists, and observers mean when they speak of the impacts of fossil fuel industries is much broader. One of the effects of the EIA is to keep these broader meanings out of view. In this final section, I illustrate the political consequences of Impacts as they are employed in the document. In particular, I consider how oil’s status as a “strategic resource” can foreclose meaningful contemplation of impacts, broadly conceived.

Since the mid-1960s, politicians have heralded oil as a promise of modernity for the nation. Politicians continue to promote oil in such terms, despite widespread environmental contamination and growing critiques of the uneven forms of prosperity and inequality oil extraction generates, as well as concerns about the unsustainability of the industry. Under

President Correa, the promise of oil has been rearticulated as critical and necessary to combatting poverty. In 2011, the Correa administration founded the Coordinating Ministry of Strategic Sectors with the stated goal of making rational, efficient and sustainable use of strategic resources such as copper, hydrocarbons and water. The Ministry promotes the sovereignty and productivity of Ecuador's natural resources in order to overcome the socio-economic challenges facing the country. Making intelligent use of these resources promises to reduce poverty and improve every citizen's quality of life, as well as improving income distribution, job opportunities, investment, and economic growth. The EIA is one document in a longer process of oil development; revenue and investment calculations have already been calculated by the state and operating companies prior to beginning the EIA. In defining oil as a strategic resource of the state, the benefits exploitation will bring are naturalized: the EIA is completed in a place where oil's importance to the nation exists *a priori*. Unlike the spatially and temporally circumscribed Impacts in an EIA, benefits can subsequently be invoked in the document and in political discourse as unbounded and timeless.

Every EIA must contemplate several alternative ways to implement a project, in order to produce the least negative impact possible. This involves weighing the relative importance of the Impacts in the Area of Influence against the project's contribution to the country in terms of investment, foreign exchange earnings, and employment (Cardno Entrix 2012, 187–188). In this instance, the primary concern residents raised was the location of the well. The “geologically optimal” site is on the farms of several community members. Residents had stressed that the sited well was too close to their homes and schools and asked for it be moved.

In light of these concerns, the study considers three alternative sites. Only one option involved not proceeding with the project. I quote the entire explanation in the document for why



the option of not drilling was not viable:

Another alternative to consider is not to execute the project, in which case there will be no impacts caused by the partial and reversible loss of habitats, movement of soil, entrance of machinery, additional staff, generation of noise, emissions, wastes, and discharges. However, this alternative is not feasible, considering that, on the one hand, Andes Petroleum Ecuador Ltd. needs to comply with the contract it has with the Ecuadorian State and other commitments, and on the other hand the project will be a source of income for the Ecuadorian State, both in production quotas, as well as taxes.

If the project is not executed, consequently this will eliminate the generation of financial resources, which on the national level, revenues from hydrocarbon activities represent the largest share of revenue to the State. Further and although in a marginal manner the project represents income for the community given that will be necessary to hire local labor during the construction phase and, although in lesser number and for less time, also in the drilling and operation stage. (Cardno Entrix 2012, 188)

Following this, two alternative locations for the well are discussed and compared in a table based on the relative influence they would have on biotic, abiotic, socio-economic, and technical-economic concerns. Regardless of the Impacts the study identified, the possibility of abandoning the project altogether was dismissed as “unfeasible” because of the company’s pre-existing contractual obligations with the state.

The Impacts identified in the study are used to make recommendations about how best to execute and manage the operations. Yet, despite the authors’ caution that Impacts can be both positive and negative, positive and negative Impacts are not treated symmetrically. In the entirety of the 357-page document, only a handful of sentences address the project’s benefits, with vague references to the “beneficial impact that the increase in hydrocarbon production represents for an increase in income for the country,” (Cardno Entrix 2012, 249). While negative Impacts are detailed to a degree of technical exhaustion over hundreds of pages, charts, and analyses, the benefits of extracting oil are taken for granted. Revenue and production quotas are not calculated in the EIA, nor are the jobs that the project would generate; such calculations are left for internal

investment plans in which the decision to proceed with the project was already taken. This asymmetry in the EIA contributes to the idea that extracting oil is unequivocally beneficial, allowing for the brevity of the above statement to suffice for an explanation of why it was not necessary to consider not proceeding with the new wells. In the EIA's analysis of alternatives, not executing the project is not an option.

While the EIA articulates Impacts as proximal effects in a highly circumscribed time and space, it invokes benefits in terms of the nation at large and "the future." Because the EIA constructs Impacts in relation to their control, by definition there can be no negative Impact that cannot be managed and therefore cannot be justified by the assumed benefit that a project will bring (Li 2009). This asymmetric accounting is further compounded by the way harm to environments and human health unfolds, often over lengthy time scales that exceed the predictive scope of an EIA. In contrast, benefits are lofty potentials such as development or the end of poverty, which are routinely cited in presidential speeches, radio programs, and state-sponsored billboards announcing the investment of profits from oil extraction. The result is twofold: the calculation of Impacts minimizes a project's total long-term effect by making discrete effects manageable, while the benefits of expansions of drilling can be invoked as boundless promise.

The Impacts produced in the EIA do not remain confined to the document, but are taken up and travel as part of discourses, legal claims, and presidential speeches. Impacts are the means through which regulation is operationalized. As they travel, the reality of what they present become increasingly solid. That Impacts are contingent elements of a model of evaluation shaped by particular rhetorics, practices, and assumptions becomes difficult to recognize. As the EIA has become the most common form of environmental assessment around the world, it is increasingly

accepted as the most legitimate means of assessing or anticipating the impacts of future operations. This is particularly significant given the Ecuadorian state's ownership of national mineral rights: if the EIA is to function as a scientifically and socially meaningful evaluation of places staked for development, the state cannot have vested interest in the document's making or outcome.

The complexity of oil's consequences as they have unfolded over decades of production, ongoing settlement, and daily life fall outside official bounds of Impacts. This chapter has juxtaposed the ways that discrete, local effects are made manageable through their calculation as Impacts, while the benefits of drilling are expansively invoked through future, national promise in the document and in political discourse. The EIA presentation has increasingly become a forum for negotiation between communities and companies that it was not intended to be. In order for genuine consideration and debate of the benefits and consequences of oil production to take place, impacts and benefits must be evaluated symmetrically in official, public forums. And alternatives – such as not proceeding with drilling – must be viable possibilities rather than perfunctory checkmarks in the EIA.

Oil extraction raises many persistent problems, one of which is that its effects are difficult to anticipate or control. Recent scholarship points to the spatially unbounded and multi-temporal dimensions of ecological harm (Nixon 2011; Morton 2013), underlining the insufficiency of conceptualizing harm in the form they appear in EIA Impacts. This chapter has sought to call attention to the violence produced by categorization that determines what counts as harm and the knowledge practices they imply and exclude (Haraway 2006). One way to denaturalize the official Impacts of the EIA is to insist on recognizing the multitude of impacts from oil extraction that overflow the circumscribed boundaries drawn by regulatory practice.

This chapter argues that such boundaries need to be drawn more inclusively than their present delimitation to accommodate the complex of changes brought by oil extraction.

## **TO BEAR WITNESS: BODILY BURDENS IN TOXIC TOURS**

### ***Toxic Tours***

Throughout this text, I have been following the ways that the techniques of science, law, regulation, and ethnography make harm differently real. Each of these techniques is as situated as it is limited. Toxicity emerges in the relations between settlement and industry, and in the particulars of the ways contamination is oozes into rivers, air, soil, and bodies. One of the principle means through which people who are not from the region have come to know about contamination in the Amazon is through toxic tours, in which a guide brings participants – students, lawyers, environmental activists, journalists, foreign tourists – to visit contaminated sites. Harm is not simply on display in these tours as the name might suggest, but rather is made real by enrolling participants as witnesses – to soil pulled from the ground, oily leaves squished between the fingers, or stories about waste pits narrated for outsiders.

Toxic tours began as a civic forum for education and social change of expeditions to polluted spaces in the United States, most often led by members of communities that had been historically disadvantaged and bore an undue burden of industrial pollution (Pezzullo 2009). Toxic tours emerged in the Environmental Justice movement in the mid-1980s, as activists in North America began to articulate the ways in which race, class, and environmental assault were tightly linked. The movement theorized the ways that certain spaces came to be seen as “appropriately polluted” (Higgins 1994) or as “human sacrifice zones” (Bullard and Benjamin 1999), pointing out the consistent siting of toxic waste sites in low-income communities of color

(Commission for Racial Justice United Church of Christ 1987). The idea of a “toxic tour” was to invite outsiders into spaces they would not normally go, in order to bridge spatial, political, racial, and affective distance by presenting a first-hand demonstration of places where the ‘other’ lived, worked, and played. In the same genre as Toxic Tours are other forms of “dark tourism” (Brook 2009; Willis 2014) such as Holocaust memorial tours (Nager, Pham, and Gold 2013), slavery tourism (Buzinde and Santos 2009; D’Harlingue 2015; Miles 2015) and disaster or death tourism (Sion 2014; Thomas 2014), in which violence, trauma, destruction, or devastation are experientially consumed by participants.

Although there are commonalities between “toxic tours” in different sites (Pezzullo 2009; Checker 2005; Di Chiro 2003), one important difference is that toxic tours of oil sites in the Amazon take many forms. The model of the toxic tour has been borrowed and appropriated by different groups for various political purposes. Toxic tours in the Amazon began informally in the 2000s by a non-profit affiliated with the plaintiffs in *Aguinda*. Upon request, a man who worked for the group, Donald, would take journalists, tourists, lawyers and politicians around to visit sites Texaco had previously operated. Chevron began to offer their own version, not a “toxic” tour, but a “media” tour, to present journalists and visitors with their side. Then, in 2013, borrowing from the model and sites the plaintiffs used, Correa launched his own variation on the toxic tour to denounce the legacy of Texaco publicly as part of *La Mano Sucia de Chevron* [The Dirty Hand of Chevron] campaign. As I will show in this chapter and the next, Correa’s extractive agenda in the Amazon compromised his project in the campaign. What each of these tours makes visible depends on the position vis-à-vis contamination – political, economic, material – of the witnesses participating in the tour.

Toxic tours are supposed to make contamination evident. Participants bear witness to rivers, soil, and bodies – human and animal – damaged from oil operations. Yet, what becomes clear by paying attention to variations on the toxic tours led in the Amazon is that the position of those involved reveals the profoundly unequal toxic burdens borne by some bodies and not others. Some tours – by not attending to questions of privilege, affluence, or spatial distance from contamination – have the unintended effect of naturalizing toxicity. While some figures can be witnesses to toxins *in* nature, other bodies are invoked *as* toxic nature in tours. Who can speak truth to harm, and through what means, comes to the fore. By examining Amazonian toxic tours as a set of practices that depend greatly on the relation of the witnesses to contamination, it becomes clear that the making of harm comes with costs that are not uniformly endured by those involved.

### ***The Genealogy of Witnessing***

The “witness figure is much less homogenous than is often suggested” (Fassin 2008, 552). In writing on the politics of humanitarian work, Fassin explores shifts between witness figures and the configuration of testimony. Arguing that an anthropology of the witness must be grounded in semantic plurality, he traces the etymological roots of the word ‘witness’ in relation to the construction of truth. Building on Fassin’s call for attention to the plurality of witnesses, of central interest to the following discussion is the distinction drawn in Latin between the two words for witness: the *testis* (the third party observer of an event), and the *superstes* (the survivor who lives to tell what happened).

While the *testis* testifies based on his observations as an external viewer or listener, the *superstes* testifies from experience (Fassin 2008, 535). Yet, boundaries between the two are

frequently blurred, in both parlance and practice. Recalling extreme cases such as the proliferation of written and recorded testimony of Holocaust survivors, the *superstes* comes to bear witness precisely because he has survived what others have not. To bear witness to such horrors is to speak truth through personal experience, while at the same time speaking on behalf of those who have perished, becoming both *testis* and *superstes*. Bringing this etymological analysis to bear on conflicts in the contemporary world, Fassin argues that the prolixity of humanitarian aid workers' testimonies often increases in relation to the silence of the survivor. In cases where the oppressed are unable to make their voices heard, the discourse of the aid worker has come to substitute for the voice of the victim: "wherever victims of violence and inequality are supposedly deprived of the power to express themselves, international organizations that defend their cause decide to speak on their behalf," (Fassin 2008, 537).

In the following discussion of toxic tours in the Amazon, several kinds of witnesses are present: a man from outside Lago Agrio who leads tours in the places he grew up; students who are enrolled as witnesses through their participation in the tours; residents who mobilize their bodies to testify to harm; celebrities who are flown from the United States to denounce pollution. Although all of these figures are speaking to the reality of contamination in the Amazon, they do so from profoundly different relations to oil and its effects. While some speak from a place of personal articulation (the *superstes* who has lived beyond what has happened, an apparently subjective claim), others speak on behalf of those Amazonians who have been affected by oil operations (the *testis* who has observed what has happened, enabling an external or objective claim), marking critical shifts in who can serve as witness to contamination, to violence, or to suffering. In what follows, I will show that the testimonies of those who speak *for* harm experienced by residents of the Amazon can have unintended consequences in the politics of



denouncing contamination from oil extraction. By drawing out the differences in these witnessing modalities, my aim is to call attention to the politics of who can speak truth about contamination, and the grounds from which they do so.

### ***La Mano Sucia de Chevron***

On 17 September 2013, the Ecuadorian government launched the first governmental campaign to condemn the legacy of contamination Chevron left in the Amazon. Deemed the “*La Mano Sucia de Chevron*” (“The dirty hand of Chevron”), the campaign was inaugurated on the site of the Aguarico-4 waste pit, the very same site at which this text began.

At the turn off from the road that leads to the well, our van is stopped by a military checkpoint that blocks the road to the event. The soldiers stationed there verify our permission to attend. While I am allowed entrance along with an American friend as “international press,” the wife of a Cofán leader in our group is turned away with the obtuse pronouncement “*no señoras allowed.*”

Arriving, we find that the normally deserted well platform in the middle of the forest has been transformed. A large tent occupies the corner of the dusty platform, with a raised stage and lines of folding chairs awaiting several hundred people. Press vans are parked around the platform’s edges, the satellites on their roofs readied for live transmission. Piped-in music plays over loudspeakers. The place is swarming: journalists, government officials in vests emblazoned with ministry logos on the chest pockets, oil workers in matching jumpsuits and white hard hats, military men with dogs patrolling the perimeter. The place is alive with anticipation of President Correa’s arrival. The waste pit has been cleared of fallen brush and marked by yellow ‘DANGER’ tape. Even waste pits must be dressed for such an occasion.

Back down on the platform, amidst surrounding chaos a small crowd of journalists are interviewing Álvaro, a man who lives a few miles down the road. Álvaro stands, pulling up the bottoms of his silver track pants with his hands in order to expose his legs. They are scaly and red, skin flaking off in large patches. The journalists crouch to zoom in on his body with their lenses, slowly panning up to show his equally raw arms, hands, and neck. Meanwhile, he speaks. His words are fast, pouring out in a hurried stream of a story that he has recounted many times. He barely pauses for breath:

Of course, I have consumed, I've cooked with, I've drank, I've washed in it, I've consumed and will continue consuming [this water]. Here on the Aguarico, [the river] is completely contaminated due to the exploitation [of oil] by the Chevron-Texaco Company. Using low quality technology, they saved millions of dollars and now we see that all the treated water, all the oil that they dumped directly into the streams. Not just people were harmed. This also harmed the environment, the fauna, and people have gotten sick here. Many people don't want to come forward and give testimonies. It's been more than 18 years, [and this has been seen on] many different television channels. Many journalists from all over the world [have come], and people are tired now and they don't want to give [interviews]. Many *compañeros* who lived with cancer have died. I've seen them die here, and well, I keep living so that I can tell you about it.

He pauses. One journalist asks if he can get some close-ups of the man's wounds. Álvaro nods and continues talking, adjusting his clothing to allow the camera a clear view of his exposed skin. *This is a product of contamination*, he says, indicating his sores. *These are unknown diseases*. He begins to list the names of people he knew who have died in his community. Triumphant music sounds in the background.

But, Álvaro was not the star of this show. Minutes later, a caravan of PetroEcuador trucks pulled in to the platform from the access road. President Correa emerged, in yellow rubber boots and a white *guayabera* with the rainbow swirl of the 'Ecuador loves life' logo on its front pocket. He waved at the crowd as patriotic music played. Accompanied by officials from the Ministry of

the Environment, Correa and crew make their way over the bank and to the path along the edge of the pit as Paola Carrera of the Program for Environmental and Social Remediation (Programa de Reparación Ambiental y Social, known as PRAS) and Lorena Tapia, Minister of the Environment, lead his tour. Back in the tent, a live video feed broadcasts, with *EN VIVO: CAMPO AGUARICO 4* scrolling across the bottom of the screen.

Paola takes a long pole to indicate to President Correa the pit's depth by submerging the pole until it hits bottom. Then, moving to the corner where the gooseneck pipe is, they pause and she explains the pipe's design to him, noting that it continues to contaminate the surrounding area even today. They proceed to the area facing the bank where the rope has been readied and President Correa steps out on logs suspended over the waste pit to address the press and assembled audience waiting on the bank above: "Here it is. This is Chevron-Texaco, fellow citizens. This is what they say does not exist ... To the whole world, this is the dirty hand of Chevron." And with that, Correa bent to stick his hand in the oily slop of the pit, holding it out forthrightly for the waiting cameras. It was a gesture that would prove significant.

With this gesture, Correa launched the *Mano Sucia de Chevron* campaign. The encounter with the pit in which guides related factual information, measured the pit's depth and then Correa dug a gloved hand into the surface to experience the nastiness of the crude were all practices that mimicked the toxic tour routinely run by the plaintiffs in the *Aguinda* case.

In the weeks following the launch of Correa's *Mano Sucia* campaign, various invited celebrities made an appearance at the Aguarico-4 site. Mia Farrow, Alexandra Cousteau, Jean-Luc Mélechon, Amba Jackson, Danny Glover, Luis Eduardo Aute, Alberto Almeida, Antonia Juhasz, Montserrat Ponsa, and Eugenio Cedeño each ceremoniously dipped a gloved hand into the pit and presented their blackened palm to the camera as a visual denunciation of Chevron.

While at the waste pit, the celebrities made public statements, expressing disgust. Many were surprised upon seeing and smelling the waste pit in person. As René Pérez, lead singer for the hip hop group Calle 13, commented, “This is the first time that I see this with my own eyes, that I’ve smelled and felt this kind of contamination ... and it is horrible” (EFE 2014). For the campaign, the incredulity of celebrities upon finding oil out of place – in a waste pit in an iconic natural place like the Amazon – was key to the weight of their denunciation of the company.

The celebrities with crude-covered hands held high for the cameras made claims about the contamination based on what they had seen and touched. By bringing outsiders to tour the Aguarico 4 waste pit and touch contaminated ground, Correa’s *Mano Sucia* campaign constructed a celebrity version of an Amazonian toxic tour, in which the person doing the denouncing had only that moment come to learn – in his or her (gloved) flesh – what contamination was. Indeed, in the spectacle of the campaign’s opening day, Correa was himself a celebrity denouncer; a tourist in his own country.

In this part of the Amazon, certain people are known for their willingness to speak publically about oil contamination. I met many such persons during my fieldwork, too many to include here: a nurse at a small clinic who routinely spoke of her experiences caring for sick patients; the mother of a teenaged girl diagnosed with leukemia whose house is next to a well; plaintiffs in the *Aguinda* lawsuit who had lost children after drinking contaminated water or who had miscarriages after washing laundry in streams that ran with production waters. What these figures have in common is the recounting of intimate experiences of harm, such as the death of a child or a loved one, in their testimonies.

Álvaro is one of these figures, famous locally for his decades long suffering from unexplained illnesses. Many present for the *Mano Sucia* event could have spoken of diseases

they attribute to contamination or of the many spills near their homes. Yet for the journalists, the visible lesions on Álvaro's body made him particularly credible in the context of the larger story about the *Mano Sucia* campaign. His body became physical evidence of his claims; his sores spoke more loudly than his words. But, ultimately neither he nor any of the other residents who had lived with oil operations were politically captivating enough to participate in the *Mano Sucia* campaign. Instead, celebrities – whose bodies had never known the effects of crude oil – made visible a reality that they only discovered upon arrival in the Amazon.

### ***La técnica del gato: Toxic Tours in Amazonía***

Following the filing of the *Aguinda* lawsuit in Ecuador in 2003, an increasing numbers of journalists, lawyers, and students came to Lago Agrio with questions about the case, asking to see the Texaco sites under dispute. Often, they were referred to the office of the Frente de Defensa de la Amazonía (FDA, Amazon Defense Front), the most prominent national NGO supporting the case. There they met Donald Moncayo, who had grown up in the first oil camp Texaco ever drilled in Ecuador, just outside Lago Agrio. Donald knew the area intimately. As a child he had watched Texaco's early operations. He knew which streams had been contaminated by spills and where old waste pits had been covered over. At first his activities were largely informal; if someone arrived with questions, he was frequently the person who volunteered to show them around. As he conducted more and more tours, this task became his vocation. One participant suggested the name "toxic tour," and that is the term by which these events are known now. Today, Donald's principal role at the non-profit Selva Viva is to run the toxic tours.

While he is paid by the organization as an employee, there is no fee charged for the tour itself. Participants are only responsible for paying the transportation for the day.<sup>1</sup>

The Aguarico 4 waste pit features frequently in the toxic tours as one of the principal modes by which outsiders have learned about the effects of contamination on life in the Amazon. Waste pits, spill sites, affected individuals, plaintiffs, old incinerated oil, gas flares – these are the materials through which Donald assembles toxicity for those participating in these events. More than just a vehicle for public education and environmental activism, one reason that the tours are so effective is that they enroll participants to be witnesses by providing an embodied experience of contamination.

I attended many of these tours. While each differed depending on the interests and size of the group participating (ranging from a single participant to several dozen) tours had many common components. Often a tour would begin with a recounting of the history of oil operations in the Amazon. Donald would indicate remnants of specific technical practices Texaco had used that resulted in contamination, while talking of his own experiences with spills and burning pits in the 1990s and would relate the history of the *Aguinda* lawsuit while leading the group to see waste pits, gas flares, and to visit the homes of people living near oil operations. To give a sense of these tours, I will present moments from two of the toxic tours I observed. I watched Donald use these same techniques on multiple tours. As happens here, participants are invited to partake rather than simply watch: to screw an auger into the soil; to skim crude onto the surface of a glove; to test their balance by stepping gingerly out on logs suspended over the semi-solid surface of a waste pit.

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<sup>1</sup> From 2011-2013, the standard fee to rent a vehicle with driver for the day in Sucumbíos was \$120. These fees are established by the taxi organizations.

### *The waste pit*

The Aguarico oil camp with which I opened this story is a 45-minute drive from Lago Agrio. Following the road past Dureno, you cross the Aguarico river on the cranky *Jenny Nepali* barge. Often it seems that the motor might putt out mid-current, leaving the rusty hulk to float sideways downstream, like a beetle abandoned on its back. On the other side of the river a recently paved road lined with billboards announces the benefits oil profits have brought: “*Petroleum builds roads to development*” [*¡El petróleo construye caminos hacia el desarrollo!*]. The Aguarico-4 waste pit is a frequent stop on these toxic tours because of its relatively close proximity to Lago Agrio. It also is an open-air pit that participants can easily access on foot without a long trek through the forest or past the industrial fences that enclose other sites.

We’re on a toxic tour with a group of high school students from a town 30 minutes west of Lago Agrio that, despite the pipeline that runs through its main road leading to Quito, has no oil operations. Leading the students through the brush to the edge of the waste pit, Donald pauses in the speckled light of the forest to tell them about the well we are visiting. Describing Texaco’s operational practices, he indicates the boundaries of the pit, which can be difficult to recognize at first because of the growth around its edges. Yet, with practice, the eye becomes accustomed to finding these overgrown rectangles in the forest. *This pit is about 3 meters deep*, he begins, as the students gather before him. *In 1974, Texaco drilled this well and operated it for many years until it later became dry. In the year 2000, PetroEcuador began to reinject the well with formation waters. This pit has been here for 37 years. Horses, animals have died here. 24 cows have died here. These pools are directly related to the problems you see here in the area.*

He picks up a long stick lying on the pit's bank propped against a tree. He has used this particular stick on many tours; the bottom several meters is stained black. Sometimes he has so many tours to conduct that he visits the Aguarico 4 several times a week. *This pit was never covered over. Texaco says that it is the responsibility of PetroEcuador. But Texaco built it, operated it. It was exclusively their fault. This is the territory of the Siona and Secoya and the Cofán. It killed off what they used to feed their people, it killed their animals, their fish. It killed their sumak kawsay.*<sup>2</sup>

*Look, he says, gesturing towards the pit, this is business. They didn't cover it over, they just dumped it here. They saved a huge amount of money by doing it this way. He begins to explain the allegations of the Aguinda lawsuit and cites the Cabrera report that put total damages at \$27 billion. But this report was so heavily attacked for more than two years that the judge said he wouldn't rely on it in his final decision. So then the court hired another expert. But there are always things that the experts don't take into account. For example, before, Texaco always put oil on the roads. They lit pits like this on fire. There were columns of smoke that you could see forever. There were two planes at this time, one that was Texaco and one that was CEPE [the first Ecuadorian national oil company]. These planes would fly through the columns of smoke – pilots said that up in the sky the columns of smoke formed pyramids, joining together. Today it's illegal to burn oil pits like this. Donald steps onto the surface of the pit, sustaining himself on suspended fallen tree branches. Who wants to walk on the pit?*

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<sup>2</sup>*Sumak Kawsay*, or *el buen vivir* in Spanish, is the Kichwa concept of 'good living,' which has been adopted into Ecuadorian political and popular discourse in recent years, most notably in the 2008 constitution. *Sumak Kawsay* implies the possibility for a full life within a community and natural environment. *El Buen Vivir* is both an institutionalized term of the Ecuadorian government as well as a means for civil society groups to express alternatives to development within a pluricultural nation (Gudynas 2011; Acosta 2009).



After illustrating the pit's depth by inserting and removing the crude-covered stick, Donald leads the group down the hillside to a small stream. In the tours he stresses the ways that the company's technical practices spread contamination through anecdotes that illustrate how he and others encountered pollution in their daily lives. He emphasizes to participants not just that these waste pits still contain crude oil, but that contamination has migrated beyond their boundaries – a disputed fact of the *Aguinda* lawsuit.

Arriving at the bottom of the forested embankment, we find ourselves at an unremarkable stream. Donald tells the group that this stream is also contaminated with oil. The water moves past us, muddy and slow. It is completely shaded but stubbornly hot. *Sometimes Texaco says, 'We're going to show you how those plaintiffs are lying – look, the water is clear' they say. But once, when we were here, Pablo [Fajardo] took a stick and stirred the water – like this – he digs a stick into the muck at the bottom of the stream, moving it around in a circle. And look, there it is – bubbles of oil rise to the surface, opening an iridescent bloom across the top of the water.*

Pulling a plastic glove from his back pocket, he puts it on and then with his gloved hand skims the water's surface. Oil sticks to the glove, staining his hand black. He holds it up to show the students on the bank. *People assume there is no oil here because it sits down below in the mud [and you can't see it]. But everyone downstream is drinking this. Texaco said that it was impossible to test this water, but it's not impossible. Once they took a fish that they caught here, they dried the fish, they ground it up, and they sent the powder to the laboratory for analysis. They found that the fish contained heavy metals.*

The water shines behind him, as he stands with one foot in the river, and the other propped up on the bank. Some students take pictures with their cellphones; others fidget in the heat. Donald continues: *When the people come out to protest, they send the military. Everything*

*in the Amazon is divided now – by oil blocks. If not for oil, then for mining. There is a lot of mining in the area where you all live, that’s why you need to be prepared. I’m not proud of this, it causes me great shame that as Ecuadorians we weren’t capable of protecting our land. This is ours, not for people to come and dump things here. We just passed a spill by the side of the road on the way here. That happened a few months ago. That was PetroEcuador. This keeps happening.*

Although Donald always includes a visit to an open pit, many pits have been covered over – either through remediation programs or topped off with soil. The covering of pits illustrates what he calls the “the technique of the cat” [*la técnica del gato*]: bury your waste with a handful of dirt and don’t look back. *No offense to cats*, he says, *I don’t want to insult cats by comparing them to Chevron*. Humor is a frequent element of these tours, a rhetorical technique that both engages audiences and allows Donald to point to the absurdity of such environmental disregard. Cat humor in particular was a recurrent means of poking fun at oil companies: another metaphor I heard Donald and others use to describe an oil company that was feverishly fighting back allegations of wrongdoing was “*como gato, patas arriba*” [like a cat on its back].

These tours convince through experience. It is one thing to stand on a grassy surface and be told that underneath is a pit 20 by 30 meters in diameter, and 3 meters deep. But it is another thing entirely to stand on the edge of one, next to an area the size of a swimming pool, and see the crude yourself. To watch as Donald submerges a long branch that keeps disappearing downward before hitting bottom. To smell the oil in front of you, to see its luster when Donald rakes the bottom of the streambed or you flip over a leaf with your boot to find the bottom coated shiny black. Probing a waste pit with sticks or mucking a streambed to prompt crude to bubble to the surface make contamination real to visitors on a toxic tour.

### ***The Auger***

Another group, another tour. Donald leads the group across the cleared area of a platform, crossing over the lines of tubes that connect the storage tank to the ubiquitous pipelines that follow nearly all Amazonian roads here. The suspended pipes are wobbly– giving beneath your weight just enough to make you wonder if they might rupture. Lean your ear close enough and you can hear the contents hissing by, the pipe hot to the touch. Just beyond the pipelines, on the other side of a low bank, lies an old pit. An abandoned gas flare sits towards one end of the pit, a rusted triangular configuration of pipelines used to burn off excess gas produced from the well.

The pit is overgrown with dead grass and pond weeds, the pooled water tinted here and there with the blue sheen of oil. The visitors are lined up along the pit's bank, as though standing along the steps of a makeshift amphitheater, with Donald below. The pit has been covered over with dirt, so it is firm enough to stand on. Picking up the auger, an essential implement of the tour, he announces: *Here I am going to go down one meter deep to start to take out what is hidden below. You all will realize what it is when you see it.*

An auger is a simple tool used for taking soil samples. It has a T-shaped body, with extendable lengths that can be added to the middle for deeper samples. At the end is a hollow encasement that holds the core sample, with a sharp pointed end. The auger screws clockwise into the mud, scraping rocks, and sucking reluctantly as Donald pulls out the first mud core. Knocking the auger on the ground, he dumps out the surface mud and screws it in deeper. Inspecting the second core, he looks up: *Get your noses ready, the oil is about to come out.* Less than a meter down, the cores of mud begin to take on a dark tint. He removes a clump of mud,

and with gloved hands passes it off to the student on his left. The students lean in to inspect the mud. *You can smell it from all the way over here!* says one, reluctant to get closer. Donning gloves, the students pass the mud around, smashing it between their fingers, holding it up for friends to smell or take pictures of. The mud is black and iridescent, glinting in the light.

Taking out an old five-gallon water bottle, Donald cuts it in half with a machete to form a makeshift bowl. *Now this you can see, he says, is clear plastic. And the water here is clean too.* Picking up a clump of mud taken from the pit, he drops it in the water, mixing it until it dissolves. The water turns a dark black, leaving a rainbow stain as it sloshes up the sides of the bottle. The students lean in to see closer. With a clean, gloved hand, Donald skims the surface of the water with his palm, holding it face out to the students. The glove is black and shiny with oil. *This, he says, is the remediation done by Texaco.*

The auger is a tool for uncovering what lies below now covered-over pits; of excavating, as an archeologist might, the material remains of Texaco activities. As he holds out the oily mud for inspection, Donald states: *This is the discovery of the lie told by Texaco [es un descubrimiento de la mentira de Texaco]*. The act of screwing the auger down and pulling up oily mud for participants to examine is continually to ‘rediscover’ – as though for the first time, for audience after audience – the contamination. Participants unearth for themselves the crude oil that Donald mobilizes as evidence of his narrative, thus enrolling them in the experience of harm in the toxic tour.

This use of an auger in toxic tours mimics scientific and legal techniques for producing evidence of contamination in the *Aguinda* case, in which experts also used augers for sample collection. But these soil samples won’t travel. They won’t be carefully bagged, labeled, or taken to a lab to be measured for TPH, HAPs, pH, salinity, or heavy metals. They won’t be compared

to other mud samples, or written up as part of a scientific study or a legal complaint. In the toxic tour, the iridescence, an acrid smell, the consistency of mud squished between fingers, serve as evidence of contamination. Through techniques that allow participants to see, smell, and touch the blackness, the slickness, the smelliness of crude, harm begins to take form. Witnesses are enrolled through sensory experience.

While toxic tours like the one Donald leads do not share a lineage with the North American Environmental Justice movement, the Amazonian toxic tour is not far afield. In the late 1980s, peasant farmers in Sucumbíos and Orellana began to organize to address the region's political and economic marginalization, demanding land titles, better roads, and social services. Oil development was largely unregulated and state social investment in the region was conspicuously absent despite the growing population of settlers. Concerns of residents, activists, missionaries, and others and were mounting about environmental contamination from the innumerable oil spills and routine dumping that characterized the first two decades of the industry. One of the groups born out of such community organizing was the Frente de Defensa de la Amazonía (FDA), founded in 1994 in part to respond to the call for civic support put out by the plaintiffs of *Aguinda v. Texaco*.

When *Aguinda* returned to Ecuador in 2003, the trial began to gain traction as a result of advocacy work by both plaintiffs and by environmental groups such as Amazon Watch, Acción Ecológica, Rainforest Action Network, and the FDA. Much of this work emphasized the fact that Texaco was a US corporation. Groups argued that Texaco had made cost-saving decisions in their operations in Ecuador because they believed it to be a place beyond the rule of law, decisions that the company would not have made if operating at home. Advocates for the plaintiffs framed the case through a critical analysis of disparities of power and wealth between

the United States and Ecuador. The toxic tour provided a space in which the plaintiffs could show outsiders how their crops had been contaminated, explain what a waste pit was, or have visitors smell the remnants of burned tar on their land. It was a means to give voice to the innumerable commonplace ways in which oil operations had affected individual people. In the past decade, the toxic tours led by Donald have evolved into a principal means to tell the plaintiffs' stories to outsiders.

The toxic tour that Donald leads implies a critique of the relations among power, pollution, and justice which extend beyond the Amazon. Donald draws attention not only to the enduring presence of contamination in a particular place, but also maps the paths by which toxins travel through anecdotes and personal knowledge of this place: which river this stream connects to; the family who lives a few kilometers downstream that became sick and had to move away in search of medical care; the products grown in contaminated Amazonian soil to be sold in national and international markets. This tour, like others documented in environmental struggles, articulates the intimate details of immediate struggles with a broader political economy, highlighting the material patterns of pollution and injustice for those who live in oil producing regions (Pezzullo 2009, 23). Donald's toxic tour, highlighting the details of daily life in an oil producing region – the number of farm animals lost by falling into uncovered waste pits, or the stories of those who have been affected by contamination over the years – combines personal and anecdotal knowledge to denounce the legacy of oil pollution in the region that is his home. Such work makes it possible for visitors whose lives are geographically and culturally distant from the Amazon to relate to the significance of Texaco's practices, forging a space of connection.

As in any job, Donald has developed a repertoire of tools (the auger, glove, stick, plastic bottles) and places (Aguarico 4, Shushufindi 61, among others). As more and more people have gone on Donald's tours, his techniques – such as using the auger to extract oiled soil or the gloved hand to skim the water – have been disseminated through photographs and written accounts and become markers of the tour. Perhaps the most iconic of these is the crude-covered hand held up as proof. The gesture, repeated in hundreds of toxic tours, has been captured by journalists and photographers. Donald's picture, face out of focus and obscured behind his black hand, regularly accompanies articles in newspapers and magazines and has made countless appearances on activist websites and blogs. The hand makes contamination visible for the camera.

Growing up in the Lago oil camp near the first wells drilled in the Amazon, some of Donald's earliest memories are of tremendous clouds of black smoke billowing from burning waste pits, of laundry hung outside turning black. As a child, he would walk to school barefoot on the hot pipeline in order to avoid ruining his shoes on oil-slicked roads. He remembers countless times that his family's crops were lost after oil spills, or that he found farm animals suffering or dead after drinking contaminated water from nearby streams. Donald relates how, when he was 13, his mother passed away from acute toxic exposure after washing laundry in a stream contaminated by a recent spill of production waters near his house. Taking over responsibility for the family farm with his siblings, he saw his community divided by disputes over land, jobs, and spills – first with Texaco, then with PetroEcuador. Today, living across the street from an oil flare that burns 24 hours a day, he continues to live with the persistent fear that the air his family breathes might one day make them sick.

When Donald raises his oiled hand for viewers, he draws on a lifetime of experiences such as these in order to counter Chevron's claims that there is no longer any hazardous contamination from Texaco operations. By holding forth his hand for inspection in the performance of a toxic tour, he mobilizes his body as both an object of evidence and a source of authority (Schaffer 1992). It is a gesture of perception that draws its authority as a truth claim from his position as a resident of the area, as a plaintiff in *Aguinda*, and as an activist with the FDA. Donald's oiled hand is historically connected to this place, and assumes a moral stance on oil production and the history of international oil companies in Ecuador. Interpreting the oiled hand as a form of gestural knowledge – an experimenter's knowledge that can only be communicated through active participation and the work of *doing* (Sibum 1995b; Sibum 1995a) – the display of the oiled hand is an evidentiary practice that mobilizes the body as a knowing instrument. The authority of the claim when performed for a group of onlookers derives from the bearer's experience of daily practices of exposure at particular sites, such waste pits (Schaffer 1997; Schaffer 1992). The hand, an extension of the body, is a delicate instrument of touch and sensing. Donald's gesture of the dirty hand makes its claim to truth from a position of intimacy, knowledge, and exposure.

*Naturalizing contamination: 'Like an idiot you take off your clothes'*

Several kilometers down the road from the Aguarico 4 well is the town of '12 de Febrero'.<sup>3</sup> Two towering gas flares sit at the corner of where an access road meets the main road; settlers created a soccer field in the dusty flat space beneath them. With flares rumbling overhead

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<sup>3</sup> Fictional name. Many towns and streets in Ecuador are named after historic national dates or the date of their founding.



(gas flares are incredibly loud!) and the dusty field illuminated, families would gather in the 1980s and 1990s to play soccer at night. This is where Álvaro lives.

I had heard of Álvaro prior to the interview I was present for at the *Mano Sucia* campaign. Several interlocutors had spoken to me of a schoolteacher who had been made ill by contamination. Each told me he would be a good person to speak with. Sometimes Donald's toxic tours would make stops at the homes of Álvaro and others so that participants on tours could hear first-hand accounts from a range of individuals who had been affected by contamination. Intrigued by what I had seen on the day the *Mano Sucia* campaign began, I followed a series of contacts to seek him out in 12 de Febrero for an interview. He received me generously at his home.

I return to Álvaro in order to recount part of the story that he told to me that day. Contrary to the celebrity witnesses in Correa's *Mano Sucia* campaign who showed contamination by holding up their gloved hands, Álvaro exposed his unprotected body to illustrate the effects of exposure to toxins. As already seen, the journalists in the audience were principally attuned to the denunciations of these celebrities who participated in the campaign, but were curious about Álvaro because his visible lesions lent proof to the larger claims the campaign made. In other words, the celebrities were the headline event, and Álvaro was newsworthy insofar as his body corroborated their claims. If it were not for his the visible manifestation of exposures to toxins in the flesh, it is unlikely they would have interviewed him. But the attention to his sores within the setting of an event where Correa and subsequent celebrities denounced the contamination had other effects besides documenting his story. Zoomed-in lenses focused on his peeling skin. His verbal testimony was secondary – even inconsequential – to the visual traces on his body. While celebrities index contamination through

their outstretched hands and indignant words, Álvaro's body is presented as toxic nature itself, naturalizing the manifestation of the effects of exposure to contamination in particular bodies and not others.

Álvaro arrived in the Amazon at age 28 to assume the post of schoolteacher. Having moved from the *Sierra*, he was unfamiliar with the landscape of oil. What he told me began in a way familiar to other narratives, in which an abundance of contamination in the places he lived foreshadows the development of his health problems.

Everything was covered in oil; it stained the shoes, clothes, and we would walk – there were very few cars, we would walk and there would be all these bad smells. Out in the sun your body would burn, and it was, well, a toxic environment.

Initially, he had been sent to an assignment on the Napo River, downstream from the developing petroleum centers of Coca, Sacha, and San Carlos. But contaminated waters from upstream operations flowed by in the rivers next to his new home. He felt the effects in a matter of months.

Since there weren't any water wells ... we'd drink the water from the river. We'd cook with the water from the river. We'd wash with the water directly from the river. And you'd see small particles, or stains of black in the water, surely oil. And so then, after 6 months of working as a teacher there, I got sick. The same sickness I have today. And as you can see, my body is covered with sores.

Requesting permission to move closer to a health center so he could obtain care for his growing medical concerns, he was relocated to 12 de Febrero. Unbeknown to him, moving closer to roads, electricity, and health centers in the urbanizing areas of the Amazon meant moving closer to oil operations. When he arrived in 12 de Febrero, where he has made his home since, there were already over 20 wells in the community.

Álvaro pauses to roll up his sleeves and pant legs to display the sores on his calves and forearms before continuing to speak.

I have to receive treatment constantly. So I started traveling further downstream to El Eden and then to Quito, Guayaquil, Cuenca, Shell, looking for medication and nobody knew what it was. And even today they tell me they don't know what it is. It is spreading all over.

Reaching across the kitchen table, he took a plastic basket containing pill bottles, pointing to the names of the medication on the labels.

So since I started getting sick up to today I've never had a cure. Treatment, yes, but it continues to affect me. I take pills that are for cancer, [I take them] two times a week to maintain myself. Two on Wednesday; two on the weekend. So with these I get by, plus the creams I put on, but it never stops. It never goes away. It has affected my adrenal glands, my stomach as well, and my lungs.

In the end, what I would wish most is to have my skin strong again and resistant. My skin is like the skin of a tomato – but I think that a tomato skin is stronger. Any kind of bump, or if I run into something, it breaks open. And the worst is when I get [lesions] on the groin and the face, I get [he makes a noise like skin blistering – *chup chup chup*] and it hurts.

Like others, Álvaro speaks of how he and his family used to bathe in the streams near their homes, without realizing the extent of or hazards posed by contamination. His critique of Texaco is pointed, noting that while the company operating currently is “no angel,” operations have dramatically improved in comparison to the early decades.

What the Texaco Company did when they operated here is heartbreaking because of the formation waters, the spills they caused, the lack of treatment, no cleanup; they just used the environment as though it didn't belong to anyone. People came [to the Amazon] to get their farm, to get out of poverty, and they thought that this was normal that nobody did anything. Then afterwards we realized when people started to get sick, when people started suffering from strange diseases...

In this area no one insists, no one sees, there's no newspaper or press, nothing.

It's deserted here ... This oil exploration that the company did was completely inhumane, un-environmental; they only thought about how much money they were making, of profit, and it has to be said that some of the authorities from here were complicit. Today, we are seeing the consequences. Because people who are younger than 50 years of age are dying of strange diseases.

From his position as schoolteacher, Álvaro describes the relationship he perceives between children's proximity to oil operations and their performance in school. These are the sorts of connections that would be rejected out of hand in official forums without an epidemiological study. However, my task as an anthropologist is distinct from that of an epidemiologist or court-appointed expert. I draw on them because they inform an understanding of the interwoven relations between place, oil contamination, and health and sickness among residents in this community.

Álvaro: There are children who are disabled, children who have malformations, children who don't perform well [in school].

Amelia: So you see a connection between the kids who bathe in the rivers and those who don't do well in school?

Álvaro: Yes, clearly, we see that. Also those who live next to the station. There are spills there. They live right next to the station ... and the kids have problems learning. Those who don't live as close they have fewer problems. Those who live right next [to it] have more problems. It seems to be from the contamination.

Álvaro locates his own poor health in a long list of people who have suffered, many of whom he notes as having died from cancer.

There was a woman who died from having her feet rot off. Nobody knew what it was. And she died. A mother of a family, she was a very happy person, always dancing at parties ...

[He gestures in the direction of another neighbor's house]

Their daughter died, she was 3 years old, with cancer. Over here, Don Gonzalez died, where the spills are – 3 spills. Over here, Don Larrea died, also from cancer. The Señora Alvarez with children also died with cancer. This neighbor [over here] had two daughters who died from unknown diseases, probably cancer, they didn't even know what from. As well, Señora Bastidas died with cancer. Señor Romero, a man of my age, died from cancer. He left here for Quito, healthy, and when he came back, he came back as a cadaver. That is to say, he never came back.

Of the cases I have seen, more than 15 people have died from cancer in [12 de Febrero]. If we were to go up to well #28, there are various other cases, where women have fallen in the pits trying to save animals [that had fallen in]. And there are other cases where people won't even speak about [what has happened.] ... People are desperate. People who are sick who don't even know where to go, or where to begin, or who to ask. Practically speaking, in my case, we barely have enough for food.

Álvaro is known locally not only for his health problems, in particular because of the graphic, visible nature of his sores. He is also known for his willingness to entertain the questions of visiting reporters, students, and anthropologists as they seek him out for interviews or bring visitors to his house to hear his story. Yet, despite his blistered skin and account of repeated exposures to toxic chemicals, ultimately, such testimonials offer him limited recourse for obtaining health care or clean water to meet his family's daily needs. His willingness to tell others about what happened in the Amazon has led to little change:

What is the information for? That is what all my friends, my spouse, neighbors say. ... My *compañeros*, they say to me, 'Like an idiot you collaborate. Like an idiot you take off your clothes, like an idiot you expose yourself, it's time for them to help you. They come from all over the world, and they make money off these interviews, with these videos, and you, you're just being used.'

Álvaro is gentle in his critique of those who come to talk to him – including myself – some of his neighbors less so. This sense of frustration and indignation, at times bordering on suspicion of foreigners who come to do an “investigation,” or of journalists who come to write yet another story, was often palpable during fieldwork. Some residents, in particular those who had been interviewed repeatedly for their role in founding Lago Agrio, or others who had become known

for a particular spill on their land, declined interviews. Others, willing to be interviewed, were quick to remind me that they had spoken about these issues many times before – *even on television in Quito* – as one farmer said. *What has come of all of these testimonies?* For many interlocutors the recurrent scientific investigations, photo essays, written accounts, and interviews are yet another extractive practice, by which foreigners profit from others' suffering. Their critiques reveal not only the limits of ethnography, among other techniques of investigation, but the complicity of even well-meaning interventions to speak for the harm others endured.

Ultimately, Álvaro welcomed the arrival of Correa and celebrities, noting that perhaps their presence would result in greater public reception of the suffering here.

I say, you have to say what you feel, you have to speak the truth. And hope that your children don't suffer what you suffer. And hope for justice one day. Because we don't take anything from this world, but yes, I would like some help. Like in the US, they say there are very good doctors. That just with a few creams they can cure you ... It's been 18 years and I've never had help. I live sick, just here for giving testimonies.

The issue of remuneration is thorny. Álvaro and his family, like his neighbors and so many people who live in this region, are poor. Yet his testimony derives authority in part through his offering of the account without perceived coercion or payment. If the *Mano Sucia* campaign had, for instance, compensated Álvaro for speaking at the inauguration, his role as witness to contamination would likely have been perceived by journalists and viewers alike as compromised. Indeed, when it was leaked that celebrity participants Mia Farrow and Danny Glover had been paid \$500,000 (combined) by the Ecuadorian state to fly to the Amazon and denounce Chevron (Markay 2014), the validity of their critique of the company was broadly

called into question.<sup>4</sup> In order to be credible witnesses, the testimony of Álvaro and other residents, must be seen as being unmotivated, i.e., unpaid.<sup>5</sup>

His body is a resource that Álvaro mobilizes to testify, to offer evidence of his suffering. Claims of illness resulting from exposure to oil contamination are mediated through embodied performances such as the moment on the Aguarico-4 well platform, or in the hours that we spent in his home in 12 de Febrero. But the body is invoked differently in denunciations of contamination depending on the witness's position. The celebrities invited to participate in the *Mano Sucia* campaign use their hands to discover and denounce publicly the reality of contamination. Their performances were a spectacle because of their surprise at experiencing contamination in the flesh. Yet, in Álvaro's informal testimony for the journalists, his body was mobilized differently. His body – disassociated from his person and story through the zoom of camera lenses – was evidence of damage wrought by contamination, and his words were secondary.

To be the object rather than source of vision is to be evacuated of agency (Haraway 1997, 32). If the modest witness of the 17<sup>th</sup> century was credible because his body was invisible as an unmarked, white, elite, male 'gentlemen' who could conveniently occupy the space of bearing the 'culture of no culture' (Shapin and Schaffer 1989; Haraway 1997), the Amazonian resident's

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<sup>4</sup> These critiques of the "compromised" testimony of celebrities are interesting given that the celebrities were not speaking from a position of expertise but rather from their own social platform. Nonetheless, even for celebrities, payment for their participation was seen by many as undermining their validity.

<sup>5</sup> Limited socio-economic resources make families like Álvaro's especially vulnerable to repeated exposures to toxins. For instance, families with enough financial resources can purchase bottled water for drinking and cooking, have the opportunity to move further away from oil operations, or seek health care. What I suggest here is that those who are most vulnerable to contamination are also those who are least equipped to mitigate that burden financially. A politics of witnessing that requires unpaid testimony from those who have suffered the most from oil operations deserves pause.

credibility as witness is reduced to corporeal proof. Compared to the invited celebrity witnesses, Álvaro has little recourse – he has few economic resources, and no political position to speak from. His body serves as the principle way he can make claims that are recognized as legitimate by media.

What makes Álvaro's lesions so readily legible to cameramen and onlookers? Why is his skin arguably of highest interest, better proof of Texaco's malfeasance than his story? In *Aguinda* there have been routine allegations of corruption; words appear to be easily bought. In the coverage of the *Mano Sucia* campaign, Álvaro was ultimately a marginal spectator in comparison to the celebrity speakers. His marginality begs the question: why was his body recognized as an authoritative form of proof, while his story could not compete with celebrities' surprised encounters with the crude waste pit? Why were foreigners seen as better positioned to speak for him and other Amazonian residents who live alongside oil operations? What is the relationship between the testimony configured through words and testimony configured through bodily experience?

In her account of asylum seekers in France, Ticktin (2011) explores the construction of the morally legitimate suffering body as the object of humanitarian intervention. In her work, she illustrates the ways that medical and scientific techniques apprehend bodies in order that an individual seeking asylum can be seen as worthy of humanitarian exception in order to receive legal residence papers. Ticktin notes that the suffering body is frequently the racialized, gendered body of the global south. Response to such bodies is morally mandated by their physical suffering. But this renders suffering subjects as Other, a mere body that is best spoken for rather than a witness who can speak (Ticktin 2011, 15–16). Returning to the interview with Álvaro on the day of the campaign, perhaps what is most revealing about *Mano Sucia*'s appropriation of the



toxic tour is a politics in which celebrities (predominantly foreign, but always individuals who are not from the Amazon) are invited to denounce harm that is alien to them, while those who have lived with contamination and suffer its effects are only spoken for – their bodies exhibited as proof of what others have to say.

While Álvaro lifts his clothing to reveal the lesions on his body to demonstrate harm, the celebrities use their hands to indicate contamination found in nature. Likewise, while participants on toxic tours use their senses to see, touch, and smell contamination, their skin is safe, enclosed in gloves, in contact with contaminants so fleetingly that they run no significant risk of toxic exposure. These hands do the work of pointing to toxins in a place they should not be. While some bodies become instruments to point to or apprehend toxins *in* nature, other bodies are only authoritative as a form of toxic nature for apprehension by cameras and onlookers. Both emerge as witnesses to contamination, yet only one must reveal himself to speak to truth. It is precisely those bodies that bear undue toxic burdens in the Amazon.

## **THE ‘DIRTY HAND’ OF OIL: EXTRACTION AND THE FUTURE IN ECUDAORIAN ENVIRONMENTAL POLITICS**

### ***The Aguarico-4, new meanings***

I opened this story on the banks of the Aguarico, imagining through the words of engineers and early colonists the drilling of the Aguarico-4 well. In the half century since, Texaco has come and gone from Ecuador. Lago Agrio has become a major Amazonian city, no longer just a pair of straw shacks on an oily road. Nearly three generations have grown up here now that have only known life in an oil-producing region. The *Aguinda v. Texaco* lawsuit has also concluded, although its disputes and legacy carry on. Today PetroAmazonas and Andes Petrol are some of the biggest operators in the region, their oversized trailers loaded with precarious stacks of pipeline or drilling equipment careening around the curves of the road that runs from Lago Agrio to the Quito.

The Aguarico-4 well encapsulates much of the story of oil in the Amazon, from drilling in the 1960s through its production and abandonment, to its emergence as a site of disputes over contamination in the Judicial Inspections and its starring role in Donald’s toxic tours. Aguarico-4 persists in controversies over oil and its effects; its open waste pit is an object of intervention, a symbol of struggle, a reminder of what this place looked like just a few decades before. In 2013, as my fieldwork was coming to a close, the Aguarico-4 was once again reincarnated, this time as the backdrop to the media campaign inaugurated by President Rafael Correa as described in the previous chapter.

The Aguarico-4 waste pit is a productive site from which to explore the ongoing tensions over oil operations and the future of extraction in the Amazon. By contrasting the history of this site with Correa's opening of the *Mano Sucia* campaign and the end of the Yasuní-ITT campaign, I illustrate what is at stake in the making of harm in contemporary Ecuador. The oiled hand, as an extension of the body and an index of situated knowledges made through daily life in this place, has become a central vehicle to make harm visible. Yet, what the hand makes visible through its appropriation in the presidential campaign, and its ubiquity in social media, depends on the bearer.

Correa's justification of the Yasuní-ITT initiative's end relied on a numerical quantification of potential damages in order to rhetorically bound the effects of oil operations, similar to the calculative rationalities employed in the EIA and state regulatory apparatus. Correa's expansion of an extractive agenda has prompted widespread critiques by environmentalists and activists, who have suggested that the government's hands are just as dirty as Texaco's, pointing to the relations of toxicity that extend from one company to another, and from the past into the future as harm unfolds. In the midst of these entangled histories and practices, what harm *is* does not necessarily become any clearer. Rather we see that practices of making harm real are not only contingent, but at times complicit in concealing some toxic relations at the expense of others.

Let's go back to the 17<sup>th</sup> of September 2013. When we last saw him, President Correa was balanced on a felled log suspended over 3 meters of old crude oil at the Aguarico-4 waste pit. From that perch, he addressed a much larger audience than those assembled there:

Ecuador, Latin America, the whole world: This is one of the great lies, the arrogance of those transnational companies that believe that with dollars they can destroy countries, that they can destroy the jungle, that they can destroy life. This is 30 years after Texaco, now Chevron, says that they remediated what they damaged, what they never should have damaged in the first place ...

There are around a thousand pits like this one in our Amazon that were never remediated ... Other [pits] they covered with a layer of dirt in order to trick the Ecuadorian state, the people of Ecuador. This is the greatest, or one of the greatest, environmental disasters in the history of the planet. It is 85 times worse than the British Petroleum spill in the Gulf of Mexico, 18 times worse than the Exxon Valdez spill off the coast of Alaska ...

We are going to show the world the lie of Chevron, once Texaco. We are going to show the world the dirty hand of this oil company.

With that, President Correa knelt down to stick his gloved hand into the black slop. Sticky and mixed with fallen leaves and debris, the oil clung to his gloved hand. Rising, he thrust his right hand outright, fingers spread and palm open, to the journalists and government officials crouched on the opposite bank.

To demonstrate to the President the dimensions of the pit on which he stands, a young man from the region is brought out. He steps onto the surface from the far side. With each step, the pit reels beneath him, rising in dark black waves that never crest. Decaying crude oil is at once liquid enough to undulate, yet solid enough to sustain the weight of the man as he lurches across to the President. Stopping behind him, the man reaches down, *barehanded*, and punches the fern-covered surface, emerging with a handful of crude that he holds high above his head. He extends his hand outwards in the same forthright gesture, several meters behind the log where President Correa stands. The crowd cheers.

Not to be outdone, President Correa removes his crude-covered surgical glove: "Just as the compatriot here muddied his hand, I also will muddy mine. As our compatriots have muddied theirs for decades." The crowd whistles and claps as Correa repeats the same action he

performed before, but this time with no barrier – symbolic or synthetic – between his hand and the crude. Shouts erupt: *Bravo, Presidente!* President Correa waves his bare hand covered in oil for the cameras:

For what our Amazon has lived through, our communities, throughout decades of exploitation by this company. We are going to use against this arrogance, those millions [of dollars], those transnationals, Chevron-Texaco, the most lethal weapon ever invented: the truth. Here is the truth, fellow citizens. To the whole world, here is the truth of Chevron-Texaco.

Why was it necessary for Correa to repeat the gesture and dirty his hand twice in order to affirm his commitment to the Amazon? The exposure of his bare hand is a telling gesture in Correa's tenure as president: when his commitment to the nation is challenged, he offers his own body as sacrifice (de la Torre 2011). The history of oil's past continues to reverberate in debates over the future of extraction, the Amazon, and the nation.



*Figure 31 Correa waves his crude-covered bare hand at the crowd from the Aguarico 4 waste pit. The man brought out to demonstrate the dimensions of the pit is pictured behind him, while Paola Carrera of PRAS steadies the rope. Photo by Mitch Anderson, 2013.*

This unusual moment at the Aguarico-4 oil pit initiated the “*La Mano Sucia de Chevron*” (“The Dirty Hand of Chevron”) campaign. The campaign began at a critical moment in Ecuadorian environmental politics. Just one month prior, Correa had announced that the Ishpingo-Tambococha-Tiputini (ITT) block of the Yasuní Wildlife Reserve would be opened to drilling, ending the Yasuní-ITT Initiative. The initiative, which began in 2007 under Correa, had proposed to combat climate change by leaving 850 million barrels of heavy crude oil in Amazonian subsoil in exchange for 50% of its potential revenue (valued at \$3.6 billion) from the international community. With the span of a month, Correa launched an international campaign

to denounce the history of Texaco in Ecuador with one hand, and opened the door to oil extraction in one of the most bio-diverse regions of the world with the other.

The blackened hand condenses multiple natural and national bodies: sufferer and perpetrator, nation and corporation, Amazon and human body. The oiled hand as a symbol draws its power from layered histories of nation and nature. Hands are rich and complicated objects with multiple meanings. The performance of the oiled hand originates in knowledge based on daily practices of proximity and exposure to contaminants. While we each have a relation to oil as a substance that sustains our lives, these relations are not symmetrical. The bearer of the hand implicated in the assertion of contamination and the making of harm, illustrating the ways in which certain bodies always bear unequal burdens of the harm brought by oil extraction. The hand suggests complicity and makes visible the bearer's dependence on extractive economies as well as his or her position in relation to contamination. Correa's hand that denounces is thus defined by the hand that endorses continued extraction in the Amazon; bodily practices of engagement with contamination tell us as much about harm as they do of those involved.

### *Origin of the oiled hand*

Let's recall the moment in the forest on one of Donald's toxic tours. A moment repeated in every toxic tour I attended, Donald skims the surface of a body of water with a gloved hand, and then extends it forward, palm open, to participants. The blackened hand makes oil visible. When oil comes into contact with water, its heavier particles sink and settle into the soil. In moving water such as streams or rivers, surface water may appear uncontaminated; yet when disturbed the soil or mud below releases hydrocarbons that may have been there for decades.

Donald skims the surface in order to collect the oil in a visual reduction as it floats by: the oily hand makes present the sedimented history of contamination below.

As shown through the previous chapter, in the past decade in Ecuador the oiled hand has become a symbol of the harm produced by oil operations. Extracting the gesture from the advocacy context of the “toxic tour,” the campaign manipulated it to bury the state company’s own dirty environmental record as well as the failure of the Yasuní-ITT initiative by ‘exposing,’ once again, Texaco’s legacy. Yet, the oiled hand is not merely a cynical appropriation of the toxic tour, because of the commitment Correa’s act makes to the harm that the people of the Amazon have suffered from oil.

To reiterate, Texaco’s departure in 1993 did not mean the end of oil extraction in Ecuador. Following the company’s exit, production expanded under PetroEcuador and PetroAmazonas. Other multinational corporations such as Repsol YPF, Andes Petroleum, Agip, Petrobell, and PetroOriental also began exploration and drilling. These operations largely continued using the same technologies as Texaco-CEPE and with no further regulation until the mid 1990s. Brought to power with the help of widespread support from environmental and progressive groups, since his 2007 election President Correa has framed oil extraction as necessary to underwrite national development. Underscoring the need for environmental regulation and state of the art technology, Correa has advocated for the development of natural resources to fund social investment and infrastructure programs, such as the building of schools, roads, bridges, and hospitals. His presidency has been characterized by a mode of technical expertise combined with moral righteousness that has been increasingly challenged by his reliance on extraction.

Despite Correa’s continued emphasis on oil production, plaintiffs in the *Aguinda* lawsuit



have received notable official support from the Ecuadorian government in their allegations against Chevron.<sup>1</sup> Correa has been one of the most outspoken political figures on the case. The documentary *Crude* (Berlinger 2009) documents Correa's visit to part of the former Texaco concession in the Amazon where he affirmed his support for the plaintiffs after smelling a resident's well water that was contaminated with oil. In his weekly Saturday talks (*sabatinas*), the President has frequently called for Chevron to clean up contaminated areas of the Amazon. The relationship between the Correa administration, national oil production, the history of past oil production, and the *Aguinda v. Texaco* lawsuit has been convoluted.

### ***Yasuní-ITT Initiative, oil, and national development***

Fifty years after the advent of commercial oil development in this region, both the industry and the future of the Amazon are more hotly contested than ever. Ongoing oil operations, African palm plantations, logging, colonization, and road building, in conjunction with a growing recognition of the ecological precarity of the region, have heightened concern over environmental contamination and deforestation. In 1989, a 9,820 km<sup>2</sup> area of forest was established as the Yasuní National Park, a UNESCO Biosphere reserve on Ecuador's eastern border with Peru. Located where the Amazon meets the Andes on the equator, the area is marked by extraordinary biological and cultural richness (Finer et al. 2009), making the Yasuní park one of the most biodiverse places on the planet. The species richness in amphibians, birds, mammals, and plants are highest for all of South America here. The Yasuní is the only place where all four forms of life intersect in this way, creating a "quadruple richness center" of mega-diverse forest

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<sup>1</sup> In 1995, the plaintiff lawyer Cristobal Bonifaz and his team signed an agreement never to sue PetroEcuador or its filial companies in exchange for official state support of the plaintiffs in the *Aguinda v. Texaco* lawsuit.

(Bass et al. 2010). The Reserve also is home to the Waorani and Kichwa, as well as two other indigenous groups who live in voluntary isolation, the Tagaeri and the Taromenane. However, the park is located on top of an estimated 20% of Ecuador's oil reserves and parts of it have been under development from oil since 1980s. The Ishpingo-Tambococha-Tiputini block, located in the far eastern corner, is the most remote, intact area of the Yasuní Reserve.

In response to growing international concern over climate change and loss of biodiversity, President Correa introduced a proposal to protect the ITT in 2007. The initiative proposed a sort of distributive environmental justice that would address historic disparities between the north and the south in the contemporary global environmental crisis. Leaving oil in the ground would prevent 410 million metric tons of carbon dioxide from entering the atmosphere (Larrea 2009), and was hailed by supporters as a way to prioritize social and environmental values. Correa argued that the initiative was a model mechanism by which developed nations could take responsibility for global warming, allowing other mega-diverse developing nations with fossil reserves – such as Colombia, the Democratic Republic of the Congo, and India – to follow suit (Larrea and Warnars 2009). The initiative proposed to combat global warming by committing not to extract hydrocarbons located in areas of high biological value and cultural sensitivity, thereby protecting the indigenous peoples living within the park, and contributing to social development and environmental conservation by promoting sustainability.

In August 2013, however, Correa announced that since only \$13.3 million had been raised over the course of 6 years from donors such as Spain, Germany, and Italy, he was terminating the Initiative. For Correa, the failure of the Yasuní-ITT proposal indexed the moral failing of developed nations. “The world has failed us,” Correa announced on 15 August 2013.

“It wasn’t charity that we asked for. It was *co-responsibility* in the struggle against climate change ... But, let’s not fool ourselves. The fundamental factor of the failure is that the world is hypocritical. And the logic that prevails is not one of justice, but the logic of power” (Correa 2013). Noting that it was one of the most difficult decisions of his administration, he opened the ITT for drilling that same year.<sup>2</sup> The operations, Correa said, would generate an estimated \$18 billion over 30 years that would allow for sovereign development and bring the nation out of poverty. The decision to open the ITT fit within Correa’s legacy of technocratic populism that has promoted extraction as a form of rational development for the nation.

In his speech announcing the plan’s failure, President Correa assured the public that by using appropriate techniques, oil drilling would affect less than one percent of the National Park. Just minutes later, Correa corrected his statement, saying that he had misspoken and meant to say that less than one per thousandth of the park – “*menos del uno por mil*” – would be affected (Telegrafo). This phrase referred to the estimated 10km<sup>2</sup> (1000 hectares) of the park that would be directly affected by the drilling. Correa never mentioned how this number was calculated. However, some suggested that it was plausibly arrived at via an Environmental Impact Assessment of the state-run PetroAmazonas’ operations in the adjacent oil Block 31 (Hill 2013).

Quantification practices constitute some of our most basic understandings of society and the environment (Urla 1993), such as the measures of untapped value of the Amazon or the density of species biodiversity in the ITT. Numbers allow potential barrels of oil, and by extension, future revenue, to be made tangible when counted and estimated. Numbers are also

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<sup>2</sup> Founded in 1989, the UN declared Yasuní National Park a biosphere reserve in 1989. Currently a Spanish company and two Chinese companies operate in the park, extracting tens of thousands of barrels per day (K 2014a).

mobilized as they are here to signify the state's technical capacity to control and respond to the highly risky business of extracting oil. As shown in Chapter 4, potential environmental impacts are circumscribed prior to implementation through their calculation in *el uno por mil*—despite an extensive historical record that suggests the impossibility of such control. Like the oil floating under the booms after a spill, oil always seeps our efforts to contain it.

But beyond indicating the state's technical capacity to manage oil extraction responsibly, large numbers are routinely invoked to suggest oil's promise—through estimates of barrels underground (which range from 700 to 950 million barrels in the ITT reserve) or through the petrodollars with which the government promises to fund educations, build bridges and schools, and 'end poverty' (Rival 2010). These numbers emerge out of expert domains of calculation—from economics to geology. While an estimate of 950 million barrels of oil is based on various (un)certain predictions of what lies beneath Amazonian soils, it is rendered fact when mobilized in political debates and presidential speeches, and is translated to other realms of value. Easy jumps are made between unknown quantities of unproduced underground oil to the fulfillment of political promise in the concrete forms of infrastructure and jobs or the abstract statements about progress or future good.

Numbers allow the commensuration of value. Scientists and activists were quick to critique the *uno por mil* calculation, pointing to the ways in which risks from operations are difficult to anticipate or control. Others argued that the calculation was meaningless in a place of planetary diversity. Such an estimate, still others noted, only accounts for direct impacts such as well platform areas, and not the indirect (and difficult to anticipate) effects of spills, noise, and settlement. As anyone who has visited the Amazon knows, oil operations never occur in isolation—they are accompanied by a flurry of other processes that effect widespread social and

environmental changes. Yet, in summarizing the potential environmental impact as *el uno por mil*, one hectare in the Amazon is made equivalent to one hectare anywhere else. The calculation flattens the particular value of the ITT – as both a place and as an ideal – which initially inspired the Initiative.

Numbers are potent political tools of persuasion (Poovey 1998). Intertwined with expert domains, quantification can give the illusion that individual judgment has been eclipsed in the standardization of specific techniques of calculation (Porter 1996). The use of calculations to delimit future impacts points us to the essential role of numbers in governance of oil operations; numbers are the means by which EIAs proceed, the currency through which the state verifies if companies are in compliance or not with Regulation 1215, and the economic justification for the state's decision to drill. Part of what is at stake in *el uno por mil* is that the calculation synthesizes concepts as complex and contentious as harm, contamination, or risk; the numerical object circulates as merely a reflection of reality while erasing how it was made. Like the practices of calculating Impacts in EIAs, crucial decisions about what will count as harm from oil are masked when *el uno por mil* is used to justify decisions of environmental governance.

Many Ecuadorians saw the Yasuní-ITT proposal as an emblematic step towards preserving one last portion of the Amazon, combatting climate change, and imagining a future in which Ecuador did not depend on oil. Following the termination of the proposal, student and activist groups filled the Plaza Grande of Quito, calling for a moment of silence for the loss of the Yasuní. Phrases such as *La Amazonía es Vida* (*The Amazon is life*) and *Vida o Petróleo* (*Life or Oil*) filled the streets. Long time environmental activist groups that had been behind the initiative – including Acción Ecológica, Pachamama, and an growing student-led group called the Yasunidos (combining the Spanish words for 'Yasuní' and 'united') – began to organize a

signature campaign calling for a national referendum on exploiting the ITT. Critics suggested that the government had always planned to extract the oil in the Yasuní-ITT in what had been described as “Plan B” (to proceed with exploitation should “Plan A,” conservation, fail). In subsequent months, newspapers alleged that Ecuador had negotiated with a Chinese bank in 2009 for a secret \$1 billion deal to drill in the Yasuní (The Guardian 2014; Hill 2014). The sincerity of Correa’s support of the initiative was roundly questioned.

Correa launched the *Mano Sucia* campaign at Aguarico-4 just one month after the announcement that the Yasuní-ITT would be opened to drilling. The campaign could not have come at a more cogently strategic moment. The *Mano Sucia* campaign offered an opportunity for Correa to reclaim an international image as an environmentalist leader. Paid for by the National Secretariat of Communications of Ecuador, *Mano Sucia* constituted a charismatic means to refocus critique of extraction on Chevron’s past in the Amazon, and away from the Yasuní.

In the months following this event, campaigns were launched in European cities such as Paris and Moscow, in which individuals could take their picture standing next to a life-size image of President Correa with their own gloved hand extended, blackened with mock crude. Such images could be uploaded to the *La Mano Sucia* website (<http://www.lamanosucia.com>). In Canada, Bolivia, and India, individuals stamped their inked hands onto large banners to show their support. Images of blackened hands circulated as well on social media sites, with captions such as “the hand of truth” and hashtags (#justicia, #LaManoSuciaDeChevron) in solidarity with the campaign to condemn Chevron.

The campaign transformed an Amazonian waste pit into an object of international concern. It asserted that harm from drilling is not isolated to the crude waste upon which the President or subsequent celebrities stood, but is profoundly connected to the webs of

transnational capital and environmental activism. The inaugural moment of the campaign articulated Correa as the protector of the nation, poised to confront the legacies of imperialism and power that accompanied foreign corporations' operations in the global south. Within the campaign, the health of the Amazon as a natural body became proxy for health of the nation; the Amazon was made visible as a natural body at risk from extraction. The crude oil left in Amazonian waste pits was mobilized as proof of how asymmetrical power relations and exploitation between the global north and south were manifest in Ecuador.

The dirty hand indicates that the bearer has been to the site, has seen and felt the stickiness of the crude, in order to present himself – via his hand – as a faithful witness. Yet, something shifted in the dirty hand when Correa began his *Mano Sucia* campaign. The campaign interpolated the hand in transnational networks to a new degree. Bringing in celebrity after celebrity to show a dirtied hand in solidarity transformed outsiders into witnesses of a crime committed by a corporation – in many cases, a corporation from their own country, and a crime about which they had only recently come to know. Instead of speaking from intimate experience of contamination, in these performances celebrities came to realize, the gravity of the situation. The dirty hand demonstrated their media solidarity with a charismatic president. Yet, rather than highlighting their proximity to contamination, instead the gesture underlined their physical and political distance from it.<sup>3</sup> The embodied nature of the oiled hand demands an intimate knowledge of the politics of place and the impact of exposure to toxins. To bear witness to something that one has not lived does not carry the same authority as to bear witness from a place of personal articulation. What the oiled hand makes evident then, depends on its bearer.

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<sup>3</sup> My intention in describing these tensions in the spectacle of the *Mano Sucia* campaign is not to destabilize international advocacy work on oil extraction and the environment in Ecuador. I would like to be clear that I fully support comprehensive remediation of contamination in the Amazon as well as efforts to imagine futures that are not dependent on fossil fuels.

## *Justifications*

The double work of the hand in the *La Mano Sucia* campaign following the Yasuní-ITT initiative was not lost on the public. In one cartoon, the top frame showed a caricatured Correa standing in an oil pit, defiantly holding out his hand in solidarity – “I dirty my hands” [“Me mancho las manos”]. In the frame below, Correa washes his hands in a pool of water from the Yasuní – “I wash my hands” [“Me lavo las manos”]. The image suggests that the President claims to have clean hands when it comes to the Yasuní; he washes himself of responsibility for the Initiative’s failure or the ecological harm drilling will inevitably bring. Playing on the duality of the hands, in another cartoon a male figure, likely Correa, faces an audience, his right hand prominently outstretched to denounce Chevron, while his left hand – also blackened by crude – is held hidden behind his back. The image suggests that the political ‘left’ is being disingenuous with their involvement in oil development, despite their proclaimed environmentalist politics. The cartoons emphasize the obvious double standard of critiquing Chevron while ignoring the poor environmental record of state oil operations, and Correa’s role in opening the Yasuní-ITT to drilling.

For many, Correa’s launch of *La Mano Sucia* on the heels of his announcement of the end of the Yasuní-ITT initiative illustrated his contradictory posture on environmental protection and extraction, as well as the tensions between his technocratic and messianic forms of leadership (de la Torre 2011; de la Torre 2013). Correa is known internationally as a left-leaning environmentalist governing a country that boasts a progressive constitution guaranteeing the rights of nature. Across South America, his administration is part of a growing trend of leftist leaning, progressive governments that came to power through alliances with social and Indigenous movements. These governments have critiqued the neoliberal development common



in Latin America in the 1980s and 1990s by denouncing export dependency, enclave economies, and the power of foreign companies (Gudynas 2009). In Ecuador, Correa made a commitment to increased social investment in the form of free education, new roads, and to fight poverty through the “citizen’s revolution” of his Alianza País political party. Yet, despite such changes, extraction has remained a principle source of revenue for progressive states, and has expanded to include new sectors (e.g., mining in the southern Andes).

Correa’s decision to open the Yasuní-ITT exemplifies his administration’s promotion of extraction alongside natural protection within a disavowal of global power asymmetries. In his speech announcing the decision, he denounced the environmental community for creating a false dichotomy between preservation of the Yasuní and the extraction of oil. He argued that there was no contradiction in his decision:

They have deceived us with a false dilemma – all or nothing. The exploitation of the Yasuní or the survival of the Yasuní. This false dilemma is part of an even bigger false dilemma: nature or extractivism.

The real dilemma, he went on to argue, is “100% of the Yasuní and no resources to satisfy the urgent needs of our people, or 99% of the Yasuní intact and \$18 billion to overcome poverty – especially in the Amazon, paradoxically the region with the highest incidence of poverty,” (August 15, 2013). Environmental priorities, Correa insisted, must be balanced by the reality of the “pathologies of poverty,” such as cholera, dengue, and the lack of basic services that continue to plague Ecuador.

Many of the initiative’s supporters in Ecuador were not convinced. In the months following the announcement, civil society and activist groups organized events, filled the streets of Quito and other cities with marches, and began a signature campaign to bring the decision to drill in the ITT to national referendum. One of the most prominent groups, the Yasunidos, argued

that there is no such thing as ‘clean extraction,’ insisting that the Yasuní-ITT is more precious than any profits oil might bring. Protestors countered government claims of minimal impact, holding signs that declared that damaging even 1% of the world’s lungs would be fatal, drawing on a common analogy that treats the Amazonian rainforest as the lungs of the world because of its capacity to sequester carbon.

Following 6 months of mobilization led by the Yasunidos, Acción Ecológica, and Pachamama, the signatures calling for a referendum were brought to the National Electoral Commission (CNE) of the national government in Quito. After revision, the CNE declined approximately two-thirds of the 800,000 signatures, citing repeats, missing copies of identification cards, smudges, or incorrect paper thickness (K 2014b; K 2014a; Constante 2014). The remaining ‘valid’ signatures did not meet the minimum number to require a referendum. Organizers argued that democratic process had been denied and denounced the CNE – and the Correa government by extension – as corrupt.

Protests ensued. In public display of dissent, protestors made giant mock signature forms, upon which they stamped their blackened hands. Across the bottom of the forms the Yausnidos indicted the Correa government with its own phrase, replacing “Chevron” with “CNE”: “*La mano sucia del CNE*” (“*The dirty hand of the CNE*”) read the signs. The dirty hand had been appropriated once again, this time to accuse the government in stifling democracy in favor of oil.

### ***Erosion of the commitment***

Let’s return to the opening moment of the campaign at the Aguarico-4 pit. The young man who was brought out by the environmental ministers to indicate the boundaries of the pit to President Correa did not see himself as playing a central role in the *Mano Sucia* launch. Born at

the end of the 1990s, he has spent his entire life living near the oil wells and pipelines that surround Lago Agrio. When called to walk across the pit, he stopped and dipped his hand into the crude. Although he was following the President's lead, the act of putting his bare hand in crude oil was not remarkable for him – people living in this region routinely encounter crude oil in waste pits and spills. But this moment proved critical to the *La Mano Sucia* campaign. In doing so – no glove to cover his hand and without hesitation – he called upon the President to prove his commitment to the cause he had just proclaimed. In other words, *he forced Correa's hand.*

The *Mano Sucia* campaign was an unprecedented display of political commitment in the history of struggles over oil and environmental cleanup in the Amazon. His oiled hand asserted that the President of the Republic was willing to expose his own body to toxic hydrocarbons, bridging the symbolic and spatial difference of the distribution of pollution through the gesture. Yet, this bare commitment also complicated the campaign, aside from serving as a media stunt. Shouts from the audience called for the President and the young man to shake their black hands. The young man moved forward, stepping up to balance on the log alongside Correa. Their mutual denunciation was affirmed through their crude handshake. While in light of the *Mano Sucia* campaign the gesture solidified Correa's commitment to the Amazonian cause for justice in *Aguinda*, it also served to highlight the dual work performed by his other hand in opening the Yasuní-ITT to drilling – ultimately revealing the shakiness of his public commitment and the fragility of his moral claim of Chevron's wrongdoing.

Central to movement, perception, and meaning, the hand is a fundamental mediator through which we engage and experience the world. Hands have long been linked to questions of

morality, such that the hand is often figured in relation to the self (Hertz 1973).<sup>4</sup> People living in oil-production regions of the Amazon have been, and continue to be, routinely exposed to oil and its by-products. When Donald or other representatives of the FDA present their oiled hands on toxic tours, their gestures index intimate knowledge of the effects of pollution. The oiled hand offers a critique of power and the unequal distribution of waste that structures oil as a path to development, figured through an embodied commitment of individuals whose lives are tangled with industrial waste.

In Ecuador, extraction has been reframed for national development at the same historical moment that nature has been accorded constitutional rights, and in which one of the largest environmental lawsuits ever brought found a US-based oil company guilty of damages worth \$8.6 billion. The launch of the *Mano Sucia* campaign just a month following the termination of the Yasuni-ITT proposal illuminates the ongoing tensions present in the making of harm. Such

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<sup>4</sup> Hands carry a multiplicity of meanings, far too many to include here. A frequent semantic trope, the hand is a literal or figurative extension of the self, *at the hands of* suggests that it was by or through one's hands that something happened. Biblical and literary sources abound with references in which the self is in relation to the hand, in particular in which the cleanliness of hands is akin to morality and responsibility (e.g. Psalm 24:4), or when Pontius Pilate washed his hands to absolve himself of the execution of Jesus. Likewise, we can recall Macbeth's inability to wash the blood from his hands after killing King Duncan, the imaginary bloodstains a metaphor for his guilty conscience. In Spanish, the phrase '*lavarse las manos*' ('to wash one's hands') is invoked for a politician who was party to an illicit activity and sought to hide or cover up his involvement. Hands leave traces; one might imagine a fine wooden desk that betrays the hands of the master who made it, or a crook caught by telltale fingerprints left at the scene of the hoist. Our hands bear witness to the events of our lives. Central to such conceptions is the link between the hands and personal investment. To indicate that something was made *by hand* suggests that it is a genuine product or testament. The hands infer immediate knowledge or proximity to a situation; *hands-on* experience lends legitimacy to claims, suggesting a type of expertise or testimony that can only be gained through direct involvement. Investment and experience can imply solidarity, such that to walk *hand in hand* is to accompany, support, or travel together. Yet, hands – despite being markers of intention – can also be deceptive. The puppet master gives the effect of the marionette dancing by manipulating the almost invisible strings with his hands. The magician, through a *sleight of hand*, manipulates objects to fool the audience with her quick fingers.

concerns are clearly not limited to the *Aguinda* lawsuit or to oil operations in the past, but remain issues of pressing global significance. The oiled hand gestures to relations between north and south, between oil companies and the places where they operate, between bodies and hydrocarbons. It points to asymmetrical burdens of contamination and the complicity of each of us in the continuation of extraction. Correa's use of the *el uno por mil* as his technical justification for ending the Yasuní-ITT initiative suggests what is at stake in the rationalized practices used in environmental regulation and scientific assessment. Where activists insist on drawing relations between prior company practices and the present, Correa sought to enclose the consequences of oil production within a numerical calculation to suggest their manageability, and ultimately, their insignificance.

## CONCLUSIONS

Two graduate students in journalism have arrived from Colombia University to investigate the operations of Chinese oil companies in the Amazon. Following a recommendation from an environmental activist they interviewed in Quito, they arranged for a Toxic Tour with Donald. Given their focus on Chinese companies, Donald had specially tailored the day's itinerary to their interests.

Driving into Block 14, home to the operations of the Chinese-owned Andes Petroleum company, Donald directs the driver to stop at a bluff overlooking the road. We cross over wooden boards propped against the pipeline to form a makeshift bridge, following a well-worn path to the home of the current community president, Carlos. The community is in the middle of conflicts with the oil company. The situation is tense: there are rumors that some families have been paid to report back to company officials about individuals who are critical of the operations. A month prior, after consistent problems with oil spills and failed negotiations with the company, some residents held a strike and blocked the entrance of machinery to a nearby well. As a result, the company filed a lawsuit against the president for sabotage. Unsurprisingly, Carlos was wary about speaking to the group on the matter.

Seated on his front porch on a red plastic chair, Carlos recounted for the journalists the ongoing problems. According to him, the company had deliberately incited internal conflict in order to proceed with drilling. During this time, the streams had been contaminated and neighbors, as well as farm animals, were made sick. Further discontent was sown when the

limited positions for employment in a new project were allocated to some families and not others. Meanwhile the company, he notes, denies responsibility for these problems.

The journalists ask to see the contaminated stream, and the well where the most recent standoff was held. Taken aback, Carlos says he can't accompany the group to the sites because the company has security crews. In addition, he fears his neighbors might report on him. The interview ends abruptly. Back in the van, one of the journalists is frustrated. *It's just his word*, he says. *Just his word, there's no proof. They say the stream is contaminated, but they won't take us to see it. How do we know?*

Following the visit with Carlos, the tour proceeded to visit additional communities where people were living along side visibly leaking waste pit. These are scenes that are similar to those that have been described throughout this text: the journalists dug their heels into the banks of streams and watched as mud fell into the water, leaving an oily sheen in its wake; they spoke to farmers who told of poisoned fish in the rivers; they took pictures of the gas flares. Yet the pair was unmoved – where were the new spills, the gushing pipelines, or the flaming waste pits? In other words, where was the *disaster*?

At the end of the day, I sat under fluorescent glow of lampposts talking to a friend in Lago Agrio who had also been along on the trip for the day. The journalists' disappointment was disconcerting to both of us. What the pair had encountered in the Amazon evidently did not match the imaginary they had prior to arrival. Their desire for more pollution, more proof, more spectacle was telling. How bad, I wondered out loud, does contamination need to be before one is convinced? *This*, my friend responded blandly, *the desire to see pollution or to catch people in the act of polluting – it's a desire to consume the obscene.*

The *Aguinda* case has made the issue of oil in Ecuador famous. The lawsuit has framed many of the conversations I had with interlocutors; it is impossible to tell the history of oil in this region without addressing the case. Images of celebrities denouncing Texaco, forearms dripping with crude silhouetted against the glow of a gas flare, accompanied by claims of an “Amazon Chernobyl” have shaped public expectations of what oil disaster looks like. While such images – as well as the rhetoric that accompanies them – have sparked outrage and inspired activist organizing, they also have crafted a specific depiction of oil disaster. As we have seen in this text, the dispersion of chemicals through soil and water and air is not only about technical questions of how to measure hydrocarbons, but raises questions of representation, historical standards, and responsibility. Daily life involves exposures to chemicals that are residual and accumulative, confounding methods for tracking toxic burden. Regulatory measures must divide their assessment of the effects of potential operations on environments to such a degree of specificity as to lose sight of the larger impact of extraction. As I have shown through these examples, harm comes in many forms – and not all of them have the viscous, tell tale black sheen of crude.

My intention has been to shift focus away from the spectacular to the quotidian in order to write an ethnography of harm in the everyday. I believe that accounts of the mundane are more attentive to life in this place, and ultimately, more relevant to evaluating the contemporary controversies over extraction in different sites across the globe. If we only look for the egregious – whether discharge tubes openly flushing oily waste into rivers, or burst pipelines spraying oil on the surrounding landscape – we miss the daily, insidious, and differentiated ways that oil production is changing lives in the Amazon. We also miss the ways that people continue to live alongside operations. By attending to various interventions into the matter of harm, I have sought



to show that what we call ‘harm’ from oil emerges and is given form in a highly contested terrain. In doing so, I show why answering the question of ‘what harm is’ has proved so difficult – both over the course of the *Aguinda* case and in debates over the future of oil for the Ecuadorian state.

By investigating the issue of harm, I have sought to query the matter. Throughout the text, harm shifts between things that one can point to (contamination from a waste pit, the recounting of a miscarriage) and things that are more uncertain (respiratory distress? gastrointestinal problems? cancer? deforestation? downstream contamination?). Despite my intellectual commitments to understanding harm as in part undetermined, there is a desire to be able to say – with certainty – that harm from oil production is unequivocally *this* and not *that*. My experiences of living in the region push through the text, and at times I shift into a voice in which is more certain than doubting. Such tensions indicate my own iterative process of grappling with the movements between field and text, argument and experience. I believe that such moments of tension can be productive. I hope that this text will contribute to the opening up, rather than closing down, of conversations about the consequences of extraction.

Finally, by questioning standard narratives that presume that harm is already known, I would like to reiterate that my intention has not been to evaluate, in a normative sense, the accounts of those interlocutors who shared their stories with me. Rather, I aim to show the tensions between the voices of residents, experts, and officials as they make claims about what harm is in different forums. I believe that this is a worthwhile venture; by not assuming that we already know where harm from extraction begins and ends, we can be more attentive to harms that are excluded from official accounts or public discourse when debating the costs and benefits of extractive projects – in Ecuador and beyond.

The uncertain bears heavily on the issue of harm. Harm materializes differently through each of the interventions followed in this text, seeping past our efforts to contain it. Harm takes form through the measuring of soil samples, the probing of a stick, the recounting of a spill, or the revealing of a lesion on the body, yet it is not reducible to any singular object or event. A central argument that has run through this text is that in order to understand the nature of harm we must attend to the particularity of toxic relations in *this* place. This necessitates a close understanding of daily life, of history, and of the relations through which people, places, and chemicals are drawn into association. The controversies over the extent to which harm oil production causes harm cannot be reduced to political or economic interests; nor is this a battle of truth versus fiction. To put it simply, more tests and better tools will not solve the problem. Yet, the question remains: if harm is at once diffuse and localized, identifiable yet fundamentally undetermined, how would one move to redressing it?

By way of concluding, I turn here to the book *Hyperobjects*, in which Timothy Morton (2013) shows how attention to entities that are massively distributed in time and space like plutonium particles, oil fields, and global warming can serve as an impetus to rethink all objects and our relations to them. He argues that an object like global warming is made up of many smaller objects: of raindrops and atmospheric gases, ice cores and historic temperature plots. It consistently confounds the instruments we use to measure it. Yet in spite of this inability to access global warming – to grasp all of it at once or to map its effects with absolute certainty – it is no less real.

In his concluding chapters, Morton takes up a hyperobject that has been the principle site of this text, the Lago Agrio oil fields. Referencing *Aguinda v. Texaco*, he describes how

hydrocarbons from oil fields have leached into drinking water and resulted in a plethora of health problems. Yet, doubt abounds. Oil companies like Chevron, he notes, dispute the facts of contamination in order to eschew responsibility. Endless reams of data are produced on the uncertainty inherent to toxicity. Causal claims about oil and its effects on health and ecology are difficult to sustain. Such an infinite quest for data, he contends, is a form of denial used to stall action. Capricious hydrocarbons trump our ability to track them, muck up our vision, and act in ways we cannot fully account for or predict with measuring devices. Yet it is precisely because we cannot ever see, map, or document such objects in their entirety that precaution must be the guiding principle. Instead of narrow conceptions of scientific causality or an imperative to know completely, Morton calls for action in the face of the unknown.

Following Morton, if harm is an unsettled matter, this doesn't mean that we can't work to do something about it. To intervene for a better life. To do extraction differently, or not extract at all. We need not know something entirely – as though that were possible – in order to work towards a more inclusive understanding of accountability for corporate, state, and personal decisions around energy extraction and use, or for a public commitment to remediating damaged environments in places of extraction. By acknowledging the limits of all of our tools – from laboratory tests to aerial images, from soil core samples to life histories and archival documents – for tracking toxic chemicals in environments, determining exposures over lifetimes, or assigning responsibility for damages, I aim to show that a lack of certainty in matters involving harm cannot justify inaction. Diverse practices lend harm shape, cut its boundaries, draw some connections and obscure others. Such interventions are world-making activities. These practices have effects to which we must be attentive and for which we must be responsible: they reveal the

relations that sustain and endanger each of our lives – individually, collectively, unequally – in connivance with oil.

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